INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/10672

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	NO,A 14,095 (NIELSEN) 15 May 1905, Figures 1-3	1, 2, 4-9
Y		3

ACCO Brands
Exhibit 1002 Part 2 - '758 FH
ACCO Brands v. Think Products
IPR2015-01167

Back to list

1-1/1 Next page From 1 - 1 Count

Display format: ---------- Select the Type of Output ----------

Display checked documents

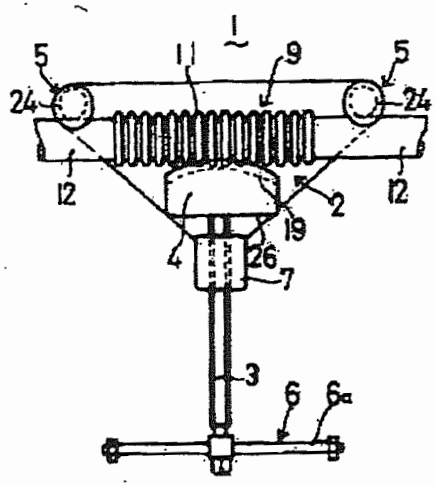
Check All Uncheck All

☐ ** Result [P] ** Format(P803) 2005.12.06 1/ 1

Application No./Date: 1998-317757[1998/11/ 9]
Public Disclosure No./Date: 2000-140948 Translate [2000/ 5/23]
Registration No./Date: [ ]
Examined Publication Date (present law): [ ]
Examined Publication No./Date (old law): [ ]
PCT Application No.:
PCT Publication No./Date: [ ]
Preliminary Examination: ()
Priority Country/Date/No.: ( ) [ ] ( )
Domestic Priority: [ ] ( )
Date of Request for Examination: [2005/ 9/29]
Accelerated Examination: ( )
Kind of Application: (0000)
Critical Date of Publication: [1998/11/ 9]( )
No. of Claims: (5)
Applicant: MAEZAWA KYUSO INDUSTRIES CO LTD
Inventor: OGINO SHINJI
IPC: B21D 7/06
FI: B21D 7/06 B
F-Term: 4E063AA04,AA20,BC19,JA10,MA30
Expanded Classicication: 125
Fixed Keyword:
Citation: [, . . ,] (, ,)
Title of Invention: CORRUGATED TUBE BENDING DEVICE

Abstract: PROBLEM TO BE SOLVED: To provide a corrugated tube bending devic e which is easy in carriage, compact in structure, capable of easily and rap idly folding a corrugated tube to a desired folding angle without any specia l skill, and easy in correction in a mistaken folding. SOLUTION: Tube receiv ing rolls 5, 5 are pivotably supported by both edges of a bottom side of a t

riangular base 2, and a nut-like member 7 to which a multiple threaded part 3 is screwed is fixed to a part of its apex. A piece 4 is connected to a for ward end of the multiple threaded part 3. A corrugated tube 9 which is a wor k to be folded is inserted between the tube receiving rolls 5, 5 and the pie ce 4, and a handle 6 is turned to bend the corrugated pipe 9 by the pressure of the piece 4. The desired bending can be easily achieved by displaying an angle mark on the base 2 and advancing the piece 4 to this position. Excess ive folding can be corrected making use of a corrugated tube bending device
1.COPYRIGHT: (C)2000,JPO



Relation to Original Application: ( )
Original Application No.: ( )
Original Registration No.: ( )
Retroactive Date: [ ]
Assignment/License: ( )
Classification of Examiners Decision/Date:
() [ ]
Final Examinational Transaction/Date:
( ) [ ]

Kind of Examination: (01)
Examination Intermediate Record:
(A63 1998/11/ 9,PATENT APPLICATIONUTILITY MODEL REGISTRATION APPLICATION, 2
1000:)
(A961 1998/11/13,CORRECTION DATA BY EX OFFICIO (FORMALITY), :)
(A621 2005/ 9/29,WRITTEN REQUEST FOR EXAMINATION, 94300:)

*** Trial No./Date: [ ]
Kind of Trial: [ ] ***
Demandant: -
Defendand: -
Opponent: -
No. of Opposition in Effect: ( )
No. of Opposition Claims: ( )( )
Classification of Trial Decision of Opposition/Date:
( ) [ ]
Final Disposition of Trial or Appeal/Date:
( ) [ ]
Trial and Opposition Intermediate Record:

Registration Intermediate Record:

Amount of Annuity Payment: ( )
Extinction of Right/Lapse Date of Right:
()[ ].
Closed Register Filing Date: [ ]
Proprietor: -
Status of Register: ( )

Other Drawing

Check All | Uncheck All

Display checked documents

Display format ---------- Select the Type of Output ----------

1-1/1 Next page From 1 - 1 Count

Back to list

(19)日本国特許庁（ＪＰ）　(12) 公開特許公報（Ａ）　(11)特許出願公開番号
特開2000－140948
（P2000－140948A）
(43)公開日　平成12年５月23日(2000.5.23)

(51)Int.Cl.'	識別記号	ＦＩ		テーマコード'（参考）
Ｂ２１Ｄ　7/06		Ｂ２１Ｄ　7/06	Ｂ	４Ｅ０６３

審査請求　未請求　請求項の数５　ＯＬ　（全５頁）

(21)出願番号　特願平10－317757

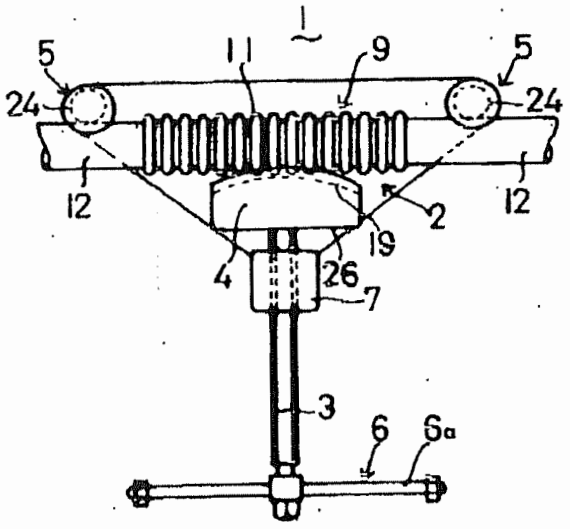
(22)出願日　平成10年11月９日(1998.11.9)

(71)出願人　000201593
前澤給装工業株式会社
東京都目黒区鷹番２丁目13番５号
(72)発明者　荻野　真二
埼玉県幸手市惣新旧50/2番地　前澤給装工業株式会社内
(74)代理人　100092336
弁理士　鈴木　晴敏

Ｆターム(参考)　4E063 AA04 AA20 BC19 JA10 MA30

(54)【発明の名称】　波状管曲げ装置

(57)【要約】
【課題】　持ち運び容易なコンパクトの構造からなり、波状管を所望の折り曲げ角度に特別な熱練を要することなく容易に、且つ迅速に折り曲げできると共に、折り曲げミス時における矯正が容易にできる波状管曲げ装置を提供する。
【解決手段】　三角形状のベース台２の底辺の両縁には管受けロール５，５が枢支され、その頂角の部位には多重ねじ部３の螺合するナット状部材７が固定される。多重ねじ部３の前端にはコマ４が連結される。管受けロール５，５とコマ４間に被折り曲げ体の波状管９を挿入し、ハンドル６を回転することによりコマ４の押圧力により波状管９は曲げられる。なお、ベース台２には角度マークが表示されコマ４をこの位置まで進めることにより所望の折り曲げが簡単に行われる。また、折り曲げ過ぎも本発明の波状管曲げ装置１を利用して修正できる。



EX 1002 - Page 1 of 9

【特許請求の範囲】

【請求項１】　適宜間隔で波状部を形成する波状管を所望の角度に折り曲げるための曲げ装置であって、ベース台と、該ベース台上の中心部に固定されるナット状部材と、該ナット状部材に螺合する多重ねじ部と、該多重ねじの先端に連結され前記波状管よりも軟質の材料からなるコマと、前記ベース台上の端縁側に枢支され、前記コマの位置を中心として左右対象位置に配設され前記波状管よりも軟質の材料からなる管受けロールと、前記多重ねじ部に着離可能に連結され該多重ねじ部を回転させるハンドルとを備え、前記コマと前記管受けロールとの間には被曲げ材である前記波状管の挿入可能な間隙が形成されることを特徴とする波状管曲げ装置。

【請求項２】　前記コマの前記波状管の当接部位には波状管の半径よりも大きな曲率半径のＲ面が形成され、前記ロールの前記波状管の当接面は前記波状管の外面に２箇所で接触する略円錐面に形成されることを特徴とする波状管曲げ装置。

【請求項３】　前記ベース台上には、前記管受けロールに両端支持され前記波状部に前記コマを当接してその当接部を中心として折り曲げられる前記波状管の折り曲げ角度を表示する角度マークが設けられることを特徴とする請求項１に記載の波状管曲げ装置。

【請求項４】　前記コマには矯正板が着脱可能に連結され、該矯正板は、その一端側を前記コマに連結され、他端側には折り曲げ部が形成され、前記折り曲げ部は、前記管受けロールの前記コマ側から離れた側に当接して配置される折り曲げ済の前記波状管の前記波状部に係着可能な形状に形成されることを特徴とする請求項１に記載の波状管曲げ装置。

【請求項５】　前記多重ねじ部の前記ハンドルの取り付けられる部位には、棒体状のハンドルの貫通する貫通孔及び／又はレンチの頭部の係合する係合部が形成されることを特徴とする請求項１に記載の波状管曲げ装置。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、波状管の曲げ装置に係り、特に、比較的太径の波状管を容易に、且つ高精度に曲げることができ、且つ曲げ矯正も可能な波状管曲げ装置に関する。

【０００２】

【従来の技術】図６，図７に示すように波状管９は多数の突出部１０からなるヂャバラ状の波状部１１を適宜間隔で一直線状に多数個配設する管体からなり、例えば、ステンレス材等の金属管からなる。その呼び径は一般に２０乃至５０位のものが水道用管体としては使用される。なお、呼び径２０の波状管９は図７におけるｄ寸法が２２ｍｍ位のものからなり、呼び径５０のものは４９ｍｍ位のものからなる。図６に示すように、隣接する波状部１１，１１間には直管部１２が形成される。なお、波状管９の肉厚は１ｍｍ乃至１．２ｍｍである。

【０００３】

【発明が解決しようとする課題】図６に示すように、多くの波状部１１を配設する波状管９は、例えば、管路１３の分水栓１４に一端を連結し、他端を使用場所側に連結する必要があり、図示のように途中で曲げる必要がある。この折り曲げは波状部１１を中心として適宜角度波状管９を曲げて行う。従来技術では波状管９を折り曲げるには手と膝を用いたり柱を利用したりして行っていた。このため折り曲げ角度が不正確になり易く、且つ折り曲げ作業に多くの時間と労力を必要とする問題点があった。また、仮りに折り曲げが失敗した場合、この矯正が簡単にできない。また、折り曲げ時に波状管９を傷付ける問題点もある。更に、所望の角度に一度に折り曲げることが難しく、折り曲げ作業を複数回行って所望の形状にする作業が必要であり、作業性が悪い。

【０００４】本発明は、以上の問題点を解決するもので、特別な熟練を要することなく所望の角度の折り曲げが簡単に、且つ効率的にでき、管体への傷付きもなく、折り曲げ失敗時における矯正が容易にできる波状管曲げ装置を提供することを目的とする。

【０００５】

【課題を解決するための手段】本発明は、以上の目的を達成するために、適宜間隔で波状部を形成する波状管を所望の角度に折り曲げるための曲げ装置であって、ベース台と、該ベース台上の中心部に固定されるナット状部材と、該ナット状部材に螺合する多重ねじ部と、該多重ねじの先端に連結され前記波状管よりも軟質の材料からなるコマと、前記ベース台上の端縁側に枢支され、前記コマの位置を中心として左右対象位置に配設され前記波状管よりも軟質の材料からなる管受けロールと、前記多重ねじ部に着離可能に連結され該多重ねじ部を回転させるハンドルとを備え、前記コマと前記管受けロールとの間には被曲げ材である前記波状管の挿入可能な間隙が形成される波状管曲げ装置を構成するものである。更に具体的に、前記コマの前記波状管の当接部位には波状管の半径よりも大きな曲率半径のＲ面が形成され、前記ロールの前記波状管の当接面は前記波状管の外面に２箇所で接触する略円錐面に形成されることを特徴とする。また、前記ベース台上には、前記管受けロールに両端支持され前記波状部に前記コマを当接してその当接部を中心として折り曲げられる前記波状管の折り曲げ角度を表示する角度マークが設けられることを特徴とする。また、前記コマには矯正板が着脱可能に連結され、該矯正板は、その一端側を前記コマに連結され、他端側には折り曲げ部が形成され、前記折り曲げ部は、前記管受けロールの前記コマ側から離れた側に当接して配置される折り曲げ済の前記波状管の前記波状部に係着可能な形状に形成されることを特徴とする。また、前記多重ねじ部の前記ハンドルの取り付けられる部位には、棒体状のハンド

ルの貫通する貫通孔及び／又はレンチの頭部の係合する係合部が形成されることを特徴とするものである。

【０００６】折り曲げ前の波状管を管受けロールとコマとの間に挿入し、管受けロールで波状管の直管部を受けると共に直管部間の波状部のほぼ中心にコマの先端を当てる。この状態で多重ねじ部に係着されたハンドルを操作することによりベース台に固定されるナット状部状に螺合する多重ねじ部が前進し、波状管は波状部を中心として折り曲げられる。ベース台上には折り曲げ角度を表示する角度マークが設けられ、コマの位置を角度マークと対応させることにより波状管は所望の角度に曲げられる。なお、管受けロールやコマは波状管よりも軟質な材料からなり、当接部にはR面が形成されているため波状管は傷が付くことなく円滑に、且つ容易に曲げられる。

【０００７】また、仮りに所望の角度に波状管が曲げられなかった場合には、折り曲げ済の波状管を管受けロールの外側に当て、コマに連結された矯正板を用いて折り曲げ前の状態に簡単に復帰させることができ、再度所定の折り曲げを行って所望の折り曲げ管を形成することができる。

【０００８】

【発明の実施の形態】以下、本発明の波状管曲げ装置の実施の形態を図面を参照して詳述する。図１及び図２は本発明の波状管曲げ装置１の全体構造を示す。波状管曲げ装置１は大別してベース台２と、多重ねじ部３と、コマ４と、一対の管受けロール５，５と、ハンドル６と、多重ねじ部３の螺合するナット状部材７等とからなる。なお、ベース台２上には角度マーク８が表示される。

【０００９】ベース台２は本実施の形態では三角形状の平板からなる。ベース台２の三角形の頂角の部位にはナット状部材７が固着される。図２に示すように、ナット状部材７はベース台２上に固定されるナット状部材本体１５と、これに嵌着されるリードスクリュ１６等とからなる。なお、リードスクリュ１６には多重ねじが螺刻される。また、リードスクリュ１６はナット状部材本体１５に対しロックねじ17により固定される。このリードスクリュ１６には多重ねじ部３が螺合して装着される。

【００１０】コマ４は図１に示すように曲率半径ｒの凸円弧部１８を前端側に形成するブロック体からなり、その前端側の内面には波状管９の波状部１１の当接するＲ面１９が形成される。なお、凸円弧部１８の曲率半径ｒは波状管９の直径の３倍程度のものからなり、Ｒ面１９の半径ｒ１（図２）は波状管９の波状部１１の半径よりも大きな寸法からなる。コマ４の後端側には穴２０が形成され、穴２０内には多重ねじ部３の先端が挿入される。この先端には縮径部２１が形成される。また、穴２０の奥底には座金２２が挿着され多重ねじ部３の先端をスラスト支持する。また、コマ４に螺着されたボルト２３はその先端を多重ねじ部３の縮径部２１に挿入し、多重ねじ部３の軸線方向の移動を拘束すると共にこれを回転可能に保持する。

【００１１】管受けロール５は三角形状のベース台２の底辺の両端の部位に設けられベース台２に枢支される。管受けロール５は鼓状のものからなり、中間部には波状管９の直管部１２の当接係合するＲ面２４が形成される。なお、この略円錐面２４は図２に示すように波状管９の外周を２点で受け波状管９の保持の安定化を図っている。コマ４及び管受けロール５はそのＲ面１９，略円錐面２４で波状管９を直接保持するため波状管９に傷を付け易い。そのため、本実施の形態ではステンレス鋼からなる波状管９よりも軽質のアルミニウム材からなる。

【００１２】角度マーク８は本発明の波状管曲げ装置１で折り曲げられる波状管９の折り曲げ角度の目安となる表示マーク２５からなり、図示では３０°乃至９０°の目盛からなる。なお、目盛は波状管９の呼び径に対応して表示される。即ち、コマ４の凸円弧部１８の反対側（後端側）には直線状の基準面２６が形成され、この基準面２６と表示マーク２５が合わさる位置までコマ４を進めることによりその呼び径の波状管９の折り曲げ角度が決められる。

【００１３】図１，図２に示すように多重ねじ部３の後端には棒体状ハンドル６ａの挿入される貫通孔２７が形成されると共に図略のレンチの頭部の角状孔の嵌まり込む係合部である角状頭部２８が形成される。

【００１４】次に、本発明の波状管曲げ装置１を用いて波状管９を所望の折り曲げ角度に曲げる方法を説明する。図３に示すように、管受けロール５とコマ４との間の空間内に波状管９を挿入し、その波状部１１の中心とコマ４の中心を一致させる。これにより、波状部１１の中心は多重ねじ部３の軸線上にくる。ハンドル６を回転し、コマ４の凸円弧部１８、詳しくはそのＲ面１９を波状部１１に当接し、多重ねじ部３を回転することにより波状管９は管受けロール５側に押圧され、その直管部１２が管受けロール５，５の略円錐面２４のイ，ロ（図２）に当る。

【００１５】次に、図４に示すように、ハンドル６を更に回転させてコマ４を前進させると波状管９は波状部１１の中心を基点として図示のように折り曲げられる。前記したようにベース台２上には角度マーク８が表示されているため、この角度マーク８と、コマ４の基準面２６が一致するまでコマ４を進めることにより角度マーク８と合致する折り曲げ角度に波状管９は折り曲げられる。以下、同様の動作を繰返し行うことにより図６に示すように波状管９の各部が所望の折り曲げ角度により折り曲げ成形される。以上の動作は、単に波状管９を所定位置にセットした後に多重ねじ部３を回転してコマ４を所定位置まで前進させればよく、特別な熟練を必要とせず、誰でもが容易に、且つ迅速にできる。なお、以上の作業は波状管曲げ装置１を地面において行ってもよいが作業がやりにくい。そこで図８に示すようなパイプバイス２

９を用いる。パイプバイス２９は上下方向に移動する押圧具３１と不動側のＶブロック３０とこれ等を地面上より適宜の高さに保持するための脚３２等からなる。即ち、現場での作業は、図９に示すようにこの波状管曲げ装置１をパイプバイス２９により挟持することによりより安定性のある作業が行われる。また、図３に示した棒状体ハンドル６ａの替りにレンチ（図略）を角状頭部２８に嵌め込むことにより多重ねじ部３の回転がより迅速に、且つ容易にできる。

【００１６】前記したように、波状管９の折り曲げはコマ４の基準面２６を角度マーク８に一致させればよいが、場合により合わせ間違い等のミスにより波状管９を折り曲げ過ぎたりする不具合が生じる。この場合は、本発明の波状管曲げ装置１を用いることによりその矯正が簡単にできる。矯正時には図５に示すようにコマ４に矯正板３３を取り付ける。この矯正板３３は平板状のものからなり、その一端側はコマ４にピン３４により連結されると共に他端側には折り曲げ部３５が形成される。なお、折り曲げ部３５は波状管９の波状部１１に係着し得る形状からなる。まず、図５に示すように間違って折り曲げられた波状管９の直管部１２の内側を管受けロール５，５の外方側に当てる。この状態でコマ４を前進させ、矯正板３３の折り曲げ部３５を波状部１１に係着させる。次に、多重ねじ部３を逆回転しコマ４を戻し方向に移動させると波状管９は次第に真直状態に復帰する。適当な真直状態に復帰したら前記した折り曲げ動作を再び行い、波状管９を所定の折り曲げ角度に曲げればよい。なお、図示の矯正板３３は波状部１１に点接触するような形状のものからなるが、勿論、これに限定するものではなく、例えば、当接面を弧面状に形成するものでもよい。

【００１７】

【発明の効果】１）本発明の請求項１に記載の波状管曲げ装置によれば、波状管を所定位置にセットし、コマと管受けロール間に波状管を挟持した状態で多重ねじ部をハンドルで回転してコマを前進させるだけの簡単な動作により波状管の折り曲げが特別な熟練を要することなく容易に、且つ迅速に行われる。また、波状管曲げ装置はコンパクトな構造からなり、現場への持ち運びが容易にできる。

２）本発明の請求項２に記載の波状管曲げ装置によれば、波状管はコマのＲ面とロールの略円錐面により安定、且つ確実に保持されるため円滑で、正確な折り曲げ作業が行われる。

３）本発明の請求項３に記載の波状管曲げ装置によれば、コマの位置を角度マークに合致させることにより、波状管の折り曲げ角度を所望のものにすることができ、正確な折り曲げが容易にできる。

４）本発明の請求項４に記載の波状管曲げ装置によれば、波状管の折り曲げ過ぎが生じても簡単に矯正することができる。

５）本発明の請求項５に記載の波状管曲げ装置によれば、多重ねじ部には各種形状のハンドルが着脱可能に装着され、運送時にハンドルが邪魔にならないと共に目的に応じて所望のハンドルを使用することができる。

【図面の簡単な説明】

【図１】本発明の波状管曲げ装置の全体構造を示す平面図。

【図２】図１の側面図。

【図３】本発明の波状管曲げ装置による波状管の折り曲げ作業を説明するための平面図。

【図４】本発明の波状管曲げ装置による波状管の折り曲げ状態を示す部分平面図。

【図５】本発明の波状管曲げ装置を用いた波状管の矯正方法を説明するための部分平面図。

【図６】波状管の使用時の折り曲げ形状の一例を示す平面図。

【図７】波状管の詳細構造を示す拡大軸断面。

【図８】従来一般に使用されているパイプバイスの模式図。

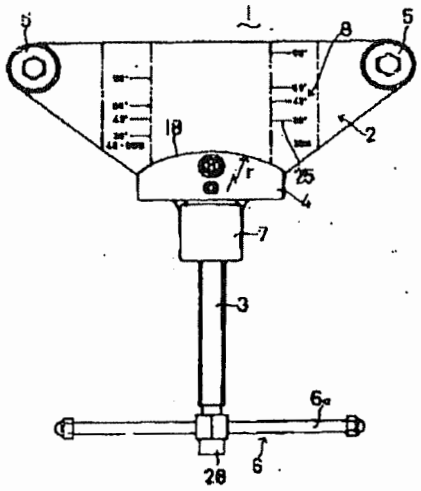
【図９】パイプバイスを用いた管の折り曲げ方法を説明するための模式図。

【符号の説明】

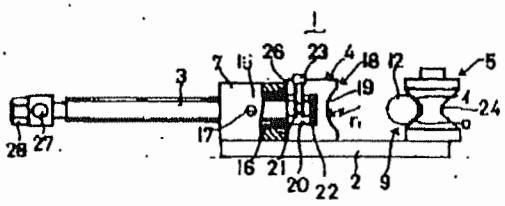
１　波状管曲げ装置
２　ベース台
３　多重ねじ部
４　コマ
５　管受けロール
６　ハンドル
６ａ　棒状体ハンドル
７　ナット状部材
８　角度マーク
９　波状管
１０　突出部
１１　波状部
１２　直管部
１３　管路
１４　分水栓
１５　ナット状部材本体
１６　リードスクリュ
１７　ロックねじ
１８　凸円弧部
１９　Ｒ面
２０　穴
２１　縮径部
２２　座金
２３　ボルト
２４　略円錐面
２５　表示マーク
２６　基準面

27 貫通孔
28 角状頭部
33 矯正板
34 ピン
35 折り曲げ部

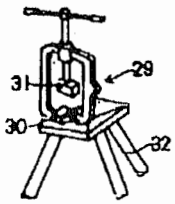
【図1】



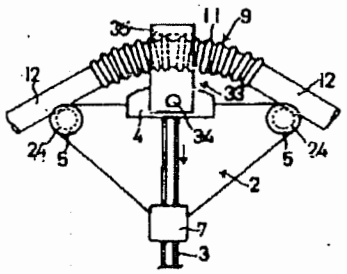
【図2】



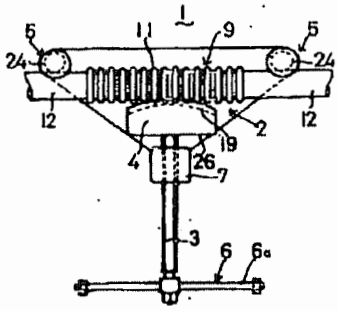
【図8】



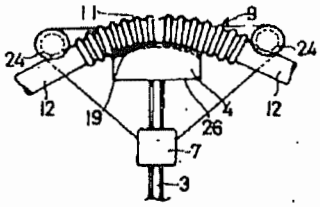
【図5】



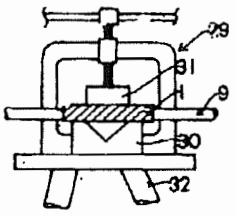
【図3】



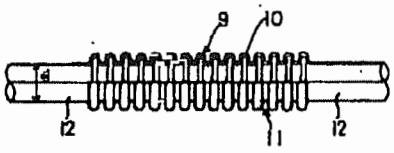
【図4】



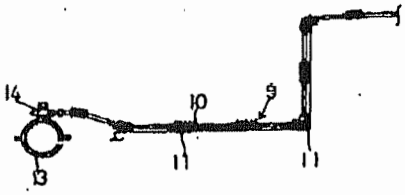
【図9】



【図7】



【図6】



Patent nr. 14095.

Bekjendtgjørelse fra patentkommissionen.

Stængeindretning for laase (portierlaas).

Grosserer Ingwald Nielsen af Christiania.

(Fuldmægtig: Ingenier Alfred J. Bryn, Christiania).

Patent i Norge fra 11te november 1904.

JUN 29 1905

Opfindelsen gaar ud paa en portierlaas af den slags, der fastholdes i nøglehullet ved hjælp af en laas f. eks. en hængelaas, men som i modsætning til de nu benyttede laase af denne slags kan trækkes ud og sættes ind nøglehullet fra samme side af døren.

En udførelsesform for opfindelsen er fremstillet paa hosføiede tegning, der viser indretningen i forskjellige stillinger.

Indretningen bestaar af to i forhold til hinanden dreibare arme a, som ved den ene ende er forsynet med næser eller fremspringende hager b. Disse hager er anordnede saaledes, at de, naar armene falder sammen eller over hinanden, springer frem fra armene i modsatte retninger, saaledes at de danner et bredt tværstykke (fig. 3).

Paa den modsatte side af omdreiningspunktet c er armene forsynet med huller d for anbringelse af en hængelaas e. Disse huller dækker hinanden, naar armene dækker hinanden.

Naar armene svinges i en saadan stilling, at deres næser eller hager b dækker hinanden kan indretningen let stikkes ind i nøglehullet (se fig. 2). Ved sammenlægning af armene svinges hagerne ud i modsat retning, og naar saa hængelaasen anbringes i hullerne, er derved en tilbagetrækning af indretningen umuliggjort.

I det viste eksempel er hængelaasen anbragt bagenfor det punkt, om hvilket armene svinger i forhold til hinanden, men det er indlysende, at laasen ogsaa kan anbringes foran dette punkt.

Patentkrav:

Stængeindretning for laase, (portierlaas), bestemt til at anbringes i nøglehullet, bestaaende af to i forhold til hinanden svingbare arme, hvis forreste ender paa modsatte kanter er forsynede med fremspring, der i en bestemt ved hjælp af en laas (f. eks. hængelaas) sikret indbyrdes stilling af armene, hindrer indretningen fra at trækkes tilbage.

8 — 18267

Offentliggjort i „Norsk Patentblad" nr. 20 for 15de mai 1905.

Oscar Andersens bogtrykkeri. Kristiania.

BEST AVAILABLE COPY

BEST AVAILABLE COPY

Fig. 1.

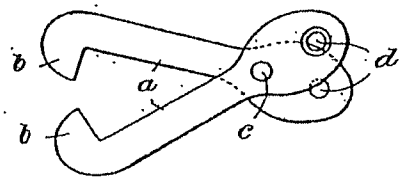


Fig. 2.

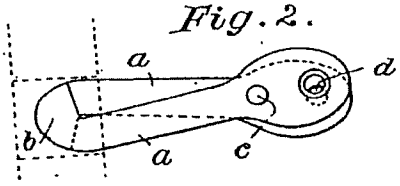
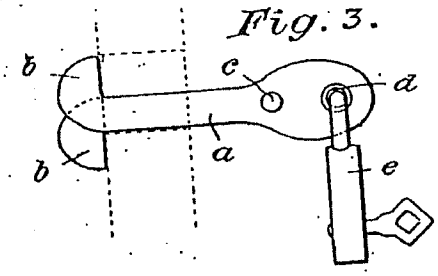


Fig. 3.



PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 4 : F41C 17/00 — A1

(11) International Publication Number: WO 86/ 00396

(43) International Publication Date: 16 January 1986 (16.01.86)

(21) International Application Number: PCT/GB85/00238

(22) International Filing Date: 5 June 1985 (05.06.85)

(31) Priority Application Numbers: 8415818, 8430954

(32) Priority Dates: 21 June 1984 (21.06.84), 7 December 1984 (07.12.84)

(33) Priority Country: GB

(71) Applicant *(for all designated States except US)*: WATERGLADE PRODUCTS (UK) LIMITED [GB/GB]; Stafford Road, Darlaston, West Midlands WS10 8UA (GB).

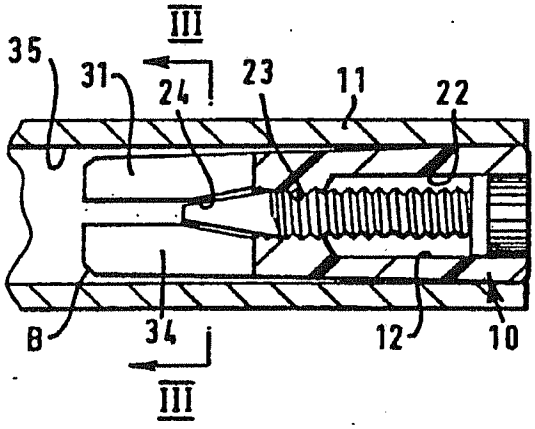
(72) Inventor; and
(75) Inventor/Applicant *(for US only)* : BEARE, Charles [GB/GB]; 7 Millfields Way, Wombourne, Wolverhampton, West Midlands WS10 8UA (GB).

(74) Agent: FORRESTER, KETLEY & CO.; Rutland House, 148 Edmund Street, Birmingham B3 2LD (GB).

(81) Designated States: AT (European patent), BE (European patent), CH (European patent), DE (European patent), FR (European patent), GB, GB (European patent), IT (European patent), LU (European patent), NL (European patent), SE (European patent), US.

Published
With international search report.

(54) Title: FIREARM SAFETY LOCK



(57) Abstract

A device for disabling a gun comprising a generally cylindrical member (10) having an external diameter approximately the same as the internal bore (35) of a barrel (11) of the gun into which the device is inserted, means (10, 15; 15', 15'') to expand the member (10) over at least a part of its length into tight frictional engagement with the internal wall (35) of the barrel (11), to prevent withdrawal of the device.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GA	Gabon	MR	Mauritania
AU	Australia	GB	United Kingdom	MW	Malawi
BB	Barbados	HU	Hungary	NL	Netherlands
BE	Belgium	IT	Italy	NO	Norway
BG	Bulgaria	JP	Japan	RO	Romania
BR	Brazil	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic			SE	Sweden
CG	Congo	KR	Republic of Korea	SN	Senegal
CH	Switzerland	LI	Liechtenstein	SU	Soviet Union
CM	Cameroon	LK	Sri Lanka	TD	Chad
DE	Germany, Federal Republic of	LU	Luxembourg	TG	Togo
DK	Denmark	MC	Monaco	US	United States of America
FI	Finland	MG	Madagascar		
FR	France	ML	Mali		

Title: Firearm safety lock

This invention relates to a device for disabling a gun, and more particularly but not exclusively, to a device for disabling a shot gun, although the device may be used to disable any gun into the barrel of which the device may be inserted.

By "disabling a gun" we mean that the gun is prevented from being loaded with a cartridge and hence prevented from being fired.

According to the invention, we provide a device for disabling a gun comprising a generally cylindrical member having an external diameter approximately the same as the internal bore of a barrel of the gun into which the device is inserted, means to expand the member over at least a part of its length into tight frictional engagement with the internal wall of the barrel, to prevent withdrawal of the device.

Thus, before the barrel can be loaded with a cartridge, it is necessary to release the frictional engagement of the device with the barrel so that said device can be withdrawn.

Preferably the member is made in a plastics material such as Nylon 6 which is a relatively soft material compared with the barrel, so that upon insertion or withdrawal of the device, and as the device is expanded, there is no risk of scratching the inside surface of the barrel or otherwise damaging the barrel.

The means to expand the device may comprise an expansion element received in an internal hollow of the member, the expansion element having an engagement surface which is urged into increasingly tight engagement with an internal engagement surface of the hollow, as the expansion element is rotated to expand the member. For example, the expansion element may have a screw thread, and a tapered nose portion, and the hollow of the member may have a receiving part to receive the screw thread in engagement therewith, and a tapered surface corresponding to the tapered surface of the member, whereby as the element is rotated, the tapered nose

portion moves along the hollow by virtue of the engaging screw thread and receiving part, into engagement with the tapered surface of the hollow to thus expand the member. The receiving part may be screw threaded to receive the screw thread of the expansion element.

The cylindrical member preferably has an axial through opening from one end into which the expansion element is inserted, to the other end which, in use, lies innermost of the end of the barrel into which the device is inserted, the opening at said other end of the member being too small to permit the expansion element to pass therethrough, so that as the expansion element moves along the opening as it is rotated, the member adjacent said other end will be urged outwardly.

Thus at least part of the axial through opening comprises the hollow. The member may have one or more axial slots at said other end extending from the cylindrical surface to the axial opening, to provide fingers which are urged outwardly as the expansion element is rotated.

Preferably, at least four such fingers are provided by two pairs of slits, the slits of each pair extending from the axial opening in opposite directions.

Said other end of the member, which provides a leading end as the device is inserted into the barrel, may have a bevelled edge to facilitate insertion of the device.

The expansion element may have provided in an outermost end thereof, one or more slots or projections to engage with a tool, such as a screwdriver, to facilitate insertion and rotation of the expansion element in the through opening. Alternatively, said outermost end of the expansion element may have a formation which can only be engaged by a special tool, so that the device cannot be removed from the barrel by any person not having the special tool.

For example, the outermost end of the expansion element may have a formation such as a splined formation, which is engageable within a receiving formation of a special tool to enable the expansion element to be rotated.

The outermost end of the expansion element may have projecting longitudinally therefrom, a striking element which may be spring biased outwardly, or otherwise resilient, which striking element will enable a firing pin or hammer of the gun to be released with the disabling device in position, without risk of damaging the firing pin or hammer. Thus the disabling device would more closely resemble a live cartridge.

Preferably the member is slightly conical. The larger diameter end may be said one end, so that the device at said one end is a tight fit in the barrel, to prevent the device moving along the barrel from the end thereof, and to hold the member as the expansion element is initially rotated against rotation relative to the barrel.

According to a second aspect of the invention, we provide a special tool for use with the device according to the first aspect of the invention, the tool comprising a shank having on one end thereof, a receiving formation to engage with the formation at said outermost end of the device.

The invention will now be described with the aid of the accompanying drawings, wherein:-

FIGURE 1 is an exploded perspective view of a first embodiment of a device in accordance with the invention;

FIGURE 2 is a cross-section through the device of Figure 1, taken on the line 2-2 of Figure 1, shown assembled and received in the end of a barrel of a shot gun.

FIGURE 3 is an end view of the device of Figure 2 in the shot gun barrel;

FIGURE 4 is a side view of an alternative expansion element for use in the device of Figures 1 to 3;

FIGURE 5 is a side view of a special tool for use with the element of Figure 4.

FIGURE 6 is a view similar to Figure 4 of a further expansion element for use in a device in accordance with the invention.

Referring to figures 1 to 3 of the drawings, a device for disabling a shot gun comprises a member 10 made of a plastics material such as Nylon 6 or any other material which is relatively soft compared with the barrel 11 of a shot gun. The member 10 has an axial through opening 12 which opens from one end 13 to the other 14, the through opening 12 receiving, in use, an expansion element 15 which when inserted into the through-opening 12 and rotated, causes the member 10 to expand, as hereinafter described.

The expansion element 15 comprises a generally truncated nose portion 17, a middle part 18 on which a screw thread 19 is formed, and a head portion 20 which has a receiving formation 21 for an Allen key, to facilitate rotation of the member 15. Of course, any other formation such as a projection, to engage with a special tool could be provided, or even a simple slot or slots for engagement by a screwdriver. An alternative formation comprising a

projection is shown in Figure 4 and the corresponding special tool is shown in Figure 5, described hereinafter.

The tapered nose portion 17 comprises an engagement surface, which engages with a corresponding engagement surface within the opening 12 of the member 10.

Referring particularly to Figure 2, the member 10 is shown inserted in the end of a barrel 11 of the shot gun, before the expansion element has been rotated to expand the member. It can be seen that the through-opening 12 comprises an initial section 22 having a diameter large enough to accommodate the head 20 of the expansion element 15, a female threaded receiving part 23 with which, in use, the screw thread 19 of the expansion element 15 engages so that as the element 15 is rotated, the nose portion 17 is drawn axially along the opening 12 of the member 10 into engagement with a tapered surface 24 of the opening 12 which provides the further engagement surface.

The section 22, receiving part 23 and tapered surface, together provide a hollow which receives the expansion element.

The end 14 of the member is provided with four slits 25, 26, 27 and 28 which extend from the through opening 12 to the outer cylindrical surface 30 of the member, the slits 25 to 28 thus providing four fingers 31, 32, 33 and 34.

As the expansion element 15 moves to the left, as seen in Figure 2, so that the nose portion 17 engages the tapered engagement surface 24 of the opening 12, the fingers 31, 32, 33 and 34 will thus be urged outwardly into tight frictional engagement with the bore 35 of the barrel 11. Thus the member 10 will be prevented from being withdrawn.

The member 10 which is generally cylindrical, is slightly conical having a minimum diameter at end 14, and a maximum diameter at end 13. The maximum diameter of the end 13 is preferably, the same as the internal diameter of the bore 35 of the barrel 11 so that as the member 10 is inserted, there is frictional engagement between the member 10 at end 13, and the barrel, so that the member does not slide along the barrel from the end thereof, but remains adjacent the end thereof, where the expansion element 15 is readily accessible and so that the member 10 prevents a cartridge being loaded into the barrel.

Further, as the expansion element 15 is initially rotated, this frictional engagement will prevent the member 10 turning in the barrel 11. The taper is exaggerated in Figure 2 for clarity.

The leading end of the nose portion 17 is bevelled as shown at B, to facilitate initial insertion of the member 10.

Referring to Figure 4, an alternative expansion element 15' is shown. This has a nose portion 17' and middle part 18' with screw thread 19' similar to the corresponding parts of the expansion element 15 of Figures 1 to 3 but the body of the element 15' is broader.

However, in place of a receiving formation in a head portion, a formation comprising a splined projection P is provided, which is adapted to be engaged by a special tool having a corresponding receiving formation.

Such a tool is shown at 40 in Figure 5, which comprises a shank 41, in one end 42 of which a receiving formation 43 corresponding to projection P is provided. The other end is provided with an opening 44 which receives a transverse bar 45 for assisting leverage.

Referring now to figure 6, a still further expansion element 15" is shown for use with a plastics member similar to member 10 shown in figures 1 to 3. Again, the expansion element 15" has a nose portion 17", a middle part 18", with a screw thread 19" similar to expansion element 15 of figures 1 to 3.

The body is slightly narrower than that of the expansion element 15 of figures 1 to 3 and has at an end 50 thereof, a splined portion P". The diameter of the portion P" is slightly narrower than the diameter of the opening 12 of the member 10 (see figure 2). Thus sufficient clearance is provided for a tool, such as that shown at 40 in figure 5, but with a suitably dimensioned and shaped internal recessing formation, to be inserted in the opening 12 of the member 10 with the splined portion P" of expansion element 15" received in a corresponding portion 43 of the tool.

The expansion element 15" has a further modification, namely a bore 51 in the end 50 thereof which extends through the splined portion P" and into the remainder of the body of member 15". The bore 51 receives a striking element 52 comprising a larger diameter part 53 received in bore 51, and a smaller diameter part 54 which projects from the end of the expansion element 15". The striking element 52 is biased outwardly by a spring 55 received in the bore 51 and is prevented from moving outwardly of the expansion element 15" beyond the position shown by a shoulder 56 between parts 53 and 54 of the element 52, and a corresponding step 57 of a bore 51.

During manufacture, the striking element 52 would be positioned by separating the splined portion P" from the remainder of the body and

thereafter releasably or permanently connecting the splined portion P" of the remainder of the body together.

If desired, instead of a spring biased striking element 52 as described, any other resilient element may be provided in the position shown. Thus when the device is received in a barrel of a gun, the firing pin or hammer of the gun can be released without risk of damage to the firing pin or hammer. Further, because the firing pin or hammer can be released without risk of damage, the disabling device with the striking element 52 would closely resemble a live cartridge in the firing action of the gun.

Many modifications are of course possible without departing from the scope of the invention.

Although as described, an expansion element 15, 15' or 15" with a screw thread 19, 19', 19" is provided to expand the member 10 into tight frictional engagement with the barrel 11, any other means may be provided.

Furthermore, it is not essential to provide four fingers, such as the fingers 31, 32, 33 and 34, separated by slits 25, 26, 27 and 28, but more or less than four fingers may be provided.

The receiving part 23 with which the screw thread 19, 19' or 19" of the expansion element 15, 15' or 15" engages, need not itself be screw threaded, but as the material of the member 10 is soft, the screw thread 19, 19', 19" may cut its own way to provide a thread, as it is rotated.

In each case, as the material of the member 10 is soft, over-tightening will merely result in damage to the thread on the receiving part 23 and not damage to the barrel 11.

As the member 10 is generally cylindrical, and is expanded uniformly outwardly as described, there will be no tendency for the barrel 11 to distort during tightening.

It will be appreciated that the device described provides a safety device for disabling a shot gun or any other gun having a barrel into which the device may be inserted, to prevent the gun being loaded with a live cartridge, for example by children, and inadvertently fired.

The features disclosed in the foregoing description, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

CLAIMS

1. A device for disabling a gun comprising a generally cylindrical member (10) having an external diameter approximately the same as the internal bore (35) of a barrel (11) of the gun into which the device is inserted, means (10,15;15';15") to expand the member (10) over at least a part of its length into tight frictional engagement with the internal wall (35) of the barrel (11), to prevent withdrawal of the device.

2. A device according to claim 1 characterised in that the means to expand the device comprise an expansion element (15;15';15") received in an internal hollow (22,23) of the member (10), the expansion element (15;15';15") having an engagement surface (17) which is urged into increasingly tight engagement with an internal engagement surface of the hollow (22,23), as the expansion element (15;15';15") is rotated to expand the member (10).

3. A device according to claim 2 characterised in that the expansion element (15;15';15") has a screw thread (19;19';19") and a tapered nose portion (17;17';17") and the hollow of the member (10) has a receiving part (23) to receive the screw thread (19;19';19") in engagement therewith, and a tapered surface (24) corresponding to the tapered surface (17;17';17") of the member, whereby as the element (15;15';15") is rotated, the tapered nose portion (17;17';17") moves along the hollow by virtue of the engaging screw thread (19;19';19") and receiving part (23) into engagement with the tapered surface (24) of the hollow to thus expand the member (10).

4. A device according to claim 3 characterised in that the receiving part (23) is screw threaded to receive the screw thread (19;19';19") of the expansion element (15;15';15").

5. A device according to any one of claims 2 to 4 characterised in that the cylindrical member (10) has an axial through-opening (12) from one end (13) into which the expansion element (15;15';15") is inserted, to the other end (14) which, in use, lies innermost of the end of the barrel (11) into which the device is inserted, the opening (12) at said other end (14) of the member (10)

being too small to permit the expansion element (15;15';15") to pass therethrough , so that as the expansion element (15;15';15") moves along the opening (12) as it is rotated, the member (10) adjacent said other end (14) will be urged outwardly.

6. A device according to claim 5 characterised in that the member (10) has one or more axial slots (25,26,27,28) at said other end (14) extending from the cylindrical surface (30) to the axial opening (12) to provide fingers (31,32,33,34) which are urged outwardly as the expansion element (15) is rotated.

7. A device according to any one of claims 2 to 6 characterised in that the outermost end (50) of the expansion element (15';15") has a formation ($P;P^1$) which is engageable within a receiving formation (43) of a special tool (40) to enable the expansion element (15';15") to be rotated.

8. A device according to any one of claims 2 to 7 characterised in that the outermost end (50) of the expansion element (15") has projecting longitudinally therefrom, a resilient striking element (52).

9. A device according to any one of the preceding claims characterised in that the member (10) is slightly conical.

10. A special tool (40) for use with the device of any one of claims 1 to 9 characterised in that the tool (40) comprises a shank (41) having on one end thereof (42), a receiving formation (43) to engage with the formation ($P;P^1$) at said outermost end of the expansion element (15';15").

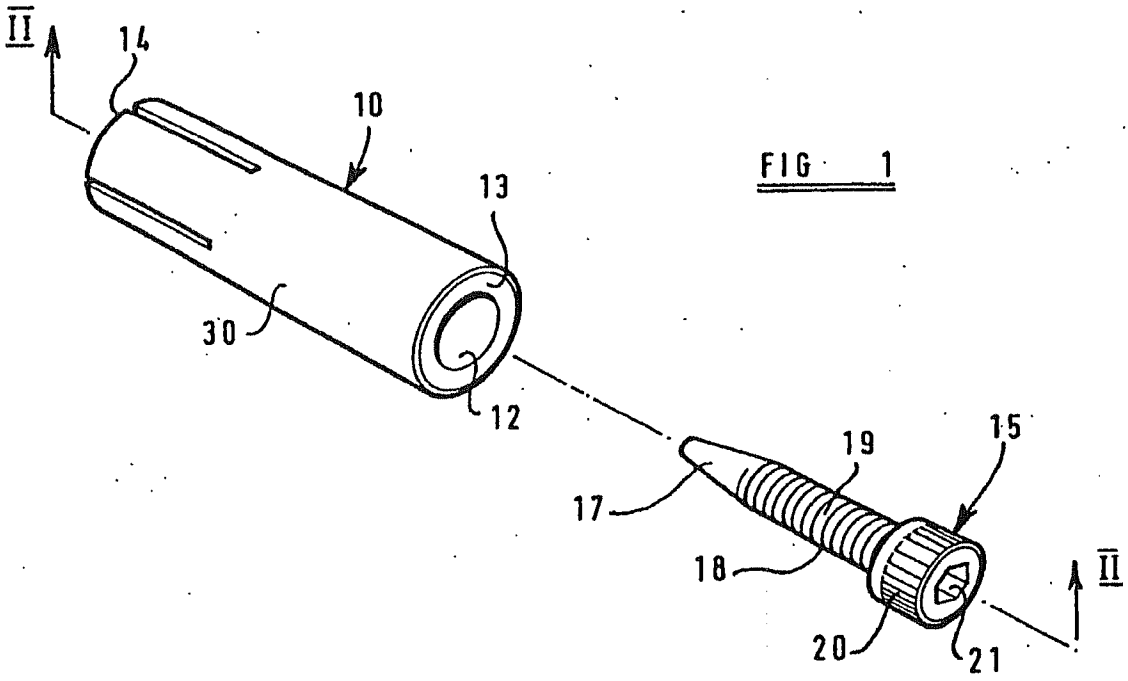


FIG 1

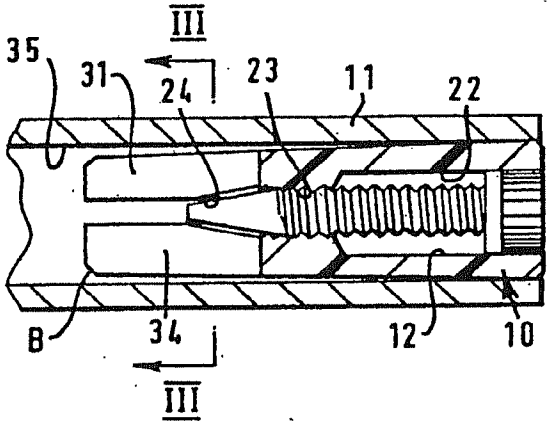


FIG 2

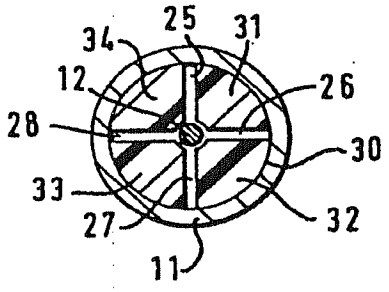


FIG 3

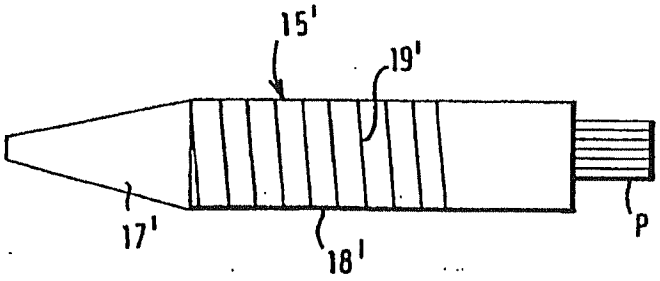


FIG 4

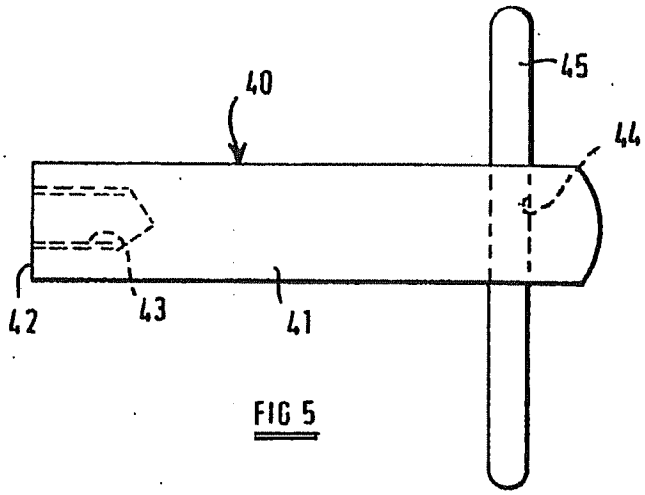


FIG 5

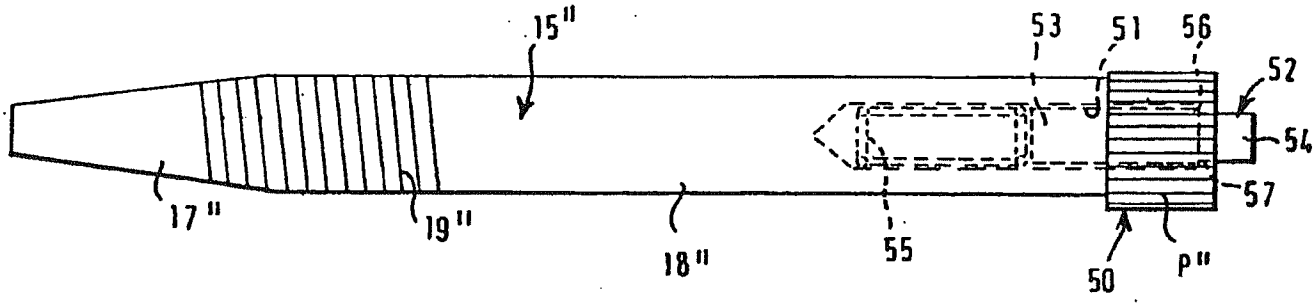


FIG 6

INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 85/00238

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC[4]: F 41 C 17/00

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC[4]	F 41 C

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category [10]	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
X	US, A, 2530560 (YOUNG) 21 November 1950, see column 2, lines 15-55 and column 3, lines 1-21; figures 1-10	1-7,9-10
X	US, A, 3154874 (STEWART) 3 November 1964, see the whole document	1-7,10
X	US, A, 2836918 (PULA) 3 June 1958, see the whole document	1-7,10

[10] Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
18th July 1985	20 AOUT 1985
International Searching Authority	**Signature of Authorized Officer**
EUROPEAN PATENT OFFICE	G.L.M. Kruydenberg

Form PCT/ISA/210 (second sheet) (January 1985)

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON

INTERNATIONAL APPLICATION NO. PCT/GB 85/00238 (SA 9832)

This Annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 09/08/85

The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A- 2530560		None	
US-A- 3154874		None	
US-A- 2836918		None	

For more details about this annex :
see Official Journal of the European Patent Office, No. 12/82

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : E05B 73/00 | A1

(11) International Publication Number: WO 93/15295

(43) International Publication Date: 5 August 1993 (05.08.93)

(21) International Application Number: PCT/US93/00423

(22) International Filing Date: 20 January 1993 (20.01.93)

(30) Priority data:
07/824,964 24 January 1992 (24.01.92) US

(71) Applicant *(for all designated States except US)*: KENSINGTON MICROWARE LIMITED [US/US]; 2855 Campus Drive, San Mateo, CA 94403 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)* : CARL, Stewart, R. [US/US]; 533 Addison, Palo Alto, CA 94306 (US). ZARNOWITZ, Arthur, H. [US/US]; 1249 Capuchino Avenue, #2, Burlingame, CA 94010 (US). MYERS, Gary, L. [US/US]; 3000 North River Road, River Grove, IL 60171 (US).

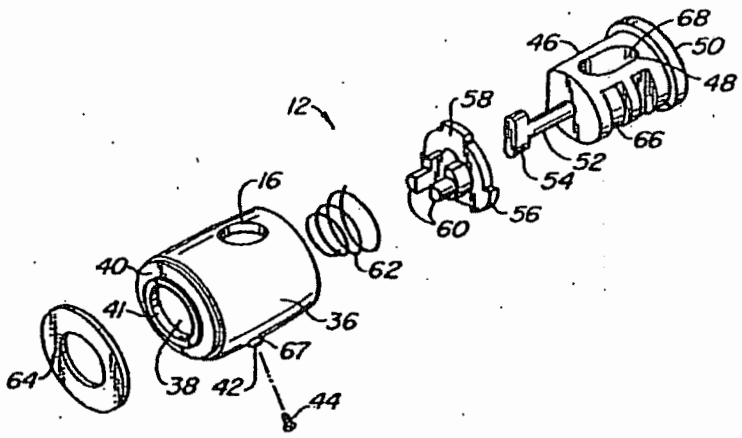
(74) Agents: SCHWAB, George, M. et al.; Townsend and Townsend Khourie and Crew, Steuart Street Tower, 20th Floor, One Market Plaza, San Francisco, CA 94105 (US).

(81) Designated States: AT, AU, BB, BG, BR, CA, CH, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, LK, LU, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, SN, TD, TG).

Published
With international search report.

BEST AVAILABLE COPY

(54) Title: COMPUTER PHYSICAL SECURITY DEVICE



(57) Abstract

An attachment mechanism for inhibiting theft of equipment includes a housing for a spindle having a first portion rotatable within the housing (36), a shaft (52) extending outwardly from the housing, and a crossmember (54) at the end of the shaft having peripheral dimensions closely conforming to the internal dimensions of a specially designed slot in the equipment. An abutment mechanism (60) emanates from the housing, and is located on opposite sides of the shaft intermediate the housing and the crossmember. The combined peripheral cross-sectional dimensions of the abutment mechanism and the shaft closely conform to those of the slot. The crossmember (54) is aligned with the abutment mechanism (60) so that the crossmember can be inserted through the slot with the shaft and the abutment mechanism (60) occupying the slot (72). The spindle is rotated 90° to misalign the crossmember with the slot (72), thereby attaching the attachment mechanism (12) rigidly to the external wall. A cable (18) is secured to the housing and to an immovable object to prevent theft of equipment.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	FR	France	MR	Mauritania
AU	Australia	GA	Gabon	MW	Malawi
BB	Barbados	GB	United Kingdom	NL	Netherlands
BE	Belgium	GN	Guinea	NO	Norway
BF	Burkina Faso	GR	Greece	NZ	New Zealand
BG	Bulgaria	HU	Hungary	PL	Poland
BJ	Benin	IE	Ireland	PT	Portugal
BR	Brazil	IT	Italy	RO	Romania
CA	Canada	JP	Japan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo			SE	Sweden
CH	Switzerland	KR	Republic of Korea	SK	Slovak Republic
CI	Côte d'Ivoire	KZ	Kazakhstan	SN	Senegal
CM	Cameroon	LI	Liechtenstein	SU	Soviet Union
CS	Czechoslovakia	LK	Sri Lanka	TD	Chad
CZ	Czech Republic	LU	Luxembourg	TG	Togo
DE	Germany	MC	Monaco	UA	Ukraine
DK	Denmark	MG	Madagascar	US	United States of America
ES	Spain	ML	Mali	VN	Viet Nam
FI	Finland	MN	Mongolia		

COMPUTER PHYSICAL SECURITY DEVICE

BACKGROUND OF THE INVENTION

The present invention relates to devices for inhibiting the theft of relatively small but expensive pieces

Computers have evolved rather rapidly from large, expensive machines usable only by a few, to relatively small, portable machines which are usable by many. In particular, the development of desk top computers with significant processing power has made computers available to the general population. It is now common for college and even high school students to have their own computer, and desk top computers are in wide spread use as word processors and work stations in almost all forms of business. Desk top computers are relatively small and easily transportable, and an undesirable side effect of their proliferation is the fact that the theft of such computers is a significant problem.

A variety of devices have been developed to inhibit the theft of desk top computers and similar equipment. Since desk top computer systems involve several components, typically including the computer itself, a separate monitor, keyboard and often a printer, such security systems often employ a cable which attaches each of the components to each other and to a relatively immovable object such as a desk. The principal difficulty in such systems is providing an effective and convenient method for attaching the cable itself to the equipment.

Kensington Microware Limited, assignee of this application, currently provides a security system which is especially designed for use with particular Apple computers. Certain Apple computer components have slots and internal brackets designed to capture a specially designed tab inserted through the slot so that the tab is not removable. While this system is effective for particular types of Apple computers, it does not work for those Apple computer components and other

computer brands which do not have the special designed slots and brackets.

It is undesirable to require a computer to have specially designed slots and internal capture brackets because the brackets occupy a significant amount of space in an item of equipment which is intended to be as space efficient as possible. Different items of Apple equipment require different sized slots, meaning that the security mechanism must provide a variety of different sized tabs. The tabs, once inserted, cannot be removed without damage to the equipment, meaning that the security system cannot be moved from one computer to the other. Even Apple computers with specially designed slots are typically used with peripheral equipment which does not have them, and, the Kensington system provides screws requiring a special screwdriver which replace the screws used to attach the existing communication cables, securing the peripheral equipment to the base computer by preventing unauthorized removal of the communication cables. This last aspect of the system has the obvious deficiency that the peripheral equipment cannot be removed from the base computer without the special screwdriver, which can be lost or misplaced.

Other vendors provide security systems which are not required to interface directly with special slots and capture mechanisms as provided in certain Apple computers. For example, Secure-It, Inc., under the trademark "KĂBLIT", provides a variety of brackets attached to the computer component using existing mounting screws, i.e., screws which are already used to secure items of equipment within the cabinet. Typically, the bracket is apertured so that passage of the cable through the aperture prevents access to the mounting screw and thus prevents removal of the bracket from the equipment. A deficiency of this type of system is that it requires the removal of the existing mounting screw, which may cause some damage to the internal components of the computer. Suitable existing screws are not always available on certain peripherals for convenient attachment of the fastener. For this latter reason, KĂBLIT also provides glue-on disks which, unfortunately, are permanently secured to the equipment. The

theft of small but expensive equipment such as desk top computers is a growing problem. Existing devices are simply too inefficient or ineffective, or their application is too limited. As a result, the use of such security systems is rare, computer equipment is typically left unprotected, and it is all too often stolen.

SUMMARY OF THE INVENTION

The present invention provides apparatus which inhibits the theft of equipment such as personal computers. The equipment must have an external wall provided with a specially designed, approximately rectangular slot having preselected dimensions. An attachment mechanism includes a housing for a spindle having a first portion rotatable within the housing, a shaft extending outwardly from the housing, and a crossmember at the end of the shaft having peripheral dimensions closely conforming to the internal dimensions of the slot. An abutment mechanism also emanates from the housing, and is located on opposite sides of the shaft intermediate the housing and the crossmember. The peripheral cross-sectional dimensions of the abutment mechanism and the shaft in combination closely conform to the dimensions of the slot. The length of the shaft from the housing to the crossmember is approximately equal to the thickness of the external wall of equipment. The crossmember is aligned with the abutment mechanism so that the crossmember can be inserted through the slot with the shaft and the abutment mechanism occupying the slot. The spindle is then rotated 90° to misalign the crossmember with the slot, thereby attaching the attachment mechanism rigidly to the external wall. A cable is secured to the housing and to an immovable object so that the equipment cannot be stolen.

The apparatus of the present invention is far more adaptable and convenient to use than existing systems. The only required modification of the equipment to be protected is

a small (preferably about 3 by 7 millimeter) slot in an external wall. Additional brackets, capture mechanisms or the like are not necessary. This small slot can easily be molded into computer systems at essentially no cost and without degrading the integrity of the equipment. The attachment mechanism can readily be installed on the equipment, and removed when appropriate by an authorized user. In one embodiment, a key-operated attachment attaches a single item of equipment to an immovable object with the cable. In a second embodiment, the cable passes through mating apertures in the spindle and the housing of one or more attachment mechanisms to prevent their removal once they have been attached to the equipment and the cable has been installed.

The attachment mechanism of the present invention is surprisingly difficult to remove from an item of equipment once it has been installed. In the preferred embodiments, the mechanism is quite small, and it is difficult to apply sufficient leverage to break the mechanism away from the equipment to which it is attached. Forcibly removing the mechanism will result in significant, highly visible damage to the exterior wall, identifying the equipment as stolen and making it difficult to resell, greatly reducing its theft potential.

The novel features which are characteristic of the invention, as to organization and method of operation, together with further objects and advantages thereof will be better understood from the following description considered in connection with the accompanying drawings in which a preferred embodiment of the invention is illustrated by way of example. It is to be expressly understood, however,that the drawings are for the purpose of illustration and description only and are not intended as a definition of the limits of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a first embodiment of the present invention attached to a computer monitor;

FIG. 2 is a perspective view of a second embodiment of the present invention attached to a computer keyboard;

FIG. 3 is a perspective view of the attachment mechanism of the first embodiment;

FIG. 4 is an exploded view of the attachment mechanism of Fig. 3;

FIG. 5 is a fragmentary elevation view of a slot in a piece of equipment specially designed to accept the attachment mechanism of either embodiment of the present invention;

FIG. 6 is a section view taken along lines 6-6 of Fig. 3;

FIG. 7 is a section view taken along lines 7-7 of Fig. 3;

FIG. 8 is a fragmentary section view from inside an item of equipment illustrating insertion of a crossmember of the embodiment of Fig. 3 into the slot of Fig. 5;

FIG. 9 is a view similar to that of Fig. 8 with the crossmember misaligned;

FIGS. 10A and B are elevation views illustrating the installation of the attachment mechanism of Fig. 3 on an item of equipment;

FIG. 11 is a perspective view of the attachment mechanism of the second embodiment of the present invention;

FIG. 12 is an exploded view of the attachment mechanism of Fig. 10;

FIGS. 13 A and B are side elevation views illustrating the installation of the attachment mechanism of Fig. 11 on an item of equipment.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

A first preferred embodiment 10 of the security device of the present invention is illustrated generally by way of reference to Fig. 1. Security device 10 includes an attachment mechanism 12 designed to attach to a component of a computer system, such as computer monitor 14. Attachment

mechanism 12 has an aperture 16, and a cable 18 which passes through the aperture when the attachment mechanism 12 is attached to a component such as monitor 14. A lock 20 is fixed to one end of cable 18. The free end of cable 18 may be of the type having a "mushroom" head 22 adapted to penetrate and be secured within lock 20 using key 24. With mushroom head 22 detached from lock 20, cable 18 can be threaded through the apertures 16 of one or more attachment mechanisms 12, and wrapped around a relatively immovable object (not shown) such as the cross bar spanning two legs of a desk. Mushroom head 22 is then inserted into lock 20 and the lock closed using key 24 to secure the computer components to the immovable object.

A second embodiment 26 of the present invention, designed primarily to secure single rather than multiple items of computer equipment, is illustrated generally by way of reference to Fig. 2. Embodiment 26 includes an attachment mechanism 28 designed to be secured to a computer component such as keyboard 30. Attachment mechanism 28 is affixed to one end of a cable 32 which has a closed loop 34 at its other end. Cable 32 is first wrapped around a relatively immovable object, such as a cross piece between two legs of a desk or table, and attachment mechanism 28 is passed through loop 34 and attached to the item to be protected such as keyboard 30 to make it difficult to steal the item of equipment.

Attachment mechanism 12 of first embodiment 10 is illustrated in more detail by way of reference to Figs. 3 and 4 in combination. Mechanism 12 includes a housing 36 having a hollow interior cylindrical cavity 38. An annular plate 40 forms one end of housing 36 and has an aperture 41. A pair of apertures such as aperture 16 are located on opposite sides of housing 36. A small raised aperture 42 is also provided in housing 36 to accommodate a pin 44, as explained in more detail hereinafter.

A spindle 46 includes a cylindrical portion 48 adapted to fit within the cylindrical cavity of housing 36. Spindle 48 includes a raised plate 50 at one end which forms the aft end of the mechanism when assembled as illustrated in Fig. 3. Spindle 46 also includes a shaft 52 extending

outwardly through the aperture 41 in housing 36. A crossmember 54 is located on the distal end of shaft 52.

An abutment mechanism 56 includes an abutment plate 58 designed to be received within the cylindrical interior cavity of housing 36, and a pair of pins 60 adapted to extend outwardly through the aperture 41 in housing 36. A spring 62 biases abutment plate 58 and spindle 46 rearwardly when the mechanism is assembled, as illustrated in Fig. 3. A plastic bushing 64 designed to prevent scarring of the equipment to which mechanism 12 is attached is affixed to the plate 40 on housing 36 circumscribing aperture 41.

When mechanism 12 is assembled as illustrated in Fig. 3, crossmember 54 and shaft 52, together with pins 60 on either side of the shaft, extend outwardly beyond housing 46 through aperture 41. Pin 44 engages a groove 66 in spindle 46 so that the mechanism cannot be disassembled without removing the pin. The head of pin 44 is conformed to the shape of a boss 67 on the surface of housing 36 so that the pin cannot be removed without special equipment. Groove 66 has a preselected width allowing limited axial movement of spindle 46 relative to housing 36 with pin 44 engaged so that the axial position of crossmember 54 relative to the housing is somewhat adjustable. Spring 62 biases plate 58 and spindle 46 rearwardly to bias crossmember 54 toward housing 36.

Groove 66 extends around about 25% of the periphery of spindle 46 so that the spindle can be rotated approximately 90° relative to the housing. A transverse aperture 68 through the cylindrical portion 48 of spindle 46 is aligned with aperture 16 in housing 36 when crossmember 54 is misaligned from pin 60 (see Fig. 4). With spindle 46 rotated 90°, as allowed by pin 44 in groove 68, crossmember 54 is aligned with pin 60, and aperture 68 is not aligned with aperture 16. Cable 18 (see Fig. 1) can only be inserted through the aligned apertures 16, 68 when crossmember 54 is misaligned with pins 60, i.e., when attachment mechanism 12 is attached to the piece of equipment, as explained hereinbelow. With cable 18 passing through aligned apertures 16 and 68, rotation of spindle 46 so

as to align crossmember 54 with pins 60 and allow removal of the attachment mechanism is effectively prevented.

The preferred embodiments 10 and 26 of the present invention are designed to operate with items of equipment provided by a special slot, as illustrated in Fig. 5. The exterior wall 70 of the piece of equipment is typically made of sheet metal, or molded plastic, either of which is compatible with the present invention. A relatively small slot 72 is formed in wall 70, by molding or otherwise as appropriate. In the preferred embodiment of slot 72, the slot has a generally rectangular configuration, i.e., the slot is generally rectangular having long parallel sides 74, short parallel sides 75 and rounded corners 76. Slot 72 is relatively small, having a long dimension 78 of seven millimeters, and a short dimension 79 of three millimeters, in the preferred embodiment of the present invention. Corners 76 have a radius of curvature 90 from 0.30 mm. to a maximum of 1.5 millimeters. If the radius of curvature 90 is 1.5 mm., the short sides 75 disappear and the slot has a straight-sided oval configuration.

The peripheral dimensions of crossmember 54 are closely conformed to the interior dimensions of slot 72, as illustrated in Fig. 6. The crossmember 4 of attachment mechanism 12 has a straight-sided oval configuration, i.e., the crossmember is generally rectangular, having straight sides and semi-circular ends. In the preferred embodiment, the long dimension 82 of crossmember 54 is 6.75 millimeters, while the short dimension 83 is 2.75 millimeters, each being slightly less than the corresponding dimension of slot 72. As illustrated in Fig. 7, the peripheral dimensions of the pins 60 and shaft 52 also closely conform to the interior dimensions of slot 72. As with crossmember 54, pins 60 in shaft 52 have a long dimension 84 of 6.75 millimeters, and a short dimension 85 of 2.75 millimeters.

The insertion of crossmember 54 of attachment mechanism 12 into slot 72 of external wall 70 is illustrated by reference to Figs. 8 and 10A. Before insertion, spindle 46 must be rotated so that crossmember 54 is aligned with pins 60, as illustrated in Fig. 3. With the spindle in this position,

the periphery of crossmember 54 and that of pins 60 and shaft 52 are essentially congruent. Since the peripheral dimension of crossmember 54 and pins 60 and shaft 52 in combination are less than the dimensions of slot 72, the crossmember can be inserted through the slot until crossmember 54 is completely inside wall 70 (see Fig. 10A). If necessary, the plate 50 on spindle 46 can be pressed to compress spring 62 so that crossmember 54 is completely inside wall 70.

As illustrated in Fig. 9, upon insertion of crossmember 54 completely through slot 72, the spindle is rotated by manipulating plate 50 so that crossmember 54 is 90° misaligned with respect to pins 60. The aperture 16 in the side wall of housing 36 will be aligned with the aperture 68 in the spindle, providing a passageway completely through the housing. In this configuration, cable 18 can easily be threaded through the aperture, and the presence of the cable prevents the spindle from being rotated back so as to disengage crossmember 54 from slot 72.

The attachment mechanism 28 of the second embodiment 26 of the present invention is illustrated in more detail by way of reference to the perspective view of Fig. 11 and the exploded view of Fig. 12. Attachment mechanism 28 includes a hollow shell 90 and a nose-piece 92 which, in combination, form a housing. Shell 90 has a hollow cylindrical interior cavity 94, and an integral apertured plate 96 at one end. A pin 98 is inserted through an aperture (not shown) in nose-piece 92 to engage a slot 102 in shell 90. Pin 98 is designed to shear when torque is applied to nose-piece 92 so that an unauthorized attempt to remove the attachment mechanism will simply shear the pin and allow the nose-piece to freely rotate without degrading the attachment of the attachment mechanism to the component to be protected. Slot 102 is axially elongate so that limited axial movement is allowed between shell 90 and nose-piece 92. The forward end of nose-piece 92 has a plate 93 having a central aperture 95.

A cylindrical collar 106 circumscribes the outer portion of shell 90 and occupies the slot laterally defined by plate 96 and the aft surface 108 of nose-piece 92. Collar 106

has an integral tab 110 with an aperture 112 adapted to receive one end of cable 32. Cable 32 is dead-ended into tab 110 and attached so that it cannot be removed.

A spindle 114 has a cylindrical portion 116 adapted to be received within a cylindrical lock 118 in shell 90. Cylindrical lock 118 includes a front cylinder 119, and a back cylinder 120. A blunt pin or set screw 121 is inserted through an aperture 125 in shell 90, and through a corresponding aperture 123 in back cylinder 120, to lock the front cylinder rotationally with respect to shell 90. Correspondingly, pin or set screw 127 engages a relatively smaller aperture 129 in front cylinder 119, and a widening 131 in slot 133 in the cylindrical portion 116 of spindle 114. Front cylinder 119 is thus fixed rotationally with respect to spindle 114.

As with conventional cylindrical locks, a plurality of pins normally span the interface between front cylinder 119 and back cylinder 120 so that the cylinders are rotationally locked together, thus preventing relative rotation between locking shell 90 and spindle 114. However, a key 140 (see Fig. 13B) is insertable through the apertured plate 96 of shell 90 to engage front cylinder 119. The correct key will have bosses located to depress the pins passing between cylinders 119 and 120 so that such pins do not span the interface between the cylinders, allowing the cylinders to rotate with respect to one another. In this fashion, spindle 114 can be rotated with respect to shell 90 only upon insertion and rotation of the appropriate key.

Spindle 114 also includes a shaft 122, and a crossmember 124 at the free end of the shaft. An abutment mechanism 126 has an abutment plate 128 adapted to fit within nose-piece 92, and a pair of pins 130 adapted to extend outwardly through aperture 95. A spring 132 is located between abutment plate 128 and nose-piece 92 to bias the cylindrical portion 116 of spindle 114 and the abutment plate rearwardly. Abutment plate 126 has an elongate aperture 134 which allows crossmember 124 to extend through the aperture plate. A plastic bushing 136 is fixed to the surface of plate 93 so that

the mechanism does not scar the equipment to which it is attached.

The insertion of attachment mechanism 28 into the exterior wall 137 of a piece of equipment is illustrated by way of reference to Figs. 13 A and B. Wall 136 has a slot 138, which is identical to the slot 72 illustrated in Fig. 8. The peripheral dimensions of crossmember 124, and also those of pins 130 and shaft 122 in combination, are identical to the corresponding parts in Figs. 6 and 7. Simply put, attachment mechanism 28 is designed to fit into the same slot as attachment mechanism 12.

As illustrated in Fig. 13A, crossmember 124 is aligned with pins 30 so that the crossmember can be inserted into slot 138. When fully inserted, the space in the slot is essentially occupied by pins 130 and shaft 122. If necessary, plate 96 can be depressed to push the cylindrical portion 116 of spindle 114 against spring 132. Once crossmember 124 has been fully inserted through slot 138, a key 140 engaging lock mechanism 118 (see Fig. 12) is used to rotate the spindle 90° and misalign crossmember 124 and slot 138.

In operation, both attachment mechanism 12 and attachment mechanism 28 are attached to an item of computer or other equipment which has a specially designed slot 72, 138. First, the crossmember 54, 124 is aligned with the pins 60, 130, for insertion to the crossmember through the slot. The spindle 46, 114 is then rotated relative to the housing to misalign the crossmember 54, 124 relative to the slot. The spindle is locked in this configuration by passing the cable 18 through the mating slot 16, 48 in the first embodiment, or using the key 140 in the second embodiment. Either way, the attachment mechanism is extremely difficult to disengage by anyone not having the appropriate key 24, 140. Any unauthorized attempt to remove the attachment mechanism from the computer component will most likely result in significant damage to the computer housing, making the computer difficult to resell and greatly reducing its theft potential.

While two embodiments of the present invention have been illustrated by way of example, it is apparent that further

embodiments could be developed within the spirit and scope of the present invention. However, it is to be expressly understood that such modifications and adaptations are within the spirit and scope of the present invention, as set forth in the following claims.

WHAT IS CLAIMED IS:

1. Apparatus for inhibiting the theft of equipment such as a personal computer having an external wall provided with a specially designed generally rectangular slot having preselected dimensions, comprising:

an attachment mechanism including a housing, a spindle including a first portion rotatably mounted within the housing, a shaft fixed to the first portion and extending outwardly from the housing, and a crossmember at the distal end of the shaft, the peripheral dimensions of the crossmember conforming closely to the internal dimensions of the slot and the length of the shaft external to the housing being approximately equal to the thickness of the chassis wall, and abutment means emanating from the housing and located on opposite sides of the shaft intermediate the housing and the crossmember, the cross-sectional dimensions of the abutment means and the shaft in combination closely conforming to the dimensions of the slot so that the crossmember, the shaft and the abutment means are insertable into the slot with the crossmember aligned with the abutment means to a position in which the crossmember is inside the external wall and the abutment means and the shaft occupy the slot, and the spindle is then rotatable 90 degrees to misalign the crossmember with the slot to attach the attachment mechanism rigidly to the external wall; and

a cable connected to an immoveable object and adapted to be secured to the housing to inhibit theft of the equipment.

2. The apparatus of claim 1 and additionally comprising a plurality of said locking mechanisms engageable with specially designed slots in a plurality of items of equipment, the housing of each locking mechanism having an aperture and the cable passing through the respective apertures in the housings to secure the items of equipment to one another.

3. The apparatus of claim 1 in which the housing has a transverse aperture, and the first portion of the spindle

includes an aperture aligned with the aperture in the housing when the crossmember is misaligned 90 degrees from the slot, the cable adapted to extend through both the aperture in the housing and the aperture in the spindle to prevent rotation of the spindle.

4. The apparatus of claim 1 wherein the locking element additionally includes a locking mechanism integral with the first portion of the spindle and engageable with the housing, and a key adapted to selectably actuate the locking mechanism to prevent rotation of the spindle.

5. The apparatus of claim 1 wherein the slot in the external wall has dimensions of approximately 7.0 x 3.0 mm., and the crossmember has peripheral dimensions slightly less than the dimensions of the slot.

6. The apparatus of claim 5 wherein the slot in the external wall has rounded corners each having radii of approximately 1.5 mm.

7. The apparatus of claim 6 wherein the periphery of the crossmember has a straight-sided oval configuration.

8. The apparatus of claim 7 wherein the periphery of the crossmember has a transverse dimension between the straight sides thereof of about 2.75 mm. and a longitudinal dimension of about 6.75 mm.

9. The apparatus of claim 1 wherein the abutment means includes a pin plate circumscribing the shaft and attached to the housing, and pin members integral to and projecting from the pin plate on opposite sides of the shaft.

10. The apparatus of claim 9 wherein the pin members each have a partially circular cross-section.

11. The apparatus of claim 9 wherein the pin plate includes an aperture conforming to the peripheral dimensions of the crossmember.

12. The apparatus of claim 1 wherein the first portion of the spindle has a generally cylindrical configuration, and the housing has a generally cylindrical interior cavity conforming to the cylindrical portion of the spindle so that the spindle is rotatably mounted in the housing.

13. The apparatus of claim 12 wherein the first portion of the spindle has a circumferential slot about approximately 90 degrees of its periphery, and wherein the housing includes a pin engaging the peripheral slot to limit the rotation of the spindle to about 90 degrees.

14. The apparatus of claim 1 wherein the housing includes a pair of mating shells defining an inner cavity containing the first portion of the spindle.

15. The apparatus of claim 14 wherein the housing additionally includes a spring for biasing the mating shells apart to press one of the shells against the external wall upon attachment of the attachment means to the item of equipment.

16. The apparatus of claim 1 wherein the housing includes a shell having an outer cylindrical surface, and a collar member having a cylindrical portion rotatably circumscribing said cylindrical surface and a tab portion, the aperture in the housing being located in said tab portion.

17. The apparatus of claim 16 wherein the cable dead ends into and is permanently fixed to the aperture in the housing.

18. Apparatus for attaching a security cable to an item of equipment such as a personal computer having an

external wall provided with a specially designed generally rectangular slot having preselected dimensions, comprising:

a housing having an aperture through which the security cable is adapted to pass to secure the housing to the cable;

a spindle including a first portion rotatably mounted within the housing, a rotatable shaft fixed to the first portion and extending outwardly from the housing, and a crossmember at the distal end of the shaft, the peripheral dimensions of the crossmember conforming closely to the internal dimensions of the slot and the length of the shaft external to the housing being approximately equal to the thickness of the chassis wall; and

abutment means emanating from the housing and located on opposite sides of the shaft intermediate the housing and the crossmember, the cross-sectional dimensions of the abutment means and the shaft in combination closely conforming to the dimensions of the slot so that the crossmember, the shaft and the abutment means are insertable into the slot with the crossmember aligned with the abutment means to a position in which the crossmember is inside the external wall and the abutment means and the shaft occupy the slot, and the spindle is then rotatable 90 degrees to misalign the crossmember with the slot to attach the locking mechanism rigidly to the external wall.

19. The apparatus of claim 18 in which the aperture in the housing is transverse to the axis of the spindle, and the first portion of the spindle includes an aperture aligned with the aperture in the housing when the crossmember is misaligned 90 degrees from the slot, the cable extending through both the aperture in the housing and the aperture in the spindle to prevent rotation of the spindle.

20. The apparatus of claim 18 and additionally comprising a locking mechanism integral with the spindle and engageable with the housing, and a key adapted to selectably

actuate the locking mechanism to prevent rotation of the spindle.

21. The apparatus of claim 18 wherein the housing includes a shell having an outer cylindrical surface, and a collar member having a cylindrical portion rotatably circumscribing said cylindrical surface and a tab portion, the aperture in the housing being located in said tab portion.

22. The apparatus of claim 21 wherein the cable dead ends into and is permanently fixed to the aperture in the housing.

23. The apparatus of claim 18 wherein the slot in the external wall has dimensions of approximately 7.0 x 3.0 mm., and the crossmember has peripheral dimensions slightly less than the dimensions of the slot.

24. The apparatus of claim 23 wherein the slot in the external wall has rounded corners having radii of approximately 1.5 mm.

25. The apparatus of claim 23 wherein the periphery of the crossmember has a straight-sided oval configuration.

26. The apparatus of claim 25 wherein the periphery of the crossmember has a transverse dimension between the straight sides thereof of about 2.75 mm. and a longitudinal dimension of about 6.75 mm.

27. The apparatus of claim 18 wherein the abutment means includes a pin plate attached to the housing, and pin members projecting from the pin plate on opposite sides of the shaft.

28. The apparatus of claim 27 wherein the pin members each have a partially circular cross-section.

29. The apparatus of claim 27 wherein the pin plate includes an aperture conforming to the peripheral dimensions of the crossmember.

30. The apparatus of claim 18 wherein the first portion of the spindle has a generally cylindrical configuration, and the housing has a generally cylindrical interior cavity conforming to the cylindrical portion of the spindle.

31. The apparatus of claim 30 wherein the first portion of the spindle has a peripheral slot about approximately 90 degrees of its periphery, and wherein the housing includes a pin engaging the peripheral slot to limit the rotation of the spindle to about 90 degrees.

32. The apparatus of claim 18 wherein the housing includes a pair of mating shells defining an inner cavity containing the first portion of the spindle.

33. The apparatus of claim 32 wherein the housing additionally includes a spring for biasing the mating shells apart to press one of the shells against the external wall of the item of equipment.

34. Apparatus for securing a plurality of items of equipment together to inhibit theft, each said item having a specially designed generally rectangular slot formed in the external wall thereof, comprising:

a plurality of attachment mechanisms each including a housing having a generally cylindrical interior chamber and a transverse aperture, a spindle having a first portion with a generally cylindrical periphery rotatable in said chamber, a shaft extending axially outwardly from the housing, and a crossmember at the distal end of the shaft having a periphery generally conformed to the shape of the slot, and abutment means extending from the housing on opposite sides of the shaft so that the shaft and abutment means have a cross-section

generally conformed to the shape of the slot, the first portion of the spindle having a transverse aperture aligned with the aperture in the housing when the crossmember is rotated approximately 90 degrees with respect to the abutment means; and

a cable adapted to be inserted through the aligned apertures of the housings and the spindles of the attachment mechanisms after the crossmembers of said mechanisms have been inserted through the slots of respective items of equipment while aligned with the abutment means and then rotated approximately 90 degrees to align the apertures.

35. The apparatus of claim 34 wherein the housing includes a pair of mating shells defining an inner cavity containing the first portion of the spindle.

36. The apparatus of claim 34 wherein the housing additionally includes a spring for biasing the mating shells apart to press one of the shells against the external wall of the item of equipment.

37. Apparatus for inhibiting the theft of equipment such as a personal computer having an external wall provided with a specially designed generally rectangular slot having preselected dimensions, comprising:

an attachment mechanism including a pair of mating shells forming a housing having a peripheral groove and a spring biasing the shells apart, a collar member having a cylindrical portion rotatably circumscribing the groove and a tab portion including an aperture, a spindle having a first portion rotatable in the housing, a shaft extending outwardly from the housing, and a crossmember at the distal end of the shaft having peripheral dimensions generally conformed to the dimensions of the slot, a locking mechanism intermediate the housing and the spindle and actuatable by a key to prevent relative rotation of the spindle and housing, and abutment means extending outwardly from the housing on opposite sides of the shaft so that the abutment means and shaft in combination

have a cross-section generally conformed to the dimensions of the slot; and

a cable having a loop formed in one end and having the other end dead ended into and permanently fixed to the aperture in the collar member so that the attachment mechanism can be fixed to the external wall by aligning the crossmember with the abutment means and inserting the crossmember through the slot, and the spindle rotated to misalign the crossmember and the slot and the locking mechanism actuated to lock the spindle in position to secure the cable to the item of equipment.

38. The apparatus of claim 37 wherein the mating shells are joined by a pin, said pin having a limited shear strength so that torque applied to one of the shells in an attempt to dislodge it will shear the pin and allow said shell to rotate.

39. A method for inhibiting the theft of equipment such as a personal computer comprising the steps of:

providing a specially designed generally rectangular slot in an external wall of the equipment having preselected peripheral dimensions;

providing an attachment mechanism having a housing, a rotatable shaft extending outwardly from the housing and having a crossmember at its distal end having peripheral dimensions generally conformed to the shape of the slot, and an abutment mechanism circumscribing the shaft;

inserting the crossmember through the slot into the interior of the equipment;

generally filling the slot with the abutment mechanism and the shaft while the crossmember is inserted through the slot to inhibit movement of the attachment mechanism;

rotating the shaft while the crossmember is inserted through the slot to misalign the crossmember and the slot and prevent withdrawal of the crossmember through the slot;

locking the rotary position of the shaft relative to the housing with the crossmember misaligned with the slot; and

securing the locking device to a fixed location to prevent theft of the equipment.

40. The method of claim 34 wherein the attachment mechanism providing step includes providing an attachment mechanism in which the housing and a first portion of the spindle inside the housing rotatable with the shaft have apertures which are aligned when the crossmember is misaligned with the slot, and wherein the locking step comprises passing a cable through aligned apertures in the attachment mechanism.

41. The method of claim 34 wherein the attachment mechanism includes a cable fixed to the housing, wherein the locking step includes locking the position of the shaft relative to the housing with a key-actuated lock fixed to the shaft and engageable with the housing, and wherein the securing step includes securing the cable to the fixed location.

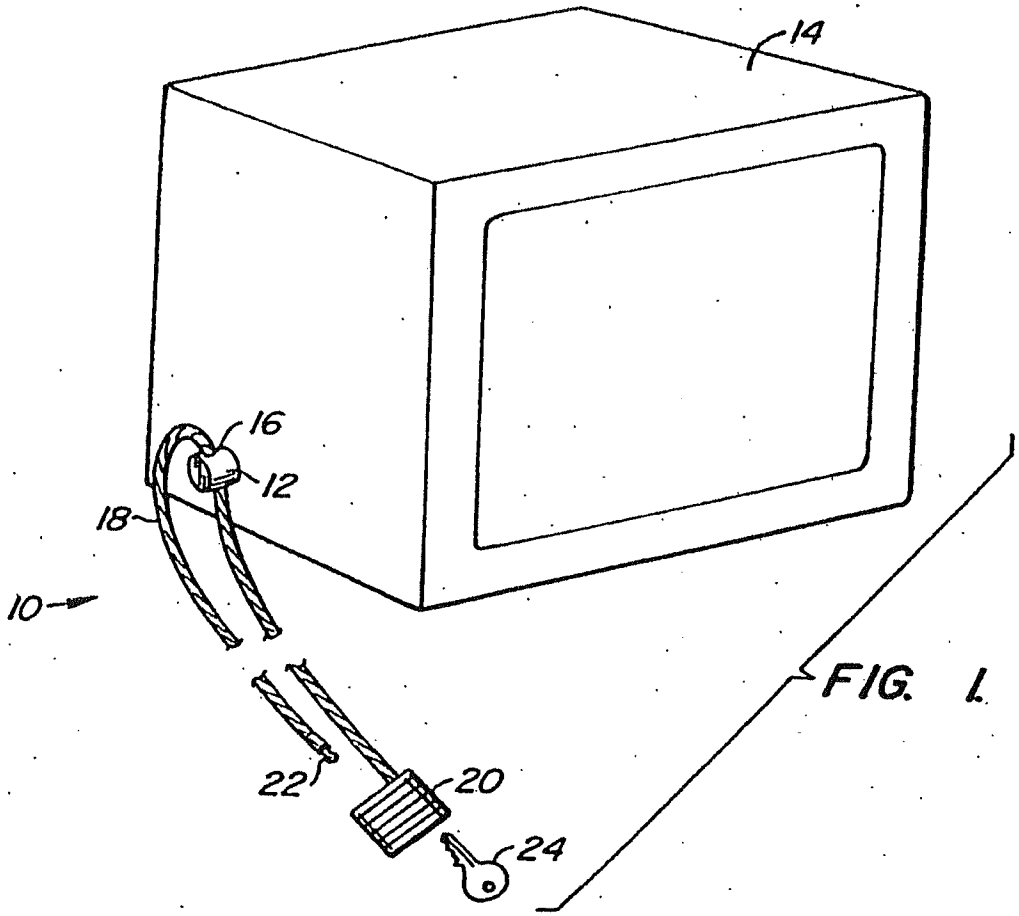


FIG. 1.

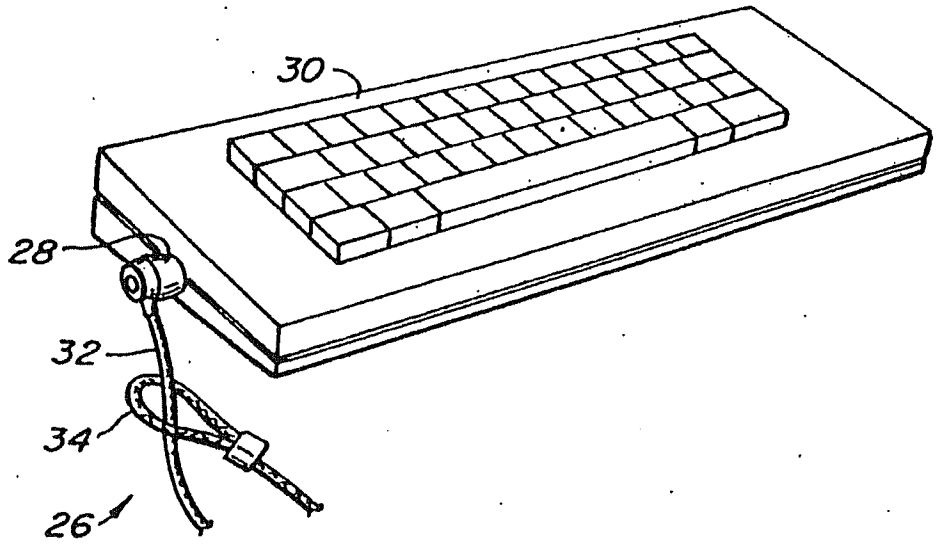


FIG. 2.

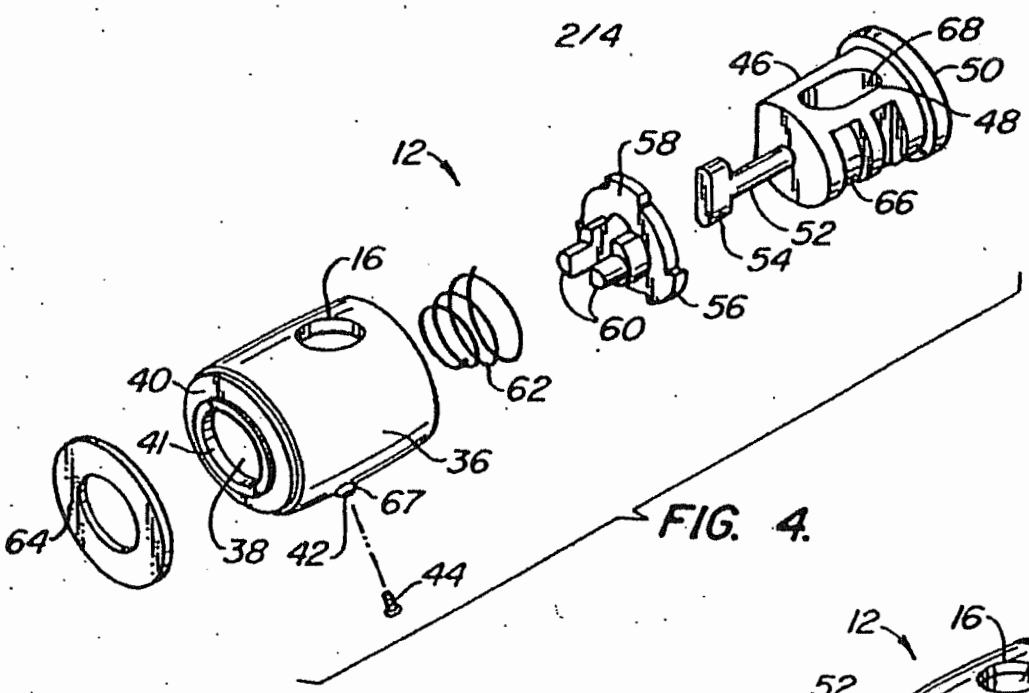


FIG. 4.

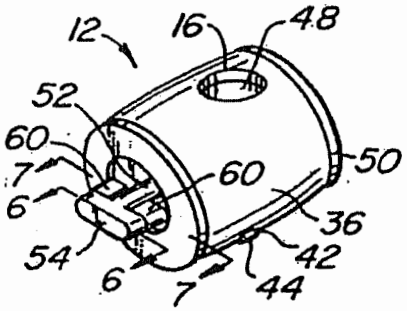


FIG. 3.

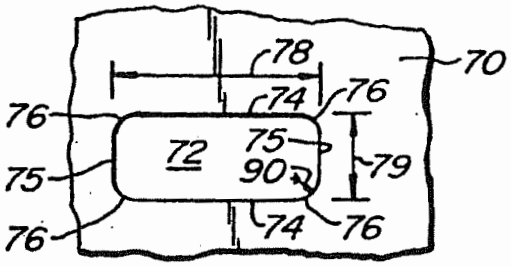


FIG. 5.

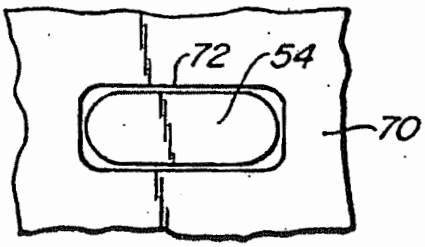


FIG. 8.

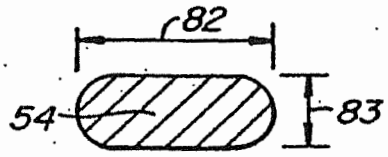


FIG. 6.

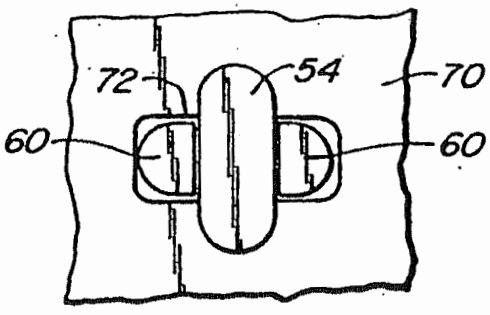


FIG. 9.

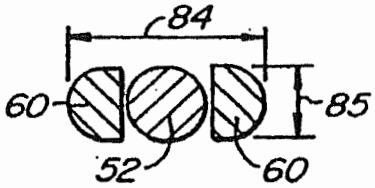


FIG. 7.

SUBSTITUTE SHEET

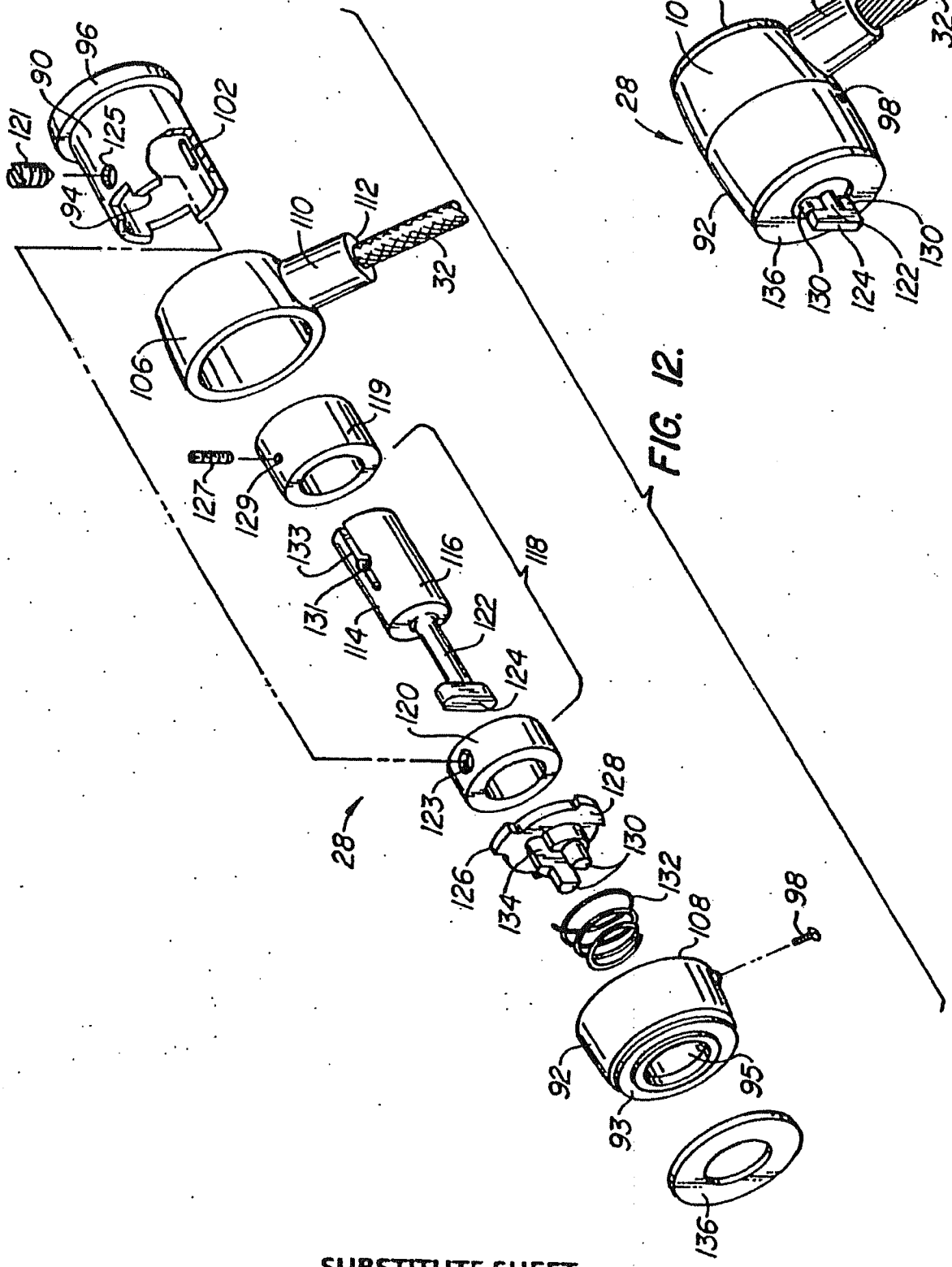

121
90
96
125
94
102
110
112
32
106
119
127
129
133
131
116
114
122
124
118
120
123
28
128
130
126
134
132
108
98
92
95
93
136

FIG. 12.

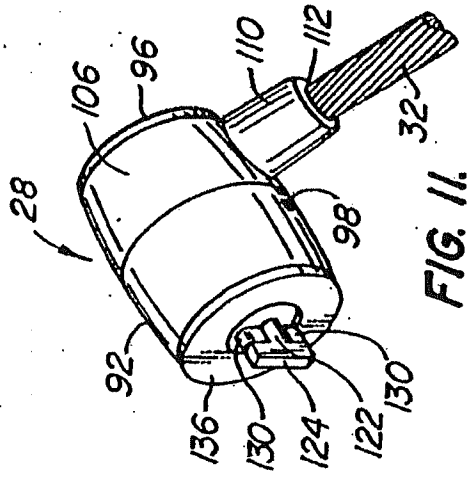

106
96
110
112
32
28
98
92
136
130
124
122
130

FIG. 11.

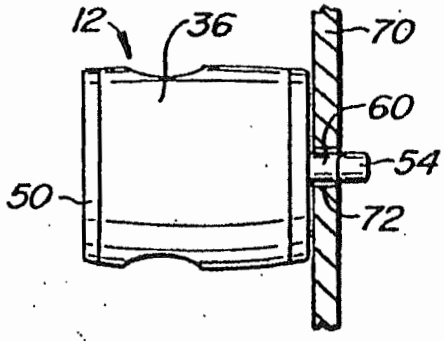


FIG. 10A.

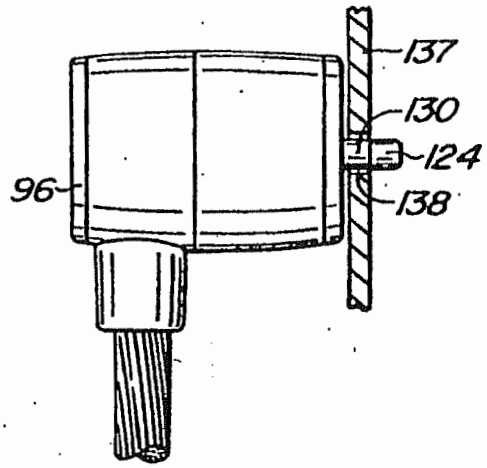


FIG. 13A.

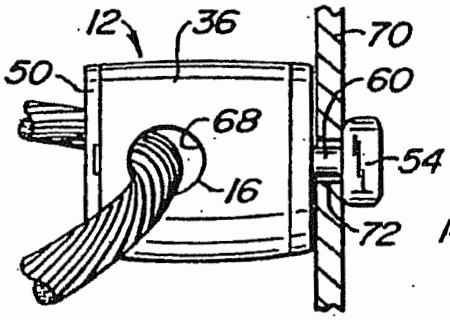


FIG. 10B.

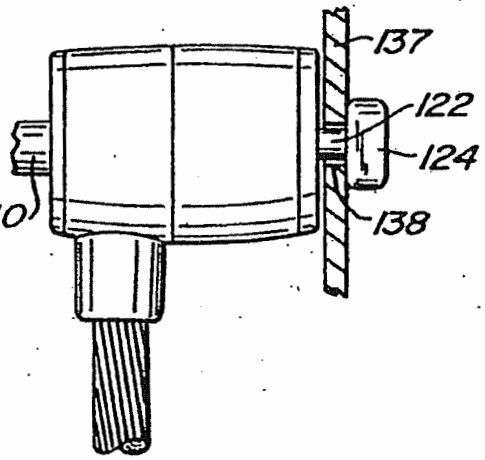


FIG. 13B.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US93/00423

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) :E05B 73/00
US CL :70/58

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 70/57,58,14,18,30,49;232,491; 248/551,553,505

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US, A, 4,057,984 (AVAIUSINI) 15 November 1977. see entire document	39 1-2,4-8,12-18,30-33,37-38
Y	US, A, 3,859,826 (SINGER ET AL.) 14 January 1975. see entire document	1-2,4-8,12-18,30-33,37-38
A	US, A, 4,462,233 (HORETZKE) 31 July 1984.	1-3,12,14,15,34-36
A,P	US, A, 5,119,649 (SPENCE) 09 June 1992.	1-3,12,14,15,34-36

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be part of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)		
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

Date of the actual completion of the international search 23 FEBRUARY 1993	Date of mailing of the international search report 22 APR 1993
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. NOT APPLICABLE	Authorized officer DARNELL M. BOUCHER Telephone No. (703) 308-2168

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, A, 4,907,716 (WANKEL ET AL.) 13 March 1990.	1,4-8,12,14-15,16,39-40
A	US, A, 4,938,040 (HUMPHREYS, JR.) 03 July 1990.	1-3,12,14-15,34-36
A	US, A, 3,785,183 (SANDER) 15 January 1974.	1,4-8,12,14-15

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : E05B 69/00 — A1

(11) International Publication Number: WO 95/10680

(43) International Publication Date: 20 April 1995 (20.04.95)

(21) International Application Number: PCT/US94/11607

(22) International Filing Date: 13 October 1994 (13.10.94)

(30) Priority Data:
08/138,634 15 October 1993 (15.10.93) US

(71) Applicant: KENSINGTON MICROWARE LIMITED [US/US]; 2855 Campus Drive, San Mateo, CA 94403 (US).

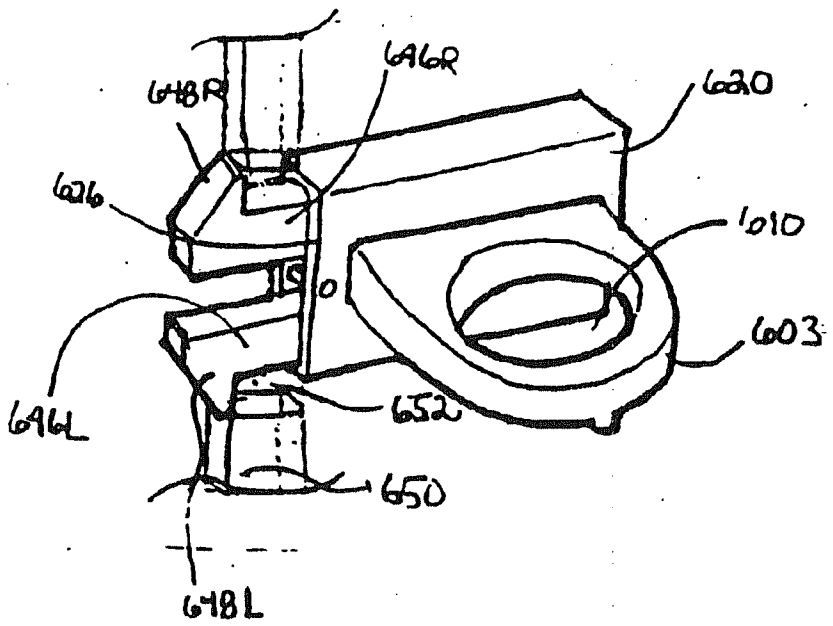
(72) Inventors: MURRAY, William, R., Jr.; 437-D Cork Harbour Circle, Redwood City, CA 94065 (US). CARL, Stewart, R.; 533 Addison, Palo Alto, CA 94306 (US). ZARNOWITZ, Arthur, H.; 1249 Capuchino Avenue #2, Burlingame, CA 94010 (US).

(74) Agents: WOODS, Michael, E. et al.; Townsend and Townsend Khourie and Crew, Steuart Street Tower, 20th floor, One Market Plaza, San Francisco, CA 94105-1492 (US).

(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ).

Published
With international search report.

(54) Title: COMPUTER PHYSICAL SECURITY DEVICE



(57) Abstract

An apparatus which inhibits the theft of equipment such as personal computers having an external wall provided with a specially designed rectangular slot (652). The attachment mechanism includes a housing (622) and a spindle (646R) having a first portion rotatable within the housing, a rotatable shaft extending outwardly from the housing, and a crossmember at the end of the shaft having peripheral dimensions closely conforming to the slot. An abutment mechanism (908) extends from the housing and is accepted by the slot to prevent rotation between the housing and the crossmember which has been rotated to a locked condition. A cable is secured from the housing to immovable object to prevent theft.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgystan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo			SE	Sweden
CH	Switzerland	KR	Republic of Korea	SI	Slovenia
CI	Côte d'Ivoire	KZ	Kazakhstan	SK	Slovakia
CM	Cameroon	LI	Liechtenstein	SN	Senegal
CN	China	LK	Sri Lanka	TD	Chad
CS	Czechoslovakia	LU	Luxembourg	TG	Togo
CZ	Czech Republic	LV	Latvia	TJ	Tajikistan
DE	Germany	MC	Monaco	TT	Trinidad and Tobago
DK	Denmark	MD	Republic of Moldova	UA	Ukraine
ES	Spain	MG	Madagascar	US	United States of America
FI	Finland	ML	Mali	UZ	Uzbekistan
FR	France	MN	Mongolia	VN	Viet Nam
GA	Gabon				

COMPUTER PHYSICAL SECURITY DEVICE

This application is a continuation-in-part of Serial No. 08/042,851, filed April 5, 1993, entitled COMPUTER PHYSICAL SECURITY DEVICE, which is a continuation of Serial No. 07/824,964, filed January 24, 1992 (now abandoned), entitled COMPUTER PHYSICAL SECURITY DEVICE, and a continuation-in-part of Serial No. 08/006,311, filed January 19, 1993, entitled COMPUTER PHYSICAL SECURITY DEVICE, all the above applications are hereby expressly incorporated by reference for all purposes.

BACKGROUND OF THE INVENTION

The present invention relates to devices for inhibiting the theft of relatively small but expensive pieces of equipment.

Computers have evolved rather rapidly from large, expensive machines usable only by a few, to relatively small, portable machines which are usable by many. In particular, the development of desk top computers with significant processing power has made computers available to the general population. It is now common for college and even high school students to have their own computer, and desk top computers are in wide spread use as word processors and work stations in almost all forms of business. Desk top computers are relatively small and easily transportable, and an undesirable side effect of their proliferation is the fact that the theft of such computers is a significant problem.

A variety of devices have been developed to inhibit the theft of desk top computers and similar equipment. Since desk top computer systems involve several components, typically including the computer itself, a separate monitor, keyboard and often a printer, such security systems often employ a cable which attaches each of the components to each other and to a relatively immovable object such as a desk. The principal difficulty in such systems is providing an effective and

convenient method for attaching the cable itself to the equipment.

Kensington Microware Limited, assignee of this application, currently provides a security system which is especially designed for use with particular Apple computers. Certain Apple computer components have slots and internal brackets designed to capture a specially designed tab inserted through the slot so that the tab is not removable. While this system is effective for particular types of Apple computers, it does not work for those Apple computer components and other computer brands which do not have the special designed slots and brackets.

It is undesirable to require a computer to have specially designed slots and internal capture brackets because the brackets occupy a significant amount of space in an item of equipment which is intended to be as space efficient as possible. Different items of Apple equipment require different sized slots, meaning that the security mechanism must provide a variety of different sized tabs. The tabs, once inserted, cannot be removed without damage to the equipment, meaning that the security system cannot be moved from one computer to the other. Even Apple computers with specially designed slots are typically used with peripheral equipment which does not have them, and, the Kensington system provides screws requiring a special screwdriver which replace the screws used to attach the existing communication cables, securing the peripheral equipment to the base computer by preventing unauthorized removal of the communication cables. This last aspect of the system has a drawback in that the peripheral equipment cannot be removed from the base computer without the special screwdriver, which can be lost or misplaced.

Other vendors provide security systems which are not required to interface directly with special slots and capture mechanisms as provided in certain Apple computers. For example, Secure-It, Inc., under the trademark "KĂBLIT", provides a variety of brackets attached to the computer component using existing mounting screws, i.e., screws which are already used to secure items of equipment within the

cabinet. Typically, the bracket is apertured so that passage of the cable through the aperture prevents access to the mounting screw and thus prevents removal of the bracket from the equipment. A deficiency of this type of system is that it requires the removal of the existing mounting screw, which may cause some damage to the internal components of the computer. Suitable existing screws are not always available on certain peripherals for convenient attachment of the fastener. For this latter reason, KABLIT also provides glue-on disks which, unfortunately, are permanently secured to the equipment.

The theft of small but expensive equipment such as desk top computers is a growing problem. Existing devices are simply too inefficient or ineffective, or their application is too limited. As a result, the use of such security systems is rare, computer equipment is typically left unprotected, and it is all too often stolen.

SUMMARY OF THE INVENTION

The present invention provides apparatus which inhibits the theft of equipment such as personal computers. The equipment must have an external wall provided with a specially designed, approximately rectangular slot having preselected dimensions. An attachment mechanism includes a housing for a spindle having a first portion rotatable within the housing, a shaft extending outwardly from the housing, and a crossmember at the end of the shaft having peripheral dimensions closely conforming to the internal dimensions of the slot. An abutment mechanism also emanates from the housing, and is located on opposite sides of the shaft intermediate the housing and the crossmember. The peripheral cross-sectional dimensions of the abutment mechanism and the shaft in combination closely conform to the dimensions of the slot. The length of the shaft from the housing to the crossmember is approximately equal to the thickness of the external wall of equipment. The crossmember is aligned with the abutment mechanism so that the crossmember can be inserted through the slot with the shaft and the abutment mechanism occupying the slot. The spindle is then rotated 90° to misalign the

crossmember with the slot, thereby attaching the attachment mechanism rigidly to the external wall. A cable is secured to the housing and to an immovable object so that the equipment cannot be stolen.

The apparatus of the present invention is far more adaptable and convenient to use than existing systems. The only required modification of the equipment to be protected is a small (preferably about 3 by 7 millimeter) slot in an external wall. Additional brackets, capture mechanisms or the like are not necessary. This small slot can easily be molded into computer systems at essentially no cost and without degrading the integrity of the equipment. The attachment mechanism can readily be installed on the equipment, and removed when appropriate by an authorized user. In one embodiment, a key-operated attachment attaches a single item of equipment to an immovable object with the cable. In a second embodiment, the cable passes through mating apertures in the spindle and the housing of one or more attachment mechanisms to prevent their removal once they have been attached to the equipment and the cable has been installed.

The attachment mechanism of the present invention is surprisingly difficult to remove from an item of equipment once it has been installed. In the preferred embodiments, the mechanism is quite small, and it is difficult to apply sufficient leverage to break the mechanism away from the equipment to which it is attached. Forcibly removing the mechanism will result in significant, highly visible damage to the exterior wall, identifying the equipment as stolen and making it difficult to resell, greatly reducing its theft potential.

Several alternative embodiments of the invention are provided in which there are shown several different combinations of attachment mechanisms which are either integrally connected or separately coupled to engagement mechanisms for securing the attachment mechanism proximate the external wall of the object of equipment. Further embodiments of the invention provide an attachment mechanism that can be directly coupled to the external wall of the object of

equipment without the need to provide a specially designed slot in the wall.

The novel features which are characteristic of the invention, as to organization and method of operation, together with further objects and advantages thereof will be better understood from the following description considered in connection with the accompanying drawings in which a preferred embodiment of the invention is illustrated by way of example. It is to be expressly understood, however,that the drawings are for the purpose of illustration and description only and are not intended as a definition of the limits of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a first embodiment of the present invention attached to a computer monitor;

Fig. 2 is a perspective view of a second embodiment of the present invention attached to a computer keyboard;

Fig. 3 is a perspective view of the attachment mechanism of the first embodiment;

Fig. 4 is an exploded view of the attachment mechanism of Fig. 3;

Fig. 5 is a fragmentary elevation view of a slot in a piece of equipment specially designed to accept the attachment mechanism of either embodiment of the present invention;

Fig. 6 is a section view taken along lines 6-6 of Fig. 3;

Fig. 7 is a section view taken along lines 7-7 of Fig. 3;

Fig. 8 is a fragmentary section view from inside an item of equipment illustrating insertion of a crossmember of the embodiment of Fig. 3 into the slot of Fig. 5;

Fig. 9 is a view similar to that of Fig. 8 with the crossmember misaligned;

Figs. 10A and B are elevation views illustrating the installation of the attachment mechanism of Fig. 3 on an item of equipment;

Fig. 11 is a perspective view of the attachment mechanism of the second embodiment of the present invention;

Fig. 12 is an exploded view of the attachment mechanism of Fig. 10;

Figs. 13A and 13B are side elevation views illustrating the installation of the attachment mechanism of Fig. 11 on an item of equipment;

Figs. 14 and 15 are side elevational views of alternative embodiments of an attachment mechanism and an engagement mechanism;

Figs. 16A and 16B are respective perspective views of another alternative embodiment of an attachment mechanism and an engagement mechanism of the invention;

Fig. 16C is a side elevational view of the attachment mechanism and the engagement mechanism of Figs. 16A and 16B assembled together proximate the external wall of an item of equipment;

Fig. 17A is a side elevational view of another embodiment of the invention;

Fig. 17B is a corresponding perspective view of the embodiment of Fig. 17A;

Fig. 18 is a side elevational view of a slightly modified version of the embodiment of Figs. 17A and 17B showing a threaded engagement between the spindle and the housing;

Fig. 19 is a perspective view of another slightly modified version of the embodiment of Figs. 17A and 17B showing a pin and pin hole engagement between the attachment mechanism and the external wall of an item of equipment;

Figs. 20A, 20B, and 20C are perspective views of component parts of another embodiment of the invention showing a separate attachment mechanism, housing, and engagement mechanism respectively;

Fig. 20D is perspective view of the embodiment of Figs. 20A, 20B, and 20C showing the three component parts in an assembled configuration;

Figs. 21A and 21B are perspective views of component parts of another embodiment of the invention showing an engagement mechanism and a separate attachment mechanism respectively;

Fig. 21C is a side elevational view of the embodiment of Figs. 21A and 21B with the engagement mechanism coupled to the attachment mechanism;

Figs. 22A and 22B are perspective views of slightly modified version of the respective component parts of Figs. 21A and 21B;

Fig. 22C is a side elevational view of the embodiment of Figs. 22A and 22B with the attachment mechanism shown coupled to a slot in the external wall of an item of equipment;

Fig. 23A is a side elevational view of an attachment mechanism coupled to an engagement mechanism according to another embodiment of the invention;

Fig. 23B is a perspective view of the embodiment of Fig. 23A with the attachment mechanism and engagement mechanism shown coupled to a cable and a separate locking device;

Fig. 24A is a perspective view of the attachment mechanism of Figs. 23A and 23B which can be directly coupled to an external wall of an item of equipment;

Fig. 24B is a perspective view of another embodiment of the attachment mechanism of Figs. 23A and 23B which can be directly coupled to an external wall with the use of an adhesive;

Fig. 25 is another embodiment of an attachment mechanism which can be directly coupled to an external wall of an item of equipment;

Fig. 26A is a perspective view of another embodiment of the present invention with a conventional lock assembly and a retractable spindle;

Fig. 26B is a perspective view of the spindle and lock assembly of Fig. 26A showing the spindle in its retracted position; and

Fig. 27 is perspective view of another embodiment of the preferred embodiment including a base unit and an attachment unit.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

A first preferred embodiment 10 of the security device of the present invention is illustrated generally by way

of reference to Fig. 1. Security device 10 includes an attachment mechanism 12 designed to attach to a component of a computer system, such as computer monitor 14. Attachment mechanism 12 has an aperture 16, and a cable 18 which passes through the aperture when the attachment mechanism 12 is attached to a component such as monitor 14. A lock 20 is fixed to one end of cable 18. The free end of cable 18 may be of the type having a "mushroom" head 22 adapted to penetrate and be secured within lock 20 using key 24. With mushroom head 22 detached from lock 20, cable 18 can be threaded through the apertures 16 of one or more attachment mechanisms 12, and wrapped around a relatively immovable object (not shown) such as the cross bar spanning two legs of a desk. Mushroom head 22 is then inserted into lock 20 and the lock closed using key 24 to secure the computer components to the immovable object.

A second embodiment 26 of the present invention, designed primarily to secure single rather than multiple items of computer equipment, is illustrated generally by way of reference to Fig. 2. Embodiment 26 includes an attachment mechanism 28 designed to be secured to a computer component such as keyboard 30. Attachment mechanism 28 is affixed to one end of a cable 32 which has a closed loop 34 at its other end. Cable 32 is first wrapped around a relatively immovable object, such as a cross piece between two legs of a desk or table, and attachment mechanism 28 is passed through loop 34 and attached to the item to be protected such as keyboard 30 to make it difficult to steal the item of equipment.

Attachment mechanism 12 of first embodiment 10 is illustrated in more detail by way of reference to Figs. 3 and 4 in combination. Mechanism 12 includes a housing 36 having a hollow interior cylindrical cavity 38. An annular plate 40 forms one end of housing 36 and has an aperture 41. A pair of apertures such as aperture 16 are located on opposite sides of housing 36. A small raised aperture 42 is also provided in housing 36 to accommodate a pin 44, as explained in more detail hereinafter.

A spindle 46 includes a cylindrical portion 48 adapted to fit within the cylindrical cavity of housing 36.

Spindle 48 includes a raised plate 50 at one end which forms the aft end of the mechanism when assembled as illustrated in Fig. 3. Spindle 46 also includes a shaft 52 extending outwardly through the aperture 41 in housing 36. A crossmember 54 is located on the distal end of shaft 52.

An abutment mechanism 56 includes an abutment plate 58 designed to be received within the cylindrical interior cavity of housing 36, and a pair of pins 60 adapted to extend outwardly through the aperture 41 in housing 36. A spring 62 biases abutment plate 58 and spindle 46 rearwardly when the mechanism is assembled, as illustrated in Fig. 3. A plastic bushing 64 designed to prevent scarring of the equipment to which mechanism 12 is attached is affixed to the plate 40 on housing 36 circumscribing aperture 41.

When mechanism 12 is assembled as illustrated in Fig. 3, crossmember 54 and shaft 52, together with pins 60 on either side of the shaft, extend outwardly beyond housing 46 through aperture 41. Pin 44 engages a groove 66 in spindle 46 so that the mechanism cannot be disassembled without removing the pin. The head of pin 44 is conformed to the shape of a boss 67 on the surface of housing 36 so that the pin cannot be removed without special equipment. Groove 66 has a preselected width allowing limited axial movement of spindle 46 relative to housing 36 with pin 44 engaged so that the axial position of crossmember 54 relative to the housing is somewhat adjustable. Spring 62 biases plate 58 and spindle 46 rearwardly to bias crossmember 54 toward housing 36.

Groove 66 extends around about 25% of the periphery of spindle 46 so that the spindle can be rotated approximately 90° relative to the housing. A transverse aperture 68 through the cylindrical portion 48 of spindle 46 is aligned with aperture 16 in housing 36 when crossmember 54 is misaligned from pin 60 (see Fig. 4). With spindle 46 rotated 90°, as allowed by pin 44 in groove 68, crossmember 54 is aligned with pin 60, and aperture 68 is not aligned with aperture 16. Cable 18 (see Fig. 1) can only be inserted through the aligned apertures 16, 68 when crossmember 54 is misaligned with pins 60, i.e., when attachment mechanism 12 is attached to the piece

of equipment, as explained hereinbelow. With cable 18 passing through aligned apertures 16 and 68, rotation of spindle 46 so as to align crossmember 54 with pins 60 and allow removal of the attachment mechanism is effectively prevented.

The preferred embodiments 10 and 26 of the present invention are designed to operate with items of equipment provided by a special slot, as illustrated in Fig. 5. The exterior wall 70 of the piece of equipment is typically made of sheet metal, or molded plastic, either of which is compatible with the present invention. A relatively small slot 72 is formed in wall 70, by molding or otherwise as appropriate. In the preferred embodiment of slot 72, the slot has a generally rectangular configuration, i.e., the slot is generally rectangular having long parallel sides 74, short parallel sides 75 and rounded corners 76. Slot 72 is relatively small, having a long dimension 78 of seven millimeters, and a short dimension 79 of three millimeters, in the preferred embodiment of the present invention. Corners 76 have a radius of curvature 90 from 0.30 mm. to a maximum of 1.5 millimeters. If the radius of curvature 90 is 1.5 mm., the short sides 75 disappear and the slot has a straight-sided oval configuration.

The peripheral dimensions of crossmember 54 are closely conformed to the interior dimensions of slot 72, as illustrated in Fig. 6. The crossmember 4 of attachment mechanism 12 has a straight-sided oval configuration, i.e., the crossmember is generally rectangular, having straight sides and semi-circular ends. In the preferred embodiment, the long dimension 82 of crossmember 54 is 6.75 millimeters, while the short dimension 83 is 2.75 millimeters, each being slightly less than the corresponding dimension of slot 72. As illustrated in Fig. 7, the peripheral dimensions of the pins 60 and shaft 52 also closely conform to the interior dimensions of slot 72. As with crossmember 54, pins 60 in shaft 52 have a long dimension 84 of 6.75 millimeters, and a short dimension 85 of 2.75 millimeters.

The insertion of crossmember 54 of attachment mechanism 12 into slot 72 of external wall 70 is illustrated by reference to Figs. 8 and 10A. Before insertion, spindle 46

must be rotated so that crossmember 54 is aligned with pins 60, as illustrated in Fig. 3. With the spindle in this position, the periphery of crossmember 54 and that of pins 60 and shaft 52 are essentially congruent. Since the peripheral dimension of crossmember 54 and pins 60 and shaft 52 in combination are less than the dimensions of slot 72, the crossmember can be inserted through the slot until crossmember 54 is completely inside wall 70 (see Fig. 10A). If necessary, the plate 50 on spindle 46 can be pressed to compress spring 62 so that crossmember 54 is completely inside wall 70.

As illustrated in Fig. 9, upon insertion of crossmember 54 completely through slot 72, the spindle is rotated by manipulating plate 50 so that crossmember 54 is 90° misaligned with respect to pins 60. The aperture 16 in the side wall of housing 36 will be aligned with the aperture 68 in the spindle, providing a passageway completely through the housing. In this configuration, cable 18 can easily be threaded through the aperture, and the presence of the cable prevents the spindle from being rotated back so as to disengage crossmember 54 from slot 72.

The attachment mechanism 28 of the second embodiment 26 of the present invention is illustrated in more detail by way of reference to the perspective view of Fig. 11 and the exploded view of Fig. 12. Attachment mechanism 28 includes a hollow shell 90 and a nose-piece 92 which, in combination, form a housing. Shell 90 has a hollow cylindrical interior cavity 94, and an integral apertured plate 96 at one end. A pin 98 is inserted through an aperture (not shown) in nose-piece 92 to engage a slot 102 in shell 90. Pin 98 is designed to shear when torque is applied to nose-piece 92 so that an unauthorized attempt to remove the attachment mechanism will simply shear the pin and allow the nose-piece to freely rotate without degrading the attachment of the attachment mechanism to the component to be protected. Slot 102 is axially elongate so that limited axial movement is allowed between shell 90 and nose-piece 92. The forward end of nose-piece 92 has a plate 93 having a central aperture 95.

A cylindrical collar 106 circumscribes the outer portion of shell 90 and occupies the slot laterally defined by plate 96 and the aft surface 108 of nose-piece 92. Collar 106 has an integral tab 110 with an aperture 112 adapted to receive one end of cable 32. Cable 32 is dead-ended into tab 110 and attached so that it cannot be removed.

A spindle 114 has a cylindrical portion 116 adapted to be received within a cylindrical lock 118 in shell 90. Cylindrical lock 118 includes a front cylinder 119, and a back cylinder 120. A blunt pin or set screw 121 is inserted through an aperture 125 in shell 90, and through a corresponding aperture 123 in back cylinder 120, to lock the front cylinder rotationally with respect to shell 90. Correspondingly, pin or set screw 127 engages a relatively smaller aperture 129 in front cylinder 119, and a widening 131 in slot 133 in the cylindrical portion 116 of spindle 114. Front cylinder 119 is thus fixed rotationally with respect to spindle 114.

As with conventional cylindrical locks, a plurality of pins normally span the interface between front cylinder 119 and back cylinder 120 so that the cylinders are rotationally locked together, thus preventing relative rotation between locking shell 90 and spindle 114. However, a key 140 (see Fig. 13B) is insertable through the apertured plate 96 of shell 90 to engage front cylinder 119. The correct key will have bosses located to depress the pins passing between cylinders 119 and 120 so that such pins do not span the interface between the cylinders, allowing the cylinders to rotate with respect to one another. In this fashion, spindle 114 can be rotated with respect to shell 90 only upon insertion and rotation of the appropriate key.

Spindle 114 also includes a shaft 122, and a crossmember 124 at the free end of the shaft. An abutment mechanism 126 has an abutment plate 128 adapted to fit within nose-piece 92, and a pair of pins 130 adapted to extend outwardly through aperture 95. A spring 132 is located between abutment plate 128 and nose-piece 92 to bias the cylindrical portion 116 of spindle 114 and the abutment plate rearwardly. Abutment plate 126 has an elongate aperture 134 which allows

crossmember 124 to extend through the aperture plate. A plastic bushing 136 is fixed to the surface of plate 93 so that the mechanism does not scar the equipment to which it is attached.

The insertion of attachment mechanism 28 into the exterior wall 137 of a piece of equipment is illustrated by way of reference to Figs. 13 A and B. Wall 136 has a slot 138, which is identical to the slot 72 illustrated in Fig. 8. The peripheral dimensions of crossmember 124, and also those of pins 130 and shaft 122 in combination, are identical to the corresponding parts in Figs. 6 and 7. Simply put, attachment mechanism 28 is designed to fit into the same slot as attachment mechanism 12.

As illustrated in Fig. 13A, crossmember 124 is aligned with pins 30 so that the crossmember can be inserted into slot 138. When fully inserted, the space in the slot is essentially occupied by pins 130 and shaft 122. If necessary, plate 96 can be depressed to push the cylindrical portion 116 of spindle 114 against spring 132. Once crossmember 124 has been fully inserted through slot 138, a key 140 engaging lock mechanism 118 (see Fig. 12) is used to rotate the spindle 90° and misalign crossmember 124 and slot 138.

In operation, both attachment mechanism 12 and attachment mechanism 28 are attached to an item of computer or other equipment which has a specially designed slot 72, 138. First, the crossmember 54, 124 is aligned with the pins 60, 130, for insertion to the crossmember through the slot. The spindle 46, 114 is then rotated relative to the housing to misalign the crossmember 54, 124 relative to the slot. The spindle is locked in this configuration by passing the cable 18 through the mating slot 16, 48 in the first embodiment, or using the key 140 in the second embodiment. Either way, the attachment mechanism is extremely difficult to disengage by anyone not having the appropriate key 24, 140. Any unauthorized attempt to remove the attachment mechanism from the computer component will most likely result in significant damage to the computer housing, making the computer difficult to resell and greatly reducing its theft potential.

Fig. 14 illustrates another embodiment of the invention. Security device 200 includes an attachment mechanism 201 designed to be attached to a portable object of equipment, such as a personal computer (not shown), having an external wall 250. Attachment mechanism 201 comprises a housing 202 which generally includes a top end 204, a bottom end 208, and a generally cylindrical side wall 206, which in combination define internal hollow cavity 210. Side wall 206 has a pair of apertures 212 which are aligned with one another and which are sized to allow a cable 242 to pass through the apertures. Top end 204 is provided with an opening 214 which extends to proximate bottom end 208 to provide access for screw 230 into cavity 210, as will be described in more detail hereinafter. A raised plate 218 having a threaded aperture 216 is provided in bottom end 208 of the housing to accommodate insertion of screw 230.

Integral with bottom end 208 of housing 202 is an engagement mechanism 220 which includes a generally cylindrical shaft 222 and a crossmember 224 attached to the shaft at the distal end of the shaft. As previously described with reference to prior embodiments of the invention, the peripheral dimensions of the crossmember conform closely to the internal dimensions of slot 252. The crossmember 224 is generally rectangular, having straight sides and semi-circular ends, as previously described.

To secure attachment mechanism 201 proximate external wall 250, housing 202 must first be rotated prior to insertion of screw 230 so that crossmember 224 is aligned with slot 252. Since the peripheral dimensions of crossmember 224 and shaft 222 are less than the dimensions of slot 252, crossmember 224 can be inserted through the slot until the crossmember is completely inside external wall 250, with shaft 222 occupying a portion of slot 252. Housing 202 may then be rotated by grasping onto side wall 206 and turning housing 202 until crossmember 224 is 90 degrees misaligned with respect to the slot. In this position of the crossmember, screw 230 can be inserted through opening 214 in the housing and threaded into aperture 216 in raised plate 218 of the housing. With screw

head 232 firmly pressed against the upper surface of plate 218, a length of the screw 234 external the housing will extend beyond the housing for a distance that is slightly greater than the thickness of external wall 250. Further, the peripheral dimension of the screw portion 234 and the shaft 222 in combination is slightly less than the dimensions of the slot. In this way, screw portion 234 and shaft 222 occupy slot 252 when the screw is threadably engaged with aperture 216 in the housing so as to prevent rotation of the housing relative to the external wall and thereby prevent disengagement of crossmember 224 from slot 252. In this configuration, cable 242 can easily be threaded through apertures 212 to secure the housing to an external object (not shown). Once the cable is inserted through apertures 212 in the housing, screw 230 cannot be removed.

Fig. 15 illustrates another embodiment of the invention which has a similar configuration to the embodiment of Fig. 14 except that a spindle 260 is used instead of a screw to prevent rotation of housing 202'. Spindle 260 includes a cylindrical portion 264 adapted to be rotatably mounted within the cylindrical cavity 210' of the housing. An aperture 268 is formed through cylindrical portion 264 and is sized to allow a cable (not shown) to pass through the aperture. Spindle 260 includes a raised plate 266 at a proximal end of the spindle which forms the aft end of the spindle. Spindle 260 also includes a pin member 270 extending outwardly through aperture 216' in housing 202'. The length of the pin member 272 external the housing is slightly greater than the thickness of external wall 250.

In operation, with the crossmember misaligned from the slot as described above with reference to the embodiment of Fig. 14, spindle 260 is positioned in the housing so that base pin 270 is inserted through aperture 216' and into slot 252 proximate shaft 222'. The peripheral dimension of the shaft and the pin in combination is less than the dimension of the slot so that the pin and shaft occupy the slot with the crossmember misaligned 90 degrees. In this position, spindle 260 is rotated by manipulating raised plate 266 so that

apertures 212' in the side wall 206' of housing 202' will be aligned with aperture 268 in cylindrical portion 264 of the spindle, providing a passageway completely through the housing. In this configuration, a cable (not shown) can easily be threaded through the apertures, and the presence of the cable prevents spindle 260 from being separated from the housing.

Figs. 16A, 16B and 16C illustrate another embodiment of the invention in which the attachment mechanism 300 is a separate component from the engagement mechanism 320. Attachment mechanism 300 comprises a housing 302 having a top end 304, a bottom end 308, spaced apart side walls 306, and a peripheral edge wall 309, as seen in an inverted configuration in Fig. 16A. Bottom end 308 includes a generally rectangular opening 310 which extends the length of the housing to closed top end 304. Opening 310 is configured to permit passage of engagement mechanism 320 into housing 302, as will be described in more detail hereinafter. Apertures 312 through side wall 306 are spatially coupled to opening 310 and are sized to allow a cable (not shown) to pass through the apertures. Housing 302 also preferably includes first and second springs 316L and 316R mounted on either side of bottom end 308 of the housing which are used to adjust the relative position of the housing proximate the external wall 350, as best seen in Fig. 16C. Housing 302 further includes first and second, spaced apart abutment plates 314L and 314R located on opposite sides of opening 310.

Engagement mechanism 320, which is configured to fit within housing 302 through opening 310, is shown by way of reference to Fig. 16B and generally includes a spindle 322. Spindle 322 has an upper portion 324 which includes aperture 326 sized to permit passage of a cable (not shown) through aperture 326. Connected to the distal end of upper portion 324 of the spindle is a shaft 328 which has generally rectangular crossmember 330 attached to the shaft at the distal end of the shaft. The dimensions of the crossmember conform closely to the dimensions of the slot 352, as previously described. Engagement mechanism also preferably includes a spring 332 located around the periphery of shaft 328.

In operation, crossmember 330 is aligned with slot 352 and is inserted therein until crossmember 330 is completely inside external wall 350, as seen in Fig. 16C. If necessary, the upper portion 324 of spindle 322 can be firmly pressed to compress spring 332 so that crossmember 330 is completely inside wall 350.

Upon insertion of crossmember 330 completely through slot 352, spindle 322 is rotated so that crossmember 330 is 90 degrees misaligned with slot 352. In this configuration, housing 302 is placed over the spindle 322, so that the spindle is received within opening 310 in the housing. Abutment plates 314L and 314R are inserted into the slot on both sides of shaft 328 extending from spindle 322. With the upper portion 324 of the spindle completely received within the housing, aperture 326 in spindle 322 will be aligned with apertures 312 in housing 302, providing a passageway completely through the housing. In this configuration, a cable (not shown) can be easily threaded through the apertures, and the presence of the cable secures the spindle to the housing. As best seen in Fig. 16C, the peripheral dimension of the abutment plates 314L, 314R and shaft 328 of the spindle in combination closely conform to the dimensions of the slot and thereby occupy the slot. In this way, the housing is fixed relative to the spindle and neither can be rotated back so as to disengage crossmember 330 from slot 352. Springs 316L, 316R are biased against the lower end of the housing to firmly secure housing 302 proximate the external wall 350.

Another embodiment of the invention is shown by way of reference to Figs. 17A and 17B in which a spindle 420, a housing 402, and a spring 440 are assembled to operate as a single unit. Attachment mechanism 400 comprises housing 402 which generally includes top end 404, bottom end 406, and cylindrical side wall 408, which in combination define internal cylindrical cavity 409. A cylindrical opening 412 in the top end 404 of the housing extends to proximate closed bottom end 406 of the housing and is configured to allow engagement mechanism 420 to be rotatably mounted within the housing. Side wall 408 has a pair of apertures 410 which are sized to allow

passage of a cable (not shown) through the apertures. Attached to bottom end 406 of the housing are two abutment plates 414L and 414R which are spaced apart from aperture 416 in bottom end 406 and which are adapted to be inserted into slot 452 in external wall 450 (See Fig. 17B).

Spindle 420 includes a cylindrical portion 424 rotatably mounted within the cylindrical cavity 409 of housing 402. Spindle 420 includes a raised plate 423 at one end which forms the aft end of the spindle. Spindle 420 also includes a shaft 428 extending outwardly through aperture 416 in housing 402. A crossmember 430 is located at the distal end of shaft 428. Aperture 426 through cylindrical portion 424 of the spindle 420 is sized to allow a cable (not shown) to pass through aperture 426. A spring 440 is located at the distal end of cylindrical portion 424 of the spindle and biases the spindle away from the bottom end of housing 402 so that crossmember 430 will firmly engage the inner surface of external wall 450, as will now be described.

When the apparatus is assembled as illustrated in Fig. 17A, crossmember 430 and shaft 428, together with abutment plates 414L and 414R on either side of the shaft, extend outwardly beyond the bottom end 406 of housing 402. Prior to insertion of crossmember 430 into slot 452, spindle 420 must be rotated via raised plate 423 so that crossmember 430 is aligned with slot 452, as seen in Fig. 17B. With the spindle in this position, the crossmember can be inserted through the slot as previously discussed. If necessary, plate 423 can be pressed to compress spring 440 so that crossmember 430 is completely inside wall 450. In this position of the crossmember, shaft 428 and abutment plates 414L, 414R occupy the slot to prevent rotation of the housing relative to external wall 450.

Upon insertion of crossmember 430 completely through slot 452, the spindle is rotated by manipulating plate 423 so that crossmember 430 is 90 degrees misaligned with slot 452. Side wall 408 of housing 402 preferably includes at least one small hole 411 on either side of the housing through which a pin 460 engages a groove (not shown) in the cylindrical portion

424 of the spindle, the groove extending around about 25% of the periphery of cylindrical portion 424 so that the spindle can be rotated substantially only 90 degrees relative to the housing. With the crossmember misaligned from the slot, apertures 410 in the side wall of housing 402 will be aligned with aperture 426 in the spindle providing a passageway completely through the housing. In this configuration, a cable (not shown) can easily be threaded through the aligned apertures, and the presence of the cable prevents the spindle from being rotated back so as to disengage crossmember 430 from slot 452.

The embodiment of Figs. 17A and 17B can be slightly modified to provide a threaded cylindrical portion 424' of the spindle 420', as seen in Fig. 18. In this embodiment, the internal peripheral surface 413 of side wall 408' is also threaded so that the cylindrical portion 424' engages threaded surface 413. This engagement variation between spindle 420' and housing 402' can be used instead of spring 440 in Fig. 17A to adjust the relative lateral displacement between the spindle and the housing.

Fig. 19 illustrates another alternative embodiment of a housing 402" which is used to prevent rotation of the housing relative to the external wall 450 when the crossmember is misaligned with the slot. In this embodiment, pins 472 are mounted to the outer surface of the external wall on either side of slot 452 and engage pin holes 470 located on opposite sides of shaft 428" to prevent rotation of the housing relative to external wall 450 when crossmember 430" is located completely within slot 452 and is misaligned from the slot.

Other embodiments of the invention are described with reference to Figs. 20-23 wherein the engagement mechanism includes at least two engagement portions for engaging with the inner surface of the external wall proximate the slot to prevent removal of the attachment mechanism from proximate the external wall.

Figs. 20A, 20B, 20C and 20D illustrate another embodiment of the invention 600 including three separate components, an attachment mechanism 602 (see Fig. 20A), a

housing 620 (see Fig. 20B), and a separate engagement mechanism 640 (see Fig. 20C). Attachment mechanism 602 includes attachment member 603 shown in an inverted position in Fig. 20A. Attachment member 603 generally includes a top end 604, a bottom end 606, spaced apart side walls 608, and a peripheral edge wall 609. An aperture 610 is provided through side walls 608 and is sized to permit passage of a cable (not shown) through aperture 610. Base portion 612 is integrally connected to attachment member 603 proximate bottom end 606 of the attachment member. A retaining flange 614 is provided proximate top end 604 to retain attachment member 603 within housing 620, as will be described in more detail hereinafter.

Housing 620 is shown by way of reference to Fig. 20B and generally includes a top wall 622, a bottom wall 624, and four separate spaced apart side walls including a front end 626 and a back end 628. A pair of substantially rectangular openings 632 are provided through both top wall 622 and bottom wall 624 of the housing and are configured to allow passage of the attachment member 603 through openings 632. A separate, generally rectangular aperture 630 is provided in front end 626 of housing 620 and extends the length of the housing to the closed back end 628. Aperture 630 is configured to permit passage of engagement mechanism 640 into the aperture, as will be described in more detail hereinafter. Bottom wall 624 is also provided with a pin hole 636 proximate front end 626 which is sized to receive a retaining pin 634 therein. The housing is preferably made from cast metal, but any other suitable material may be used.

Engagement mechanism 640 is shown by way of reference to Fig. 20C and includes an engagement member 642. Engagement member 642 includes first and second, spaced apart engagement arms 646L, 646R which have first and second engagement portions 648L, 648R integrally connected to the arms at the distal end of arms 646L, 646R. A transverse member 644 connects the two engagements arms 646L, 646R together at the proximal end of the arms and defines an abutment surface 645 located towards the distal end of transverse member 644. Engagement arms 646L, 646R and transverse member 644 in combination define clearance

space 649 which is sized to permit passage of attachment member 603 through clearance space 649, as will now be described.

To assemble device 600 prior to securing the device proximate external wall 650, engagement member 642 is initially inserted into rectangular aperture 630 in housing 620 until transverse member 644 abuts against back end 628 of the housing. Retaining pin 634 is subsequently inserted into pin hole 636 in the housing and secured thereto so that engagement member 642 cannot be removed from the housing without removing the pin. Attachment member 603 is then inserted into rectangular openings 632 in the housing and through clearance space 649 of the engagement member so that the attachment member extends outwardly through opening 632 in bottom wall 624 of the housing. Base portion 612 of the attachment member engages the upper surface of top wall 622 of the housing to prevent passage of attachment member 603 completely through housing 620. Retaining flange 614 prevents attachment member 603 from being separated from the housing. Further, abutment surface 645 of transverse member 644 engages with attachment member 603 to secure engagement member 642 to attachment member 603.

When device 600 is assembled as illustrated in Fig. 20D, engagement portions 648L, 648R and a lower portion of engagement arms 646L, 646R extend outwardly beyond front end 626 of housing 620. In this configuration, engagement portions 648L, 648R may be pressed firmly against slot 652 until the engagement portions bend sufficiently inward to fit within slot 652. The inwardly sloped peripheral dimensions of the engagement portions permit easier access into slot 652. Upon insertion of engagement portions 648L, 648R completely within the slot, with a portion of the engagement arms 646L, 646R occupying the slot, the arms will spread back to their natural configuration and thereby engage the internal surface of the external wall 650 proximate slot 652 to secure the device 600 proximate the external wall. A cable (not shown) can then be inserted through aperture 610 in attachment member 603, and the presence of the cable prevents the attachment member 603 from moving relative to housing 620.

Figs. 21A, 21B, and 21C depict another embodiment of the invention, device 700, in which there are two major component parts, attachment mechanism 701 and engagement mechanism 720.

Attachment mechanism 701 of Fig. 21B generally includes an attachment member 702 having a closed top end 704, a bottom end 706, a peripheral edge wall 709, and spaced apart side walls 708. An aperture 710 is provided through side walls 708 and is sized to permit a cable to pass through aperture 710. A generally rectangular opening 712 is further provided in bottom end 706 of attachment member 702 and extends the length of the attachment member to closed top end 704. Opening 712 is configured to accommodate passage of the engagement mechanism 720 into opening 712, as will be described in more detail hereinafter.

Engagement mechanism 720 is shown by way of reference to Fig. 21A and generally includes engagement member 722 having first and second, spaced apart engagement arms 724L and 724R connected at the proximal end of engagement member 702 and defining a clearance space 725 between the arms sized large enough to permit a cable to pass through clearance space 725. Abutment surface 730 is located adjacent the proximal end of the engagement arms. Engagement portions 726L, 726R are integral with engagement arms 724L, 724R at the distal end of the arms. A pair of grooves 728 is provided in engagement portions 726L, 726R, with the length of the groove being substantially equal to the thickness of external wall 750 (See Fig. 21C). Engagement member 722 is preferably injection molded and made from a plastic material to enhance its resiliency. However, it is to be noted that the engagement member may be made from other materials, such as metal, provided that the material is sufficiently resilient to allow engagement arms 724L, 724R to be bent inward sufficiently far enough to allow engagement portions 726L, 726R to be inserted into slot 752.

To utilize device 700, engagement arms 724L, 724R are pressed towards one another so that engagement portions 726L, 726R are positioned sufficiently close to one another to allow

the engagement portions to be inserted into slot 752. As seen in Fig. 21C, grooves 728 engage with external wall 750 when engagement portions 726L, 726R are within slot 752 and have spread back to their natural configuration. In this way, engagement member 722 is firmly secured to external wall 750. Subsequently, attachment member 702 is positioned over engagement member 722 until clearance space 725 is aligned with aperture 710 in the housing. In this configuration, a cable 740 can easily be threaded through aperture 710 in the housing and clearance space 725, and the presence of the cable 740 prevents attachment member 702 from being separated from engagement member 722.

Figs. 22A, 22B, and 22C illustrate a slightly modified version of the embodiment of Figs. 21A, 21B, and 21C. In this embodiment, housing 702' preferably includes a retaining pin hole 714. Engagement mechanism 720' is also slightly modified to include a retaining pin 734 which engages with pin hole 714 proximate bottom end 706' of housing 702' to prevent engagement member 722' from being separated from housing 702' prior to insertion of a cable (not shown). Side walls 732L, 732R forming part of alternative engagement portions 726L', 726R' will spread back to their natural configuration once inserted into slot 752 to thereby engage the inner surface of external wall 750 proximate the slot to affix the engagement member to the external wall. Engagement member 722' of Figs. 22A and 22C is adapted to engage with a slot having substantially smaller peripheral dimensions than the slot necessary to engage with engagement member 722 of Fig. 21A.

Figs. 23A and 23B illustrate another embodiment of the invention 800 in which there are also substantially only two component parts, an attachment mechanism 801 and an engagement mechanism 820. Attachment mechanism 801, shown by way of reference to Fig. 23A, generally includes an attachment member 802 having a top end 804, a bottom end 806, and a cylindrical side wall 808. A pair of apertures 810 are provided through side wall 808 and are sized to permit a cable 840 to pass through apertures 810 (See Fig. 23B). A generally

cylindrical opening 812 is further provided in top end 804 of attachment member 802 and extends the length of the attachment member to a substantially smaller screw opening 814 in bottom end 806 of the attachment member. Opening 812 is configured to accommodate passage of screw 816 through opening 812 to bottom end 806 of the attachment member, as will be described in more detail hereinafter.

Engagement mechanism 820 is used in conjunction with attachment member 802, as is also illustrated in Fig. 23A. Engagement mechanism 820 generally includes engagement member 822 having first and second, spaced apart engagement arms 824L and 824R connected to base portion 830 at the proximal end of engagement member 822 and defining a clearance space 825 between the arms sized large enough to permit screw 816 to pass through clearance space 825. Base portion 830 has a top surface 833 and a bottom surface 831 and is provided with a screw hole 832 through the surfaces. Engagement portions 826L, 826R are integral with engagement arms 824L, 826R at the distal end of the arms. In the preferred embodiment of device 800, engagement portions 826L, 826R have inwardly sloped side walls which facilitate insertion of the engagement portions into slot 852, as previously described.

In operation, engagement portions 826L, 826R are inserted into slot 852 until lower surface 831 of base portion 830 engages the outer surface of external wall 850. In this position of engagement member 822, attachment member 802 is positioned proximate upper surface 833 of base portion 830 until screw hole 832 is aligned with opening 814 in the attachment member. Screw 816 is then inserted through each of opening 812 in the attachment member, opening 814 at the bottom end 806 of the housing, hole 832 in base portion 830, and clearance space 825. The screw will force engagement arms 824L, 824R to spread apart so that engagement portions 826L, 826R will engage the inner surface of external wall 850 proximate slot 852. In this configuration, cable 840 (See Fig. 23B) can be threaded through apertures 810 in the attachment member and attached to an external object, such as lock 860, to

secure the attachment member to the lock. The cable will also prevent removal of screw 816.

It is to be understood that an attachment member 802' can be used independently of engagement mechanism 820 provided that an appropriate screw hole or screw insert is provided in the external wall (not shown) sized to permit screw 816' to engage with the hole (or insert), as is apparent from Fig. 24A. Further, an attachment member 802" may also be secured to an external wall by any other suitable engagement means, as for example providing a double-sided adhesive pad 870 for engaging both the bottom end of the attachment member 802" and the outer surface of the wall (not shown), as seen in Fig. 24B.

In still another embodiment of the same device 800, attachment member 802"' can be hingably connected to a base portion 818 having a screw hole 814"' so that the attachment member 802"' will swing away from the external wall when not in use, as seen in Fig. 25. In this embodiment, base portion 818 may be secured proximate the external wall of an item of equipment via screw 816"' and a threaded insert 819.

The attachment mechanism concept of Figs. 23A and 23B can also be modified to include a conventional lock assembly 910 (as previously described by way of reference to the embodiment of Fig. 2) in combination with a retractable spindle arm 908. As illustrated in Fig. 26A, attachment mechanism 900 is affixed to one end of a cable 920 which has a closed loop 922 at its other end. Cable 920 is first wrapped around a relatively immovable object (not shown) and attachment mechanism 900 is passed through loop 922 and attached to the item to be protected such as external wall 950 to make it difficult to steal.

Attachment mechanism 900 is shown in its retracted position in Fig. 26B and generally includes a housing 902 and first and second, resilient engagement arms 904L and 904R which are mounted to the bottom end of housing 902 and extend outwardly therefrom. Engagement arms 904L, 904R have first and second, inwardly angled engagement portions 906L and 906R at the distal end of each of the arms which are configured so as to be easily received within slot 952 in the retracted position

of spindle arm 908, as will be described in more detail hereinafter. At the other end of housing 902 from the engagement arms is a conventional cylindrical lock assembly 910, an example of which was described in detail by reference to Fig. 13B. A spindle arm 908 is adapted to be mounted to cylindrical lock assembly 910 at one end, with the opposite end of arm 908 extending between engagement arms 904L and 904R external of housing 902. Spindle arm 908 is connected to lock assembly 910 in such a manner that rotation of lock assembly 910 with an appropriate key (not shown) will cause translational movement of spindle arm 908 in the direction of arrow 930 (see Fig. 26B). This movement of arm 908 can be accomplished in any manner as is well known in the art, as for example having spindle arm 908 received within a corkscrew shaped cam attachment mounted to lock assembly 910 so that rotation of the lock will cause corresponding translational movement of spindle arm 908.

In operation, with spindle arm 908 in the retracted position of Fig. 27B, engagement portions 906L and 906R are insertable into slot 952. Once inside of slot 952, a key can be inserted into lock assembly 910 and rotated so that spindle arm 908 will be moved in the direction of arrow 930 to its extracted position. The movement of spindle arm 930 along arrow 930 permits engagement arms 904L and 904R to flex outwards in the direction of arrow 940 so that engagement portions 906L and 906R will move outwards to engage the inner surface of slot 952. In this way, attachment mechanism 900 will be secured proximate external wall 950. To subsequently detach attachment mechanism 900 from proximate external wall 950, the appropriate key is reinserted into lock assembly 910 and rotated to retract spindle arm 908. This will cause engagement arms 904L, 904R to relax back to their natural configuration of Fig. 27B to thereby permit engagement portions 906L, 906R to be separated from slot 952.

Fig. 29 is a perspective view of an alternate preferred embodiment of the present invention. There are occasions that cables and locks are inappropriate or a certain amount of mobility for protected equipment is necessary. In

those instances, using a proximity detecting system 980 can protect portable computer equipment. Proximity detecting system 980 includes a base unit 982 and a remote unit 984 relatively permanently attached to monitor 14 by use of a standardized slot 72 (as shown in Fig. 5 for example). The various embodiments shown in Figs. 1-28 provide examples of different attachment schemes for remote unit 984. Base unit 982 and remote unit 984 operate together to control a separation distance between them. There are many different ways to implement proximity detecting system 980 as well known in the art. One way provides base unit 982 with a transmitter for periodically transmitting a signal to remote unit 984.

In operation, remote unit 984 includes a receiver and a self-powered siren (not shown). Should remote unit 984 fail to receive the periodic transmission, the siren activates to indicate unauthorized removal of the protected equipment. Optionally, remote unit 984 includes a transmitter transmitting a unique ID code allowing base unit 982 to activate a siren and to identify a particular piece of protected equipment.

While several embodiments of the present invention have been illustrated by way of example, it is apparent that further embodiments could be developed within the spirit and scope of the present invention. However, it is to be expressly understood that such modifications and adaptations are within the spirit and scope of the present invention, as set forth in the following claims.

WHAT IS CLAIMED IS:

1. An apparatus for connecting to a portable device having an external wall provided with a specially designed generally rectangular slot having preselected dimensions, comprising:

a housing including a slot engagement member having a slot engaging portion provided with a locking member having a peripheral profile that fits within the preselected dimensions of the slot and thereby permits said locking member to extend into the slot, said slot engagement member being rotatable between an unlocked position wherein said locking member is removable from the slot, and a locked position wherein said locking member is retained within the slot; and

a pin, adapted to interlock said housing and to extend into the security slot proximate said slot engaging portion when said slot engagement member is in said locked position to thereby inhibit rotation of said slot engagement member to said unlocked position.

2. The apparatus of claim 1 wherein a first side of said housing abuts the external wall, said housing includes a cavity and a second side opposite said first side that is open to access said cavity wherein said pin is insertable through said second side and into said cavity to interlock said first side and the security slot.

3. The apparatus of claim 2 wherein said pin includes a threaded portion adapted to thread to a complementary threaded portion in an aperture in said first side of said housing.

4. The apparatus of claim 2 wherein said housing includes opposing sidewalls orthogonal to said first side wherein said opposing sidewalls include apertures to permit an object to extend therethrough after insertion of said pin into the security slot to inhibit removal of said pin from the security slot.

5. The apparatus of claim 2 further comprising a spindle adapted for insertion into said cavity, said spindle incorporating said pin at a first end such that insertion of said spindle into said cavity inserts said pin into the security slot through an aperture in said first side; and wherein said housing includes opposing sidewalls orthogonal to said first side wherein said opposing sidewalls include apertures and a second end of said spindle includes a transverse aperture colinear with said apertures in said opposing sidewalls, said apertures and said transverse apertures permitting an object to extend therethrough after insertion of said pin into the security slot to inhibit removal of said pin from the security slot.

6. An apparatus for connecting to a portable device having an external wall provided with a specially designed generally rectangular slot having preselected dimensions, comprising:

a housing;

a first and a second locking leg generally parallel to each other and adapted for movement between an unlocked position and a locked position, each locking leg secured within said housing and extending from said housing a distance greater than a thickness of the external wall, said first locking leg including a first locking flange at a distal end and said second locking leg including a second locking flange at a distal end wherein said locking flanges oppose each other and are adapted to engage an inner surface of the external wall through the security slot;

a key-actuated lock within said housing, said lock operable from a first postion to a second position; and

a locking member, coupled to said key-actuated lock and responsive to operation of said lock, for moving between a retracted position within said housing when said lock is in said first position to an extended position between said locking legs when said lock is in in said second position, said locking member moving said locking legs from said unlocked

position to said locked position when moving from said retracted position to said extended position.

7. An apparatus for connecting to a portable device having an external wall provided with a specially designed generally rectangular slot having preselected dimensions, comprising:

a housing;

a first and a second locking leg generally parallel to each other and adapted for movement between an unlocked position and a locked position, each locking leg secured within said housing and extending from said housing a distance greater than a thickness of the external wall, said first locking leg including a first locking flange at a distal end and said second locking leg including a second locking flange at a distal end wherein said locking flanges oppose each other and are adapted to engage an inner surface of the external wall through the security slot;

means, coupled to said housing and to said locking legs, for moving said legs from said unlocked position to said locked position while said locking flanges are disposed within the security slot.

8. An apparatus for connecting to a portable device having an external wall provided with a specially designed generally rectangular slot having preselected dimensions, comprising:

a housing;

a first and a second locking leg adapted for movement between an unlocked position and a locked position, each locking leg secured within said housing and extending from said housing a distance greater than a thickness of the external wall, said first locking leg including a first locking flange at a distal end and said second locking leg including a second locking flange at a distal end wherein said locking flanges oppose each other and are adapted to engage an inner surface of the external wall through the security slot; and

a locking member, coupled to a key-actuated lock and responsive to operation of said lock, for moving between a retracted position within said housing when said lock is in said first position to an extended position between said locking legs when said lock is in in said second position, said locking member moving said locking legs from said unlocked position to said locked position when moving from said retracted position to said extended position.

9. An apparatus for connecting to a portable device having an external wall provided with a specially designed generally rectangular slot having preselected dimensions wherein said external wall has an inner surface, comprising:

a slot engagement member having a first end provided with a locking member having a peripheral profile that fits within the preselected dimensions of the slot permitting said locking member to extend into the slot, said slot engagement member having a second end defining a first aperture that extends outside of the portable device when said first end extends within the slot, said engagement member being rotatable between an unlocked position wherein said locking member is removable from the slot, and a locked position wherein said locking member is retained within the slot; and

a housing adapted to be coupled to said slot engagement member when said slot engagement member is in said locked position, said housing including a pin that extends into the slot when said housing is coupled to said slot engagement member in said locked position and said housing further including a wall defining a second aperture, said second aperture coaxial with said first aperture when said pin extends into said slot.

10. The device connecting apparatus of claim 9 further comprising:

a locking object extending through said first and second apertures when they are aligned, said locking object inhibiting decoupling of said housing and said slot engagement member to

thereby inhibit removal of the apparatus from the device as long as said locking object extends through said apertures.

11. An apparatus for connecting to a portable device having an external wall provided with a specifically-designed generally rectangular security slot having preselected dimensions wherein said external wall has an inner surface, comprising:

a slot engagement member having a first portion and a second portion, said first portion including a slot engaging member adapted for insertion within the security slot when in a first position having said slot engaging member aligned with the security slot and adapted to engage an inner surface of the external wall to inhibit removal of the slot engaging member from the security slot when in a second position having said slot engagement member misaligned with the security slot, said second portion defining a first aperture wherein said second portion extends out of the security slot when said slot engagement member is in said second position;

a housing having a second aperture and a receptacle, said receptacle adapted for mating to said second portion of said slot engagement member wherein said first aperture and said second aperture are aligned when said housing is mated to said second portion and slot engagement member is in said second position, said housing including a pin that extends into the slot when said housing is mated to said slot engagement member and said apertures are aligned, wherein said pin inhibits said slot engagement from returning to said first position and thereby inhibits removal of said slot engagement member from the security slot.

12. The apparatus of claim 11 wherein said first portion is "T-shaped" having peripheral dimensions generally conforming to peripheral dimensions of the security slot.

13. The apparatus of claim 11 wherein said apertures of said housing and said slot engagement member are adapted to receive an object passing therethrough to maintain alignment of

said apertures and to thereby maintain said pin within the slot.

14. The apparatus of claim 13 wherein said object is a cable for attaching to a second object other than the portable device.

15. The apparatus of claim 11 wherein said pin extends a distance into the security slot that is greater than a wall thickness of the external wall.

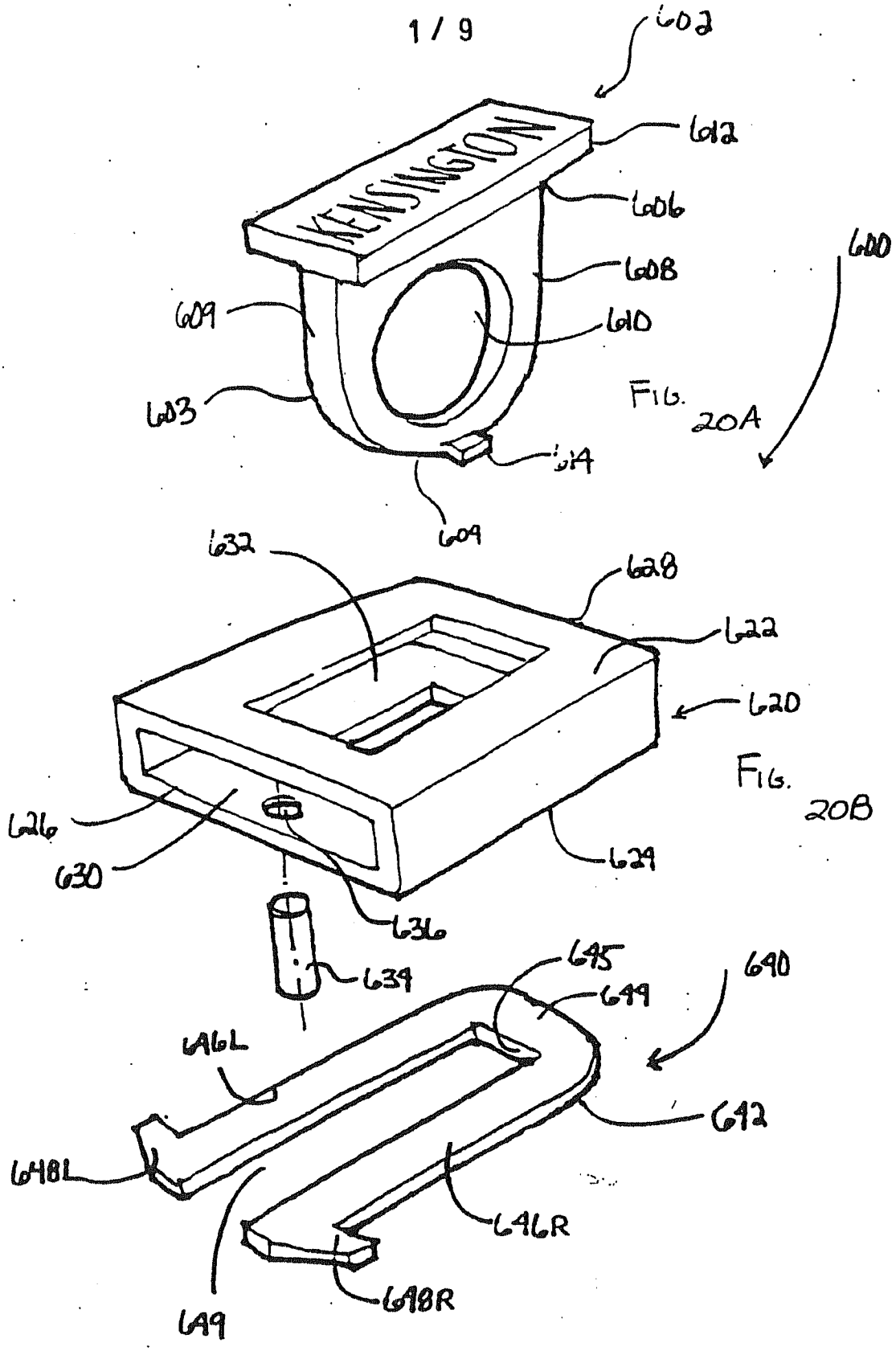


FIG. 20A

FIG. 20B

FIG. 20C

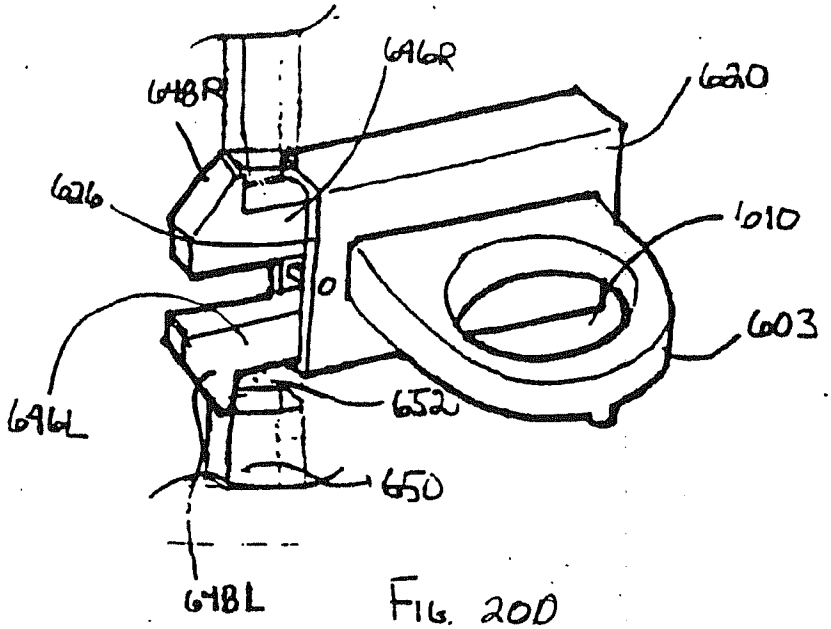


FIG. 20D

Fig. 2C

Fig. 2B

Fig. 2A

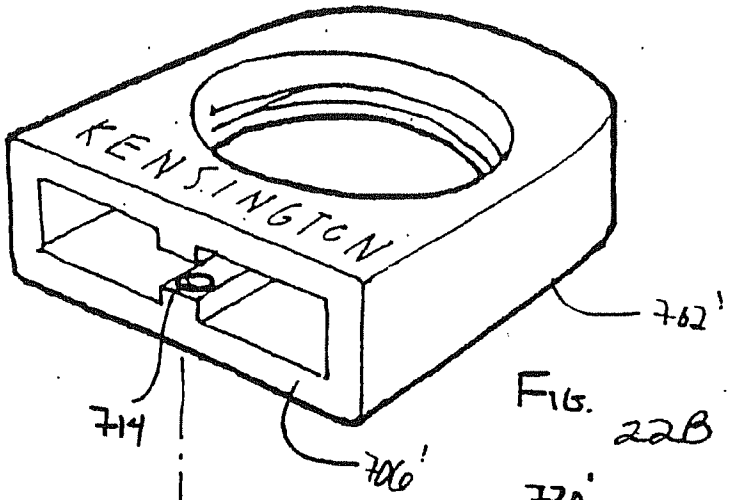


FIG. 22B

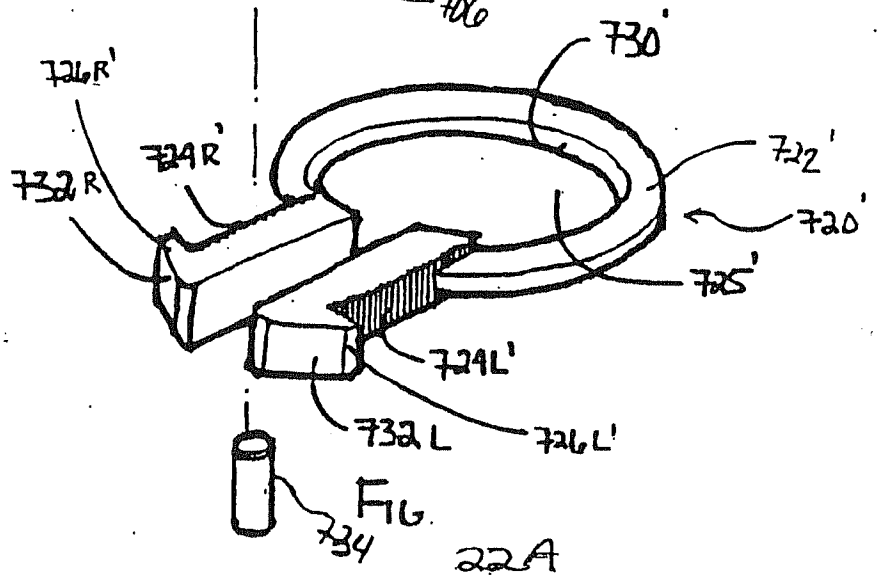


FIG. 22A

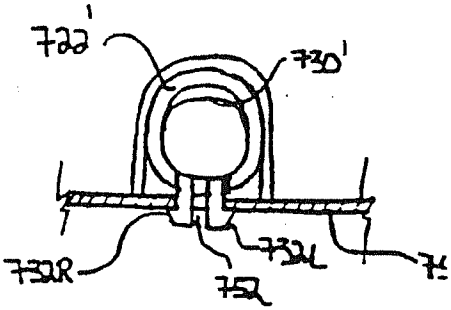


FIG. 22C

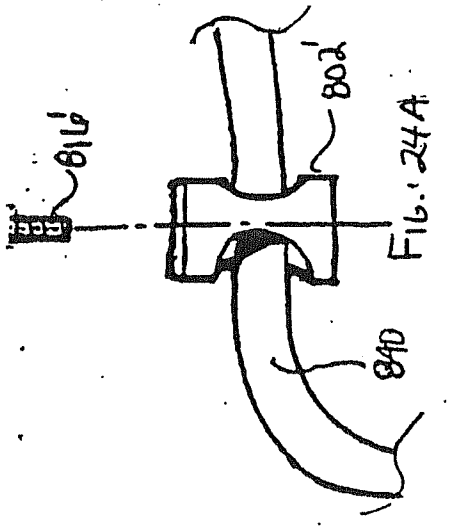


Fig. 24A

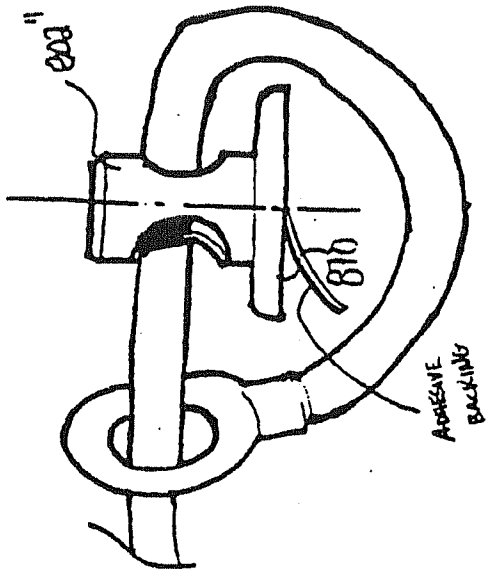


Fig. 24B

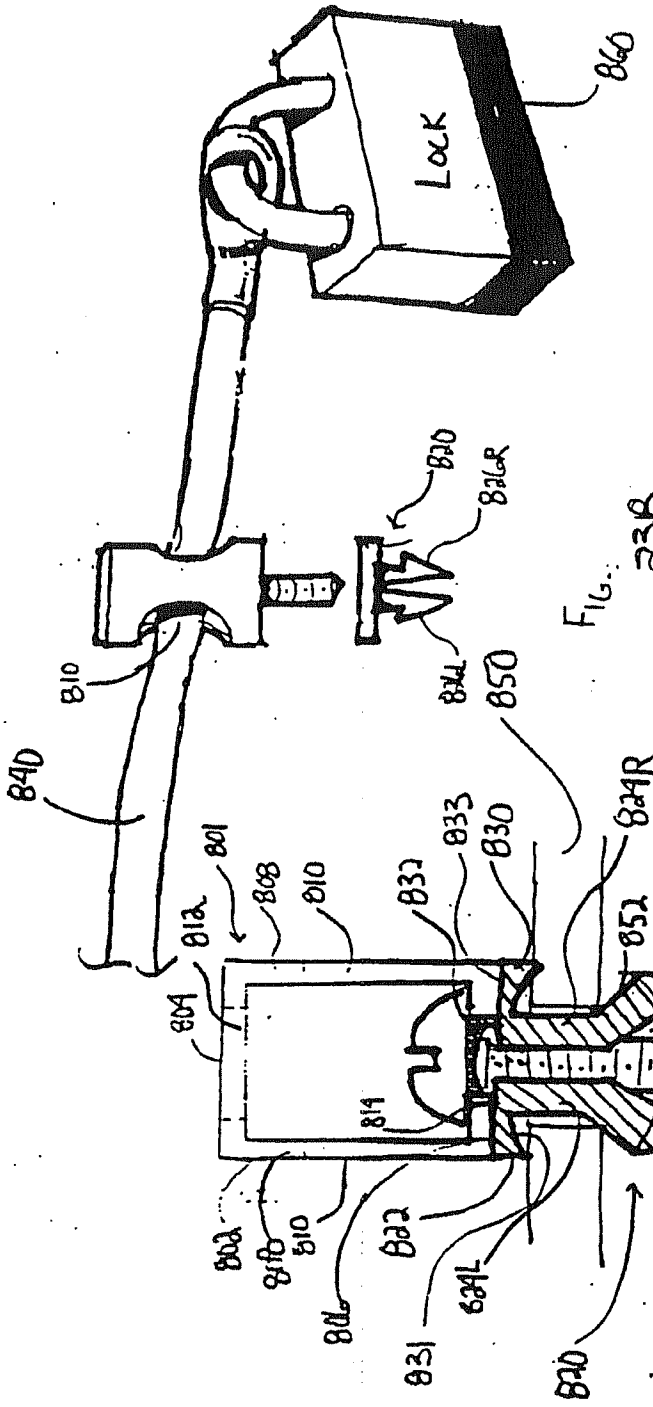


Fig. 23B

Fig. 23A

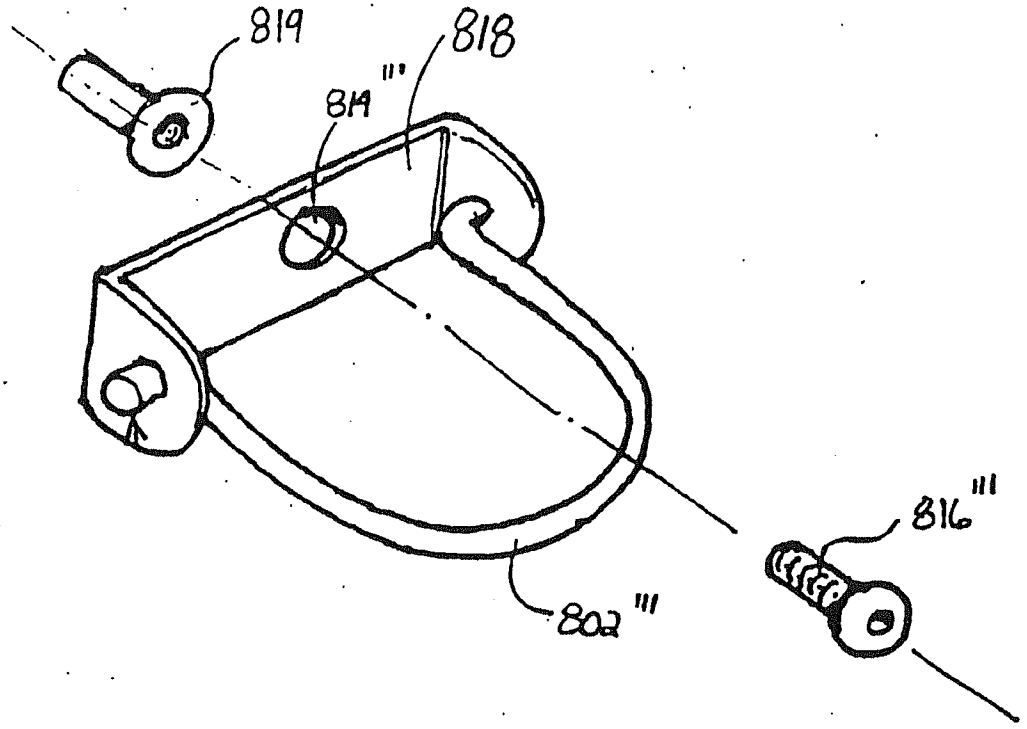


FIG. 25

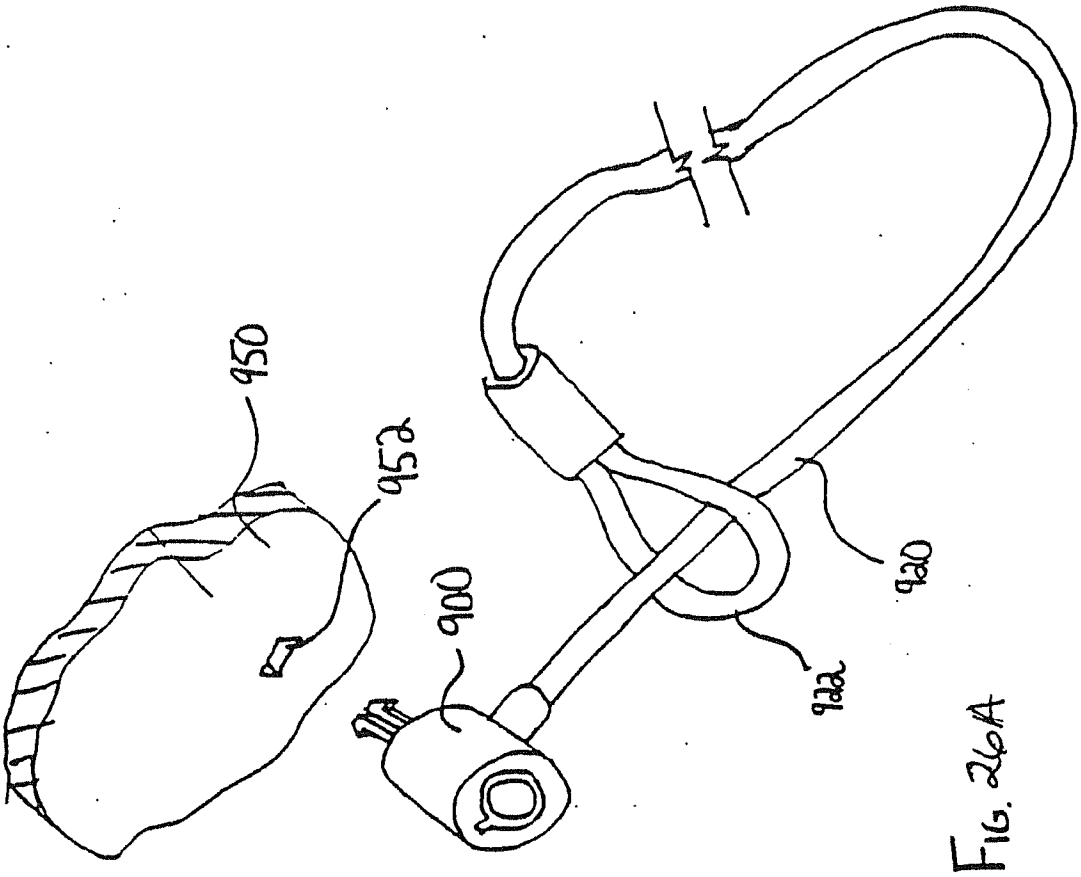


FIG. 26A

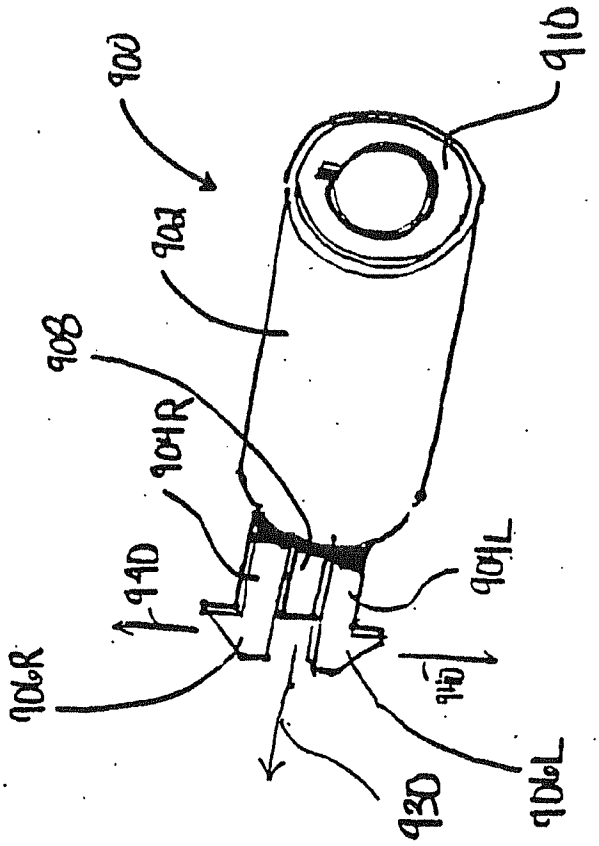


Fig. 26B

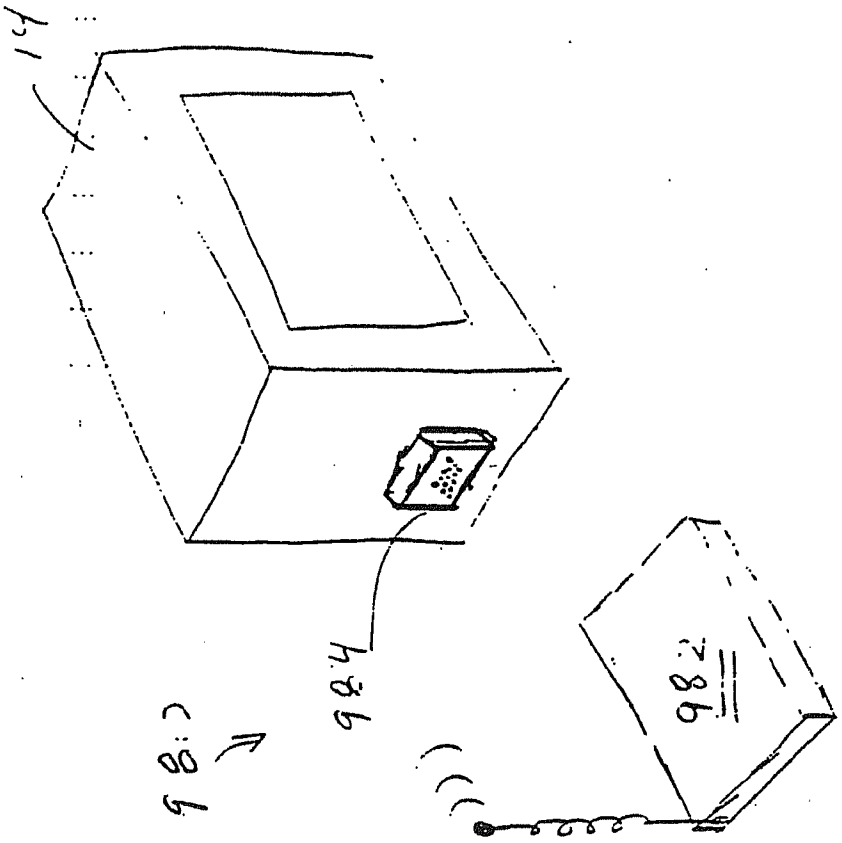


FIG_ 27

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/11607

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :E05B 69/00
US CL :70/58, 14, 57; 248/553
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 70/58, 14, 57, 18, 30, 49, 232; 248/553, 551,505; 411/549,552,555,343,41,55,60

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR, A, 2,308,006 (HARTWELL CORP.) 15 APRIL 1976 (whole document)	6-8
Y	US, A, 5,082,232 (WILSON) 21 JUNE 1992 (whole document)	1-15
Y	US, A, 3,200,694 (RAPATA) 17 AUGUST 1965 (FIGS. 11-12)	1-3, 5
Y	US, A, 3,136,017 (PREZIOSI) 09 JUNE 1964 (whole document)	1-2, 4, 9-15
Y	FR, A, 2,636,686 (LALANNE) 22 SEPTEMBER 1988 (whole document)	9-15
A	US, A, 2,660,084 (NEWMAN) 24 NOVEMBER 1953	6-8

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search	Date of mailing of the international search report
17 NOVEMBER 1994	09 JAN 1995

Name and mailing address of the ISA/US	Authorized officer
Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	DARNELL BOUCHER
Facsimile No. (703) 305-3230	Telephone No. (703) 308-2168

Form PCT/ISA/210 (second sheet)(July 1992)*

PCT WORLD INTELLECTUAL PROPE International Bu

INTERNATIONAL APPLICATION PUBLISHED UNDER

(51) International Patent Classification 6 : E05B 69/00, 73/00 | A1 | (11) Int

WO 9607002A1

(43) International Publication Date: 7 March 1996 (07.03.96)

(21) International Application Number: PCT/US95/10672

(22) International Filing Date: 21 August 1995 (21.08.95)

(30) Priority Data:
08/296,730 26 August 1994 (26.08.94) US

(71) Applicant: KENSINGTON MICROWARE LIMITED [US/US]; 2855 Campus Drive, San Mateo, CA 94403 (US).

(72) Inventor: CARL, Stewart, R.; 533 Addison, Palo Alto, CA 94306 (US).

(74) Agents: WOODS, Michael, E. et al.; Townsend and Townsend and Crew, Steuart Street Tower, 20th floor, One Market Plaza, San Francisco, CA 94105 (US).

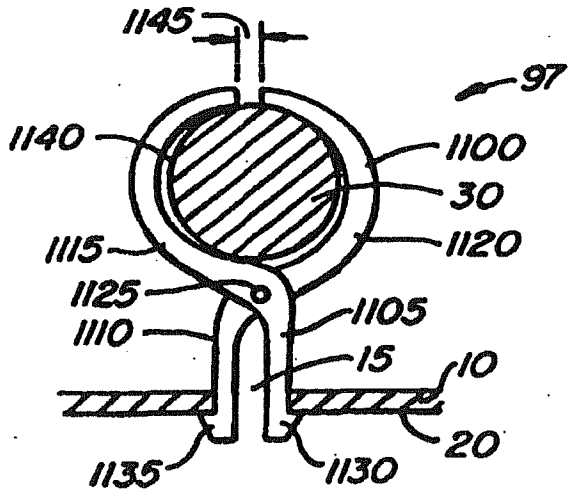
(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ, UG).

Published
With international search report.
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: SECURITY DEVICE FOR A PORTABLE COMPUTER

(57) Abstract

A locking interface for a specially designed slot on a personal computer housing. The interface includes two legs (1105 and 1110) pivotable about an articulation point (1125). The two legs have opposing flanges (1130 and 1135) on one end and handles (1115 and 1120) on an opposite end. The two legs articulate between two positions. In a first position, the legs and flanges may be inserted into the specially designed slot of the personal computer's housing, then articulated into a second position where the flanges of the legs engage an inner surface of the housing to prevent the locking interface's removal. In a preferred embodiment, the handles form an aperture when the device is in the second position. A retaining member (30) such as a cable or shackle of a lock can be inserted through the aperture preventing the locking interface from assuming the first position.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	**GB**	United Kingdom	**MR**	Mauritania
AU	Australia	**GE**	Georgia	**MW**	Malawi
BB	Barbados	**GN**	Guinea	**NE**	Niger
BE	Belgium	**GR**	Greece	**NL**	Netherlands
BF	Burkina Faso	**HU**	Hungary	**NO**	Norway
BG	Bulgaria	**IE**	Ireland	**NZ**	New Zealand
BJ	Benin	**IT**	Italy	**PL**	Poland
BR	Brazil	**JP**	Japan	**PT**	Portugal
BY	Belarus	**KE**	Kenya	**RO**	Romania
CA	Canada	**KG**	Kyrgystan	**RU**	Russian Federation
CF	Central African Republic	**KP**	Democratic People's Republic of Korea	**SD**	Sudan
CG	Congo			**SE**	Sweden
CH	Switzerland	**KR**	Republic of Korea	**SI**	Slovenia
CI	Côte d'Ivoire	**KZ**	Kazakhstan	**SK**	Slovakia
CM	Cameroon	**LI**	Liechtenstein	**SN**	Senegal
CN	China	**LK**	Sri Lanka	**TD**	Chad
CS	Czechoslovakia	**LU**	Luxembourg	**TG**	Togo
CZ	Czech Republic	**LV**	Latvia	**TJ**	Tajikistan
DE	Germany	**MC**	Monaco	**TT**	Trinidad and Tobago
DK	Denmark	**MD**	Republic of Moldova	**UA**	Ukraine
ES	Spain	**MG**	Madagascar	**US**	United States of America
FI	Finland	**ML**	Mali	**UZ**	Uzbekistan
FR	France	**MN**	Mongolia	**VN**	Viet Nam
GA	Gabon				

SECURITY DEVICE FOR A PORTABLE COMPUTER

BACKGROUND OF THE INVENTION

The present invention relates generally to devices for inhibiting the theft of relatively small but expensive pieces of equipment. More specifically, the invention relates to a lock interface for a specially designed slot having predetermined dimensions.

Computers have evolved rather rapidly from large, expensive machines usable only by a few, to relatively small, portable machines which are usable by many. In particular, the development of desktop computers with significant processing power has made computers available to the general population. It is now common for college and even high school students to have their own computer, and desktop computers are in wide spread use as word processors and work stations in almost all forms of business. Desktop computers are relatively small and easily transportable, and an undesirable side effect of their proliferation is the fact that the theft of such computers is a significant problem.

A variety of devices have been developed to inhibit the theft of desktop computers and similar equipment. Since desktop computer systems involve several components, typically including the computer itself, a separate monitor, keyboard and often a printer, such security systems often employ a cable which attaches each of the components to each other and to a relatively immovable object such as a desk. The principal difficulty in such systems is providing an effective and convenient method for attaching the cable itself to the equipment.

Kensington Microware Limited, assignee of this application, currently provides a security system which is especially designed for use with particular Apple computers. Certain Apple computer components have slots and internal brackets designed to capture a specially designed tab inserted through the slot so that the tab is not removable. While this system is effective for particular types of Apple computers,

it does not work for those Apple computer components and other computer brands which do not have the special designed slots and brackets.

It is undesirable to require a computer to have specially designed slots and internal capture brackets because the brackets occupy a significant amount of space in an item of equipment which is intended to be as space efficient as possible. Different items of Apple equipment require different sized slots, meaning that the security mechanism must provide a variety of different sized tabs. The tabs, once inserted, cannot be removed without damage to the equipment, meaning that the security system cannot be moved from one computer to the other. Even Apple computers with specially designed slots are typically used with peripheral equipment which does not have them, and, the Kensington system provides screws requiring a special screwdriver which replace the screws used to attach the existing communication cables, securing the peripheral equipment to the base computer by preventing unauthorized removal of the communication cables. This last aspect of the system has a drawback in that the peripheral equipment cannot be removed from the base computer without the special screwdriver, which can be lost or misplaced.

Other vendors provide security systems which are not required to interface directly with special slots and capture mechanisms as provided in certain Apple computers. For example, Secure-It, Inc., under the trademark "KĂBLIT", provides a variety of brackets attached to the computer component using existing mounting screws, i.e., screws which are already used to secure items of equipment within the cabinet. Typically, the bracket is apertured so that passage of the cable through the aperture prevents access to the mounting screw and thus prevents removal of the bracket from the equipment. A deficiency of this type of system is that it requires the removal of the existing mounting screw, which may cause some damage to the internal components of the computer. Suitable existing screws are not always available on certain peripherals for convenient attachment of the fastener. For

this latter reason, KABLIT also provides glue-on disks which, unfortunately, are permanently secured to the equipment.

The theft of small but expensive equipment such as desktop or laptop computers is a growing problem. Existing devices are simply too inefficient or ineffective, or their application is too limited. As a result, the use of such security systems is rare, computer equipment is typically left unprotected, and it is all too often stolen.

SUMMARY OF THE INVENTION

The present invention provides a simple yet efficient solution to the prior art problem of inhibiting theft of portable equipment. Specifically, the present invention discloses lock interfaces for a specially designed slot having predetermined dimensions and methods of providing a locking interface to a specially designed slot.

In a preferred embodiment, a locking interface for the specially designed slot includes two legs pivotably coupled together about an articulation point. The two legs each have opposing flanges on a first end and handles on a second end. The two legs define a first and a second position, with the flanges and legs adapted for insertion and removal when in the first position. The flanges engage an inner surface of the wall when the legs are in the second position. The preferred embodiment includes a retainer that is coupled to the handles of the first and second legs that retain the legs in the second position when the flanges engage the inner surface.

In the preferred embodiment, the handles define an aperture and an object extends through the aperture to hold the legs in the second position. The object may be any suitable object, including a cable or shackle of a lock.

In operation, a user operates the first and second legs into the first position, inserts the legs into the slot, operates the handles to move the legs to the second position so that the flanges engage the slot. Thereafter, a retainer is coupled to the handles so as to hold the legs in the second position. The retainer may be a cable extending through an

aperture defined by the handles of the legs, though other similar objects may be used.

Further understanding of the nature and advantages of the invention may be realized by reference to the remaining portions of the Specification and Drawings. In the drawings, similarly numbered items represent the same or functionally equivalent structures.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 illustrates a typical use of an embodiment of the present invention;

Fig. 2 illustrates another embodiment of lock interface; and

Fig. 3 is another view of the lock interface in Fig. 2 with the first leg and the second leg in the first position.

DETAILED DESCRIPTION OF SPECIFIC EMBODIMENTS

Fig. 1 illustrates a typical use of an embodiment of the present invention. A portable computer 5 has a wall 10 provided with a slot 15. Wall 10 includes an inner surface 20. A lock interface 25 is engageable with wall 10 through slot 15. A locking mechanism 30, according to the preferred embodiment, includes a cable 35 and a lock 40. In operation, a user inserts lock interface 25 into slot 15 and engages lock interface 25 with inner surface 20. Once engaged, a user can attach lock interface 25 to a stationary object with cable 35 and lock 40.

Fig. 2 is a preferred embodiment of lock interface 97. Lock interface 97 includes an engagement member 1100. Engagement member 1100 includes a first leg 1105, a second leg 1110, a first handle 1115, a second handle 1120, and an articulation point 1125. First leg 1105 includes a flange 1130 at a distal end that is flanged away from second leg 1110, and second leg 1110 includes a flange 1135 at a distal end that is flanged away from first leg 1105. First handle 1115 and second handle 1120 are curved towards each other to define an aperture 1140 and are separated by a space 1145.

First leg 1105 and second leg 1110 are coupled to each other at articulation point 1125. When first leg 1105 and second leg 1110 move towards each other, defining a first position, first handle 1115 and second handle 1120 are moved towards each other by the distance of space 1145, and when first handle 1115 and second handle 1120 are moved away from each other, first leg 1105 and second leg 1110 move away from each other, defining a second position. Fig. 3 is another view of the lock interface in Fig. 2 with first leg 1105 and second leg 1110 in the first position. When first leg 1105 and second leg 1110 are in the first position, flange 1130 and flange 1135 are insertable and removable from slot 15. Fig. 2 illustrates that when first leg 1105 and second leg 1110 are in the second position, flange 1130 and flange 1135 are engageable with inner surface 20.

In operation, a user moves first handle 1115 and second handle 1120 towards each other, causing first leg 1105 and second leg 1110 to move into the first position, and inserts flange 1130 and flange 1135 into slot 15. Moving first handle 1115 and second handle 1120 away from each other causes first leg 1105 and second leg 1110 to move into the second position, allowing engagement of flange 1130 and flange 1135 with inner surface 20. Inserting a locking mechanism 30 through aperture 1140 maintains positioning of first handle 1115 and second handle 1120, maintains positioning of first leg 1105 and second leg 1110 in the second position, and can be used to lock the computer 5 to a stationary object.

In the foregoing specification, the invention has been described with reference to a specific exemplary embodiments thereof. It will, however, be evident that various modifications and changes may be made thereunto without departing from the broader spirit and scope of the invention as set forth in the claims.

Many changes or modifications are readily envisioned, for example, changing the shape of the slot and the shape of the head portion, adding catches to the engagement members, and changing the shape of the flanges among other changes. Additionally, where a cable is shown,

some other type of rigid, non-compressible object can be used to maintain the flange in the locked position. The specification and drawings are, accordingly, to be regarded in an illustrative rather than in a restrictive sense.

WHAT IS CLAIMED IS:

1. A locking interface for a specially designed slot having preselected dimensions in a wall, the wall having an inner surface, the locking interface comprising:

a first leg and a second leg, piviotably coupled about an articulation point, each of said legs having opposing flanges on a first end and opposing handles on a second end, said first leg and said second leg having a second position and a first position, said opposing flanges of said first leg and said second leg adapted for insertion and removal from the slot when in said first position, and said opposing flanges of said first leg and said second leg adapted for engagement with the inner surface when in said second position; and

a retainer, coupled to said opposing handle of said first leg and to said opposing handle of said second leg, adapted for retaining said first leg and said second leg in said second position.

2. The locking interface of claim 1 wherein said opposing handle define an aperture and wherein said retainer is an object passing through said aperture.

3. The locking interface of claim 2 wherein said retainer is a cable passing through said aperture.

4. The locking interface of claim 1, wherein said opposing handles of said first leg and said second leg define a first aperture, and wherein said retainer includes a second aperture, said first aperture and said second aperture co-aligned when said retainer retains said first leg and said second leg in said second position.

5. A locking interface for a specially designed slot having preselected dimensions in a wall, the wall having an inner surface, the locking interface comprising:

a first and a second leg, piviotably coupled about an articulation point, each of said legs having opposing flanges on a first end and opposing handles on a second end,

said first leg and said second leg having a second position and a first position, said opposing flanges of said first leg and said second leg adapted for insertion and removal from the slot when in said first position, and said opposing flanges of said first leg and said second leg adapted for engagement with the inner surface when in said second position; and

means, coupled to said opposing handle of said first leg and to said opposing handle of said second leg, adapted for retaining said first leg and said second leg in said second position.

6. A locking interface for a specially designed slot having preselected dimensions in a wall, the wall having an inner surface, the locking interface comprising:

a first and a second leg, piviotably coupled about an articulation point, each of said legs having opposing flanges on a first end and opposing handles on a second end, said first leg and said second leg having a second position and a first position, said opposing flanges of said first leg and said second leg adapted for insertion and removal from the slot when in said first position, and said opposing flanges of said first leg and said second leg adapted for engagement with the inner surface when in said second position, said opposing handles of said first leg and said second leg defining an aperture, said aperture adapted for inhibiting said first leg and said second leg from moving from said second position to said first position only when an object extends through said aperture.

7. A method of providing a locking interface to a specially designed slot having preselected dimensions in a wall, the wall having an inner surface, the method comprising the steps of:

placing a first and a second leg, piviotably coupled about an articulation point, each of said legs having opposing flanges on a first end and opposing handles on a second end, in a first position, said opposing flanges of said first leg and said second leg adapted for insertion and removal from the

slot when in said first position, said opposing flanges of said first leg and said second leg adapted for engagement with the inner surface in an second position;

inserting said opposing flanges of said first leg and said second leg in the slot when in said first position;

placing said first leg and said second leg in said second position; and

retaining said opposing handles of said first leg and said second leg in said second position with a retainer.

8. The method of claim 7, further comprising the step of:

thereafter aligning a first aperture, formed by said opposing handles of said first leg and said second leg, with a second aperture formed in said retainer;

9. A method of providing a locking interface to a specially designed slot having preselected dimensions in a wall, the wall having an inner surface, the method comprising the steps of:

placing a first and a second leg, piviotably coupled about an articulation point, each of said legs having opposing flanges on a first end and opposing handles on a second end, in a first position, said opposing flanges of said first leg and said second leg adapted for insertion and removal from the slot when in said first position, said opposing flanges of said first leg and said second leg adapted for engagement with the inner surface in a second position;

inserting said opposing flanges of said first leg and said second leg in the slot when in said first position;

placing said first leg and said second leg in said second position; and

retaining said opposing handles of said first leg and said second leg in said second position.

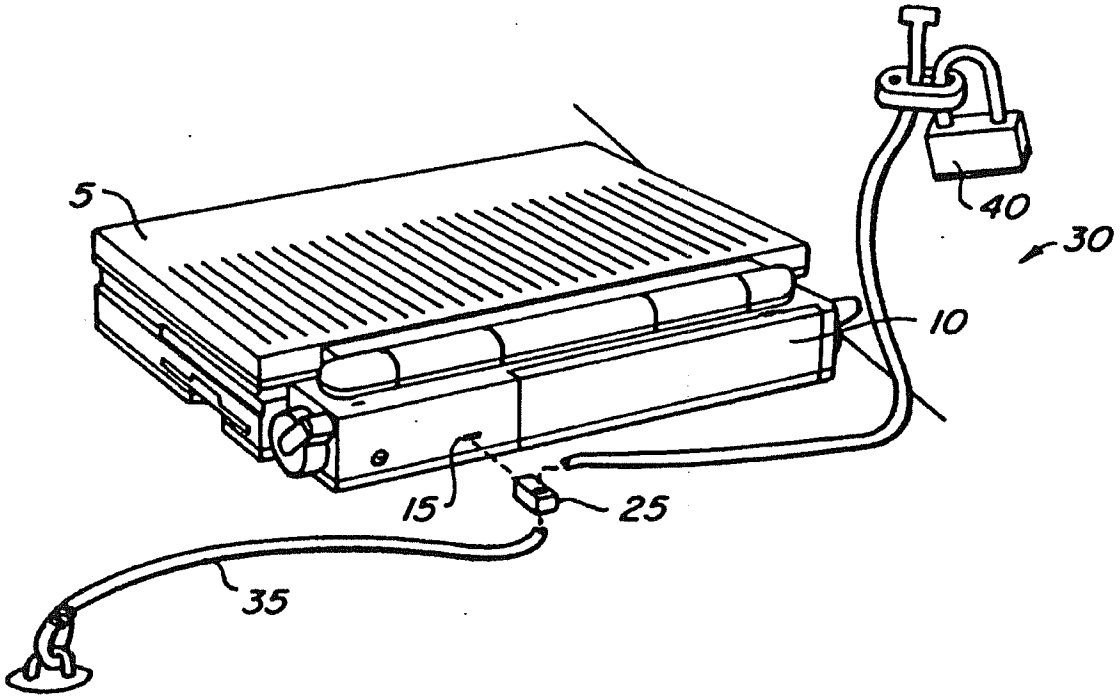


FIG. 1.

Ex. 1002 - Page 599 of 997

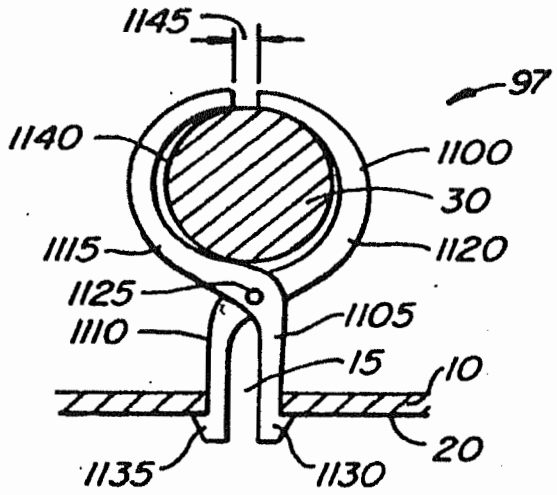

1145
97
1140
1100
30
1115
1120
1125
1105
1110
15
10
20
1135
1130

FIG. 2.

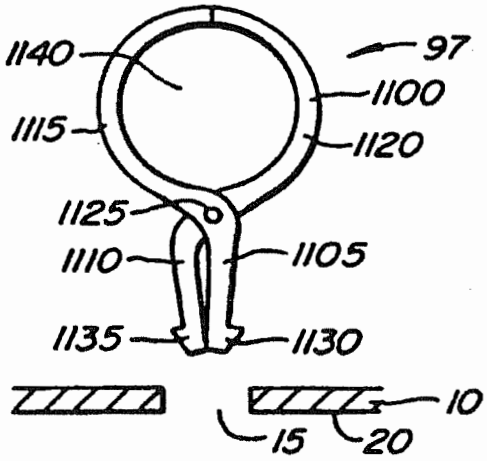

1140
97
1100
1115
1120
1125
1110
1105
1135
1130
10
15
20

FIG. 3.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/10672

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :E05B 69/00, 73/00
US CL : 70/58
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 70/58, 14, 18, 423, 424

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US,A, 505,299 (SCHNEIDER) 19 September 1893	1-9
X --- Y	US, A 934,928 (MICHEL) 21 September 1909, Figures 1 and 2	1, 2, 4-9 --- 3
A	US, A, 942,537 (BATDORF) 07 December 1909	1-9
A	US, A, 4,462,233 (HORETZKE) 31 July 1984	1-9
X --- Y	US, A, 4,738,428 (THEMISTOS) 19 April 1988, col. 1, lines 5-9. Col 2, lines 45-60.	1-9 --- 3
X --- Y	FR,A, 455,740 (DRIESEN) 07 April 1913, Figure 11	1,2, 4-9 --- 3

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search	Date of mailing of the international search report
07 NOVEMBER 1995	22 JAN 1996
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3597	Authorized officer GARY ESTREMSKY Telephone No. (703) 308 - 0494

Form PCT/ISA/210 (second sheet)(July 1992)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US95/10672

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	NO,A 14,095 (NIELSEN) 15 May 1905, Figures 1-3	1, 2, 4-9
Y		3

Form PCT/ISA/210 (continuation of second sheet)(July 1992)*

Electronic Acknowledgement Receipt

EFS ID:	13364516
Application Number:	13526514
International Application Number:	
Confirmation Number:	7327
Title of Invention:	LOCKING ASSEMBLY FOR ELECTRONIC TABLET AND OTHER DEVICES
First Named Inventor/Applicant Name:	Peter Allen
Customer Number:	4988
Filer:	Alfred M. Walker
Filer Authorized By:	
Attorney Docket Number:	120616 Allen TAB Plug CON
Receipt Date:	27-JUL-2012
Filing Date:	18-JUN-2012
Time Stamp:	19:25:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	GB1256295Myatt.pdf	625181 04775432845f665c94b66a236eddbd84fda d2783	no	8

Warnings:	
Information:	

2	Foreign Reference	GB1376011Walters.pdf	789403 2fe906995f4ae1fc1ac0a16898e4d708cc34cb91	no	9
Warnings:					
Information:					
3	Foreign Reference	GB2109109Honda.pdf	1438342 ab77798be8f092976a7f76de068bb6025319359d	no	23
Warnings:					
Information:					
4	Foreign Reference	GB2234856Volumatic.pdf	510212 d7220a6ac21117a15525bd6354218530ba669be2	no	12
Warnings:					
Information:					
5	Foreign Reference	HUP0000398Pataco.pdf	62432 9d9c2fe9ea6b822f6323aebcbaf2baccd28c505e	no	2
Warnings:					
Information:					
6	Foreign Reference	HU224329Safeframe.pdf	144774 38aa0e3a8cd748ad11138a615d36940b4417f1c6	no	2
Warnings:					
Information:					
7	Foreign Reference	IT451949Deitinger.pdf	242891 1160412920631f8d1ebdaaa9f75f29948aa531b4	no	3
Warnings:					
Information:					
8	Foreign Reference	JP49-91096.pdf	314230 74b7f4710d2cadcb3767b5873f227827e4b51672	no	8
Warnings:					
Information:					
9	Foreign Reference	JP37-7592.pdf	94827 84f8de6047878cf84319e88a2ac3f8bdf244ab6f	no	2
Warnings:					
Information:					
10	Foreign Reference	JP52-36813.pdf	487212 e84c6b84e9ce02d5a4dceefe736e1f05c1b6f3cb	no	8
Warnings:					
Information:					

11	Foreign Reference	JP57-25092KoeiMetal.pdf	643355 773a7ec15d7911a35b3ebd45311c2dcb85618e1f	no	16
Warnings:					
Information:					
12	Foreign Reference	JP57-179618.pdf	482913 959182b8725083841c476f741f4a165ef6970c1a	no	13
Warnings:					
Information:					
13	Foreign Reference	JP08-7462.pdf	344643 c219284bd10a8ff998d76accaefa895b92fdeb19	no	6
Warnings:					
Information:					
14	Foreign Reference	JP2000-305845IBM.pdf	649316 c717bf06520ba10eb73c2cd2741229be7bb7a07b	no	9
Warnings:					
Information:					
15	Foreign Reference	JP2000-140948Maezawa.pdf	571523 817100113e5f4e835f3d078087233315182150fc	no	8
Warnings:					
Information:					
16	Foreign Reference	NO14095Nielsen.pdf	93055 b81520a265bffc690deb16fca02a839abdc13fa8	no	2
Warnings:					
Information:					
17	Foreign Reference	WO8600396Kensington.pdf	696162 f323ee48686b5567329e67b3de2e2050fddf619a	no	14
Warnings:					
Information:					
18	Foreign Reference	WO9315295Kensington.pdf	1501080 63a6a176cffcc8dcef6f272af3d8afceeef7e5f5	no	29
Warnings:					
Information:					
19	Foreign Reference	WO9510680Kensington.pdf	2376845 930584d1c9af2f3cbc510e610cb18773c5b318c1	no	45
Warnings:					
Information:					

20	Foreign Reference	WO9607002Kensington.pdf	801821 c1ddb9579688b28ff885936d9036dbf914881692	no	15

Warnings:	
Information:	
Total Files Size (in bytes):	12870217

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : E05B 69/00	A1	(11) International Publication Number: WO 96/15347
		(43) International Publication Date: 23 May 1996 (23.05.96)

(21) International Application Number: PCT/US94/13212

(22) International Filing Date: 15 November 1994 (15.11.94)

(71) Applicant: KENSINGTON MICROWARE LIMITED [US/US]; 2855 Campus Drive, San Mateo, CA 94403 (US).

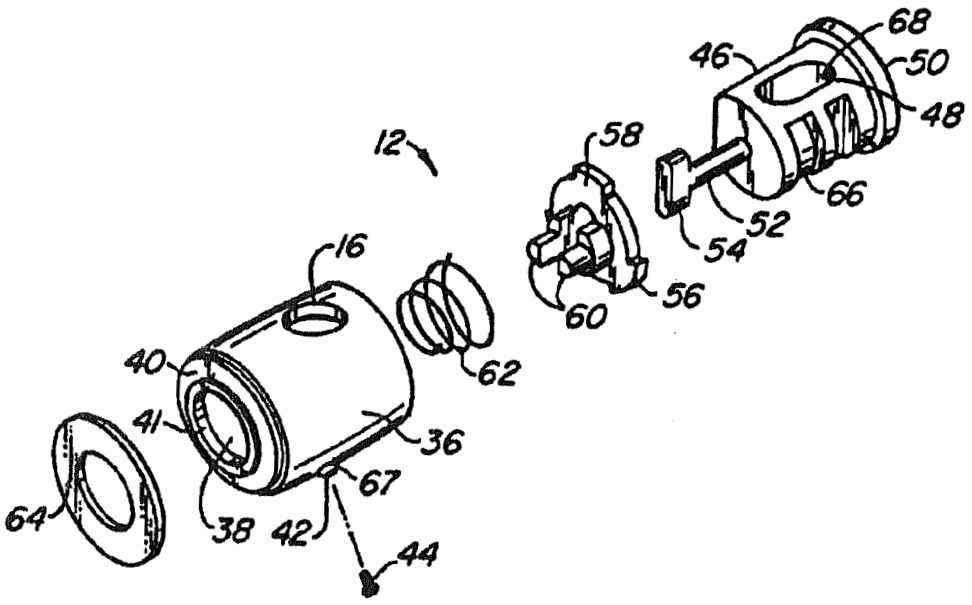
(72) Inventors: MURRAY, William, R., Jr.; 437-D Cork Harbour Circle, Redwood City, CA 94065 (US). CARL, Steward, R.; 533 Addison, Palo Alto, CA 94306 (US). ZARNOWITZ, Arthur, H.; 1249 Capuchino Avenue #2, Burlingame, CA 94010 (US).

(74) Agents: HANN, James, F. et al.; Townsend and Townsend Khourie and Crew, Steuart Street Tower, 20th floor, One Market Plaza, San Francisco, CA 94105-1492 (US).

(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ).

Published
With international search report.

(54) Title: COMPUTER PHYSICAL SECURITY DEVICE



(57) Abstract

An apparatus (fig. 11) for preventing theft of portable equipment like computers is disclosed. The equipment must be provided with a special rectangular slot (fig. 5). An attachment mechanism includes a housing (36) for a spindle (46) having a first portion rotatable within the housing, a shaft (52) extending outwardly from the housing, and a crossmember (54) at the end of the shaft (52) having dimensions conforming to those of the slot. An abutment mechanism (60) also emanates from the housing (36). The combined dimensions of the abutment mechanism (60) and the shaft (52) closely conform to the dimensions of the slot. The crossmember (54) is aligned with the abutment mechanism (60) so that the crossmember (54) can be inserted through the slot with the shaft (52) and the abutment mechanism occupying the slot. The spindle (46) is then rotated 90 degrees to misalign the crossmember (54) with the slot to attach the mechanism. A cable (18) is secured to the housing and to an immovable object.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	**GB**	United Kingdom	**MR**	Mauritania
AU	Australia	**GE**	Georgia	**MW**	Malawi
BB	Barbados	**GN**	Guinea	**NE**	Niger
BE	Belgium	**GR**	Greece	**NL**	Netherlands
BF	Burkina Faso	**HU**	Hungary	**NO**	Norway
BG	Bulgaria	**IE**	Ireland	**NZ**	New Zealand
BJ	Benin	**IT**	Italy	**PL**	Poland
BR	Brazil	**JP**	Japan	**PT**	Portugal
BY	Belarus	**KE**	Kenya	**RO**	Romania
CA	Canada	**KG**	Kyrgystan	**RU**	Russian Federation
CF	Central African Republic	**KP**	Democratic People's Republic of Korea	**SD**	Sudan
CG	Congo			**SE**	Sweden
CH	Switzerland	**KR**	Republic of Korea	**SI**	Slovenia
CI	Côte d'Ivoire	**KZ**	Kazakhstan	**SK**	Slovakia
CM	Cameroon	**LI**	Liechtenstein	**SN**	Senegal
CN	China	**LK**	Sri Lanka	**TD**	Chad
CS	Czechoslovakia	**LU**	Luxembourg	**TG**	Togo
CZ	Czech Republic	**LV**	Latvia	**TJ**	Tajikistan
DE	Germany	**MC**	Monaco	**TT**	Trinidad and Tobago
DK	Denmark	**MD**	Republic of Moldova	**UA**	Ukraine
ES	Spain	**MG**	Madagascar	**US**	United States of America
FI	Finland	**ML**	Mali	**UZ**	Uzbekistan
FR	France	**MN**	Mongolia	**VN**	Viet Nam
GA	Gabon				

COMPUTER PHYSICAL SECURITY DEVICE

This application is a continuation-in-part of Serial No. 08/042,851, filed April 5, 1993, entitled COMPUTER PHYSICAL SECURITY DEVICE, which is a continuation of Serial No. 07/824,964, filed January 24, 1992 (now abandoned), entitled COMPUTER PHYSICAL SECURITY DEVICE, and a continuation-in-part of Serial No. 08/006,311, filed January 19, 1993, entitled COMPUTER PHYSICAL SECURITY DEVICE, all the above applications are hereby expressly incorporated by reference for all purposes.

BACKGROUND OF THE INVENTION

The present invention relates to devices for inhibiting the theft of relatively small but expensive pieces of equipment.

Computers have evolved rather rapidly from large, expensive machines usable only by a few, to relatively small, portable machines which are usable by many. In particular, the development of desk top computers with significant processing power has made computers available to the general population. It is now common for college and even high school students to have their own computer, and desk top computers are in wide spread use as word processors and work stations in almost all forms of business. Desk top computers are relatively small and easily transportable, and an undesirable side effect of their proliferation is the fact that the theft of such computers is a significant problem.

A variety of devices have been developed to inhibit the theft of desk top computers and similar equipment. Since desk top computer systems involve several components, typically including the computer itself, a separate monitor, keyboard and often a printer, such security systems often employ a cable which attaches each of the components to each other and to a relatively immovable object such as a desk. The principal difficulty in such systems is providing an effective and

convenient method for attaching the cable itself to the equipment.

Kensington Microware Limited, assignee of this application, currently provides a security system which is especially designed for use with particular Apple computers. Certain Apple computer components have slots and internal brackets designed to capture a specially designed tab inserted through the slot so that the tab is not removable. While this system is effective for particular types of Apple computers, it does not work for those Apple computer components and other computer brands which do not have the special designed slots and brackets.

It is undesirable to require a computer to have specially designed slots and internal capture brackets because the brackets occupy a significant amount of space in an item of equipment which is intended to be as space efficient as possible. Different items of Apple equipment require different sized slots, meaning that the security mechanism must provide a variety of different sized tabs. The tabs, once inserted, cannot be removed without damage to the equipment, meaning that the security system cannot be moved from one computer to the other. Even Apple computers with specially designed slots are typically used with peripheral equipment which does not have them, and, the Kensington system provides screws requiring a special screwdriver which replace the screws used to attach the existing communication cables, securing the peripheral equipment to the base computer by preventing unauthorized removal of the communication cables. This last aspect of the system has a drawback in that the peripheral equipment cannot be removed from the base computer without the special screwdriver, which can be lost or misplaced.

Other vendors provide security systems which are not required to interface directly with special slots and capture mechanisms as provided in certain Apple computers. For example, Secure-It, Inc., under the trademark "KĂBLIT", provides a variety of brackets attached to the computer component using existing mounting screws, i.e., screws which are already used to secure items of equipment within the

cabinet. Typically, the bracket is apertured so that passage of the cable through the aperture prevents access to the mounting screw and thus prevents removal of the bracket from the equipment. A deficiency of this type of system is that it requires the removal of the existing mounting screw, which may cause some damage to the internal components of the computer. Suitable existing screws are not always available on certain peripherals for convenient attachment of the fastener. For this latter reason, KĂBLIT also provides glue-on disks which, unfortunately, are permanently secured to the equipment.

The theft of small but expensive equipment such as desk top computers is a growing problem. Existing devices are simply too inefficient or ineffective, or their application is too limited. As a result, the use of such security systems is rare, computer equipment is typically left unprotected, and it is all too often stolen.

SUMMARY OF THE INVENTION

The present invention provides apparatus which inhibits the theft of equipment such as personal computers. The equipment must have an external wall provided with a specially designed, approximately rectangular slot having preselected dimensions. An attachment mechanism includes a housing for a spindle having a first portion rotatable within the housing, a shaft extending outwardly from the housing, and a crossmember at the end of the shaft having peripheral dimensions closely conforming to the internal dimensions of the slot. An abutment mechanism also emanates from the housing, and is located on opposite sides of the shaft intermediate the housing and the crossmember. The peripheral cross-sectional dimensions of the abutment mechanism and the shaft in combination closely conform to the dimensions of the slot. The length of the shaft from the housing to the crossmember is approximately equal to the thickness of the external wall of equipment. The crossmember is aligned with the abutment mechanism so that the crossmember can be inserted through the slot with the shaft and the abutment mechanism occupying the slot. The spindle is then rotated 90° to misalign the

crossmember with the slot, thereby attaching the attachment mechanism rigidly to the external wall. A cable is secured to the housing and to an immovable object so that the equipment cannot be stolen.

The apparatus of the present invention is far more adaptable and convenient to use than existing systems. The only required modification of the equipment to be protected is a small (preferably about 3 by 7 millimeter) slot in an external wall. Additional brackets, capture mechanisms or the like are not necessary. This small slot can easily be molded into computer systems at essentially no cost and without degrading the integrity of the equipment. The attachment mechanism can readily be installed on the equipment, and removed when appropriate by an authorized user. In one embodiment, a key-operated attachment attaches a single item of equipment to an immovable object with the cable. In a second embodiment, the cable passes through mating apertures in the spindle and the housing of one or more attachment mechanisms to prevent their removal once they have been attached to the equipment and the cable has been installed.

The attachment mechanism of the present invention is surprisingly difficult to remove from an item of equipment once it has been installed. In the preferred embodiments, the mechanism is quite small, and it is difficult to apply sufficient leverage to break the mechanism away from the equipment to which it is attached. Forcibly removing the mechanism will result in significant, highly visible damage to the exterior wall, identifying the equipment as stolen and making it difficult to resell, greatly reducing its theft potential.

Several alternative embodiments of the invention are provided in which there are shown several different combinations of attachment mechanisms which are either integrally connected or separately coupled to engagement mechanisms for securing the attachment mechanism proximate the external wall of the object of equipment. Further embodiments of the invention provide an attachment mechanism that can be directly coupled to the external wall of the object of

equipment without the need to provide a specially designed slot in the wall.

The novel features which are characteristic of the invention, as to organization and method of operation, together with further objects and advantages thereof will be better understood from the following description considered in connection with the accompanying drawings in which a preferred embodiment of the invention is illustrated by way of example. It is to be expressly understood, however,that the drawings are for the purpose of illustration and description only and are not intended as a definition of the limits of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a first embodiment of the present invention attached to a computer monitor;

Fig. 2 is a perspective view of a second embodiment of the present invention attached to a computer keyboard;

Fig. 3 is a perspective view of the attachment mechanism of the first embodiment;

Fig. 4 is an exploded view of the attachment mechanism of Fig. 3;

Fig. 5 is a fragmentary elevation view of a slot in a piece of equipment specially designed to accept the attachment mechanism of either embodiment of the present invention;

Fig. 6 is a section view taken along lines 6-6 of Fig. 3;

Fig. 7 is a section view taken along lines 7-7 of Fig. 3;

Fig. 8 is a fragmentary section view from inside an item of equipment illustrating insertion of a crossmember of the embodiment of Fig. 3 into the slot of Fig. 5;

Fig. 9 is a view similar to that of Fig. 8 with the crossmember misaligned;

Figs. 10A and B are elevation views illustrating the installation of the attachment mechanism of Fig. 3 on an item of equipment;

Fig. 11 is a perspective view of the attachment mechanism of the second embodiment of the present invention;

Fig. 12 is an exploded view of the attachment mechanism of Fig. 10;

Figs. 13A and 13B are side elevation views illustrating the installation of the attachment mechanism of Fig. 11 on an item of equipment;

Figs. 14 and 15 are side elevational views of alternative embodiments of an attachment mechanism and an engagement mechanism;

Figs. 16A and 16B are respective perspective views of another alternative embodiment of an attachment mechanism and an engagement mechanism of the invention;

Fig. 16C is a side elevational view of the attachment mechanism and the engagement mechanism of Figs. 16A and 16B assembled together proximate the external wall of an item of equipment;

Fig. 17A is a side elevational view of another embodiment of the invention;

Fig. 17B is a corresponding perspective view of the embodiment of Fig. 17A;

Fig. 18 is a side elevational view of a slightly modified version of the embodiment of Figs. 17A and 17B showing a threaded engagement between the spindle and the housing;

Fig. 19 is a perspective view of another slightly modified version of the embodiment of Figs. 17A and 17B showing a pin and pin hole engagement between the attachment mechanism and the external wall of an item of equipment;

Figs. 20A, 20B, and 20C are perspective views of component parts of another embodiment of the invention showing a separate attachment mechanism, housing, and engagement mechanism respectively;

Fig. 20D is perspective view of the embodiment of Figs. 20A, 20B, and 20C showing the three component parts in an assembled configuration;

Figs. 21A and 21B are perspective views of component parts of another embodiment of the invention showing an engagement mechanism and a separate attachment mechanism respectively;

Fig. 21C is a side elevational view of the embodiment of Figs. 21A and 21B with the engagement mechanism coupled to the attachment mechanism;

Figs. 22A and 22B are perspective views of slightly modified version of the respective component parts of Figs. 21A and 21B;

Fig. 22C is a side elevational view of the embodiment of Figs. 22A and 22B with the attachment mechanism shown coupled to a slot in the external wall of an item of equipment;

Fig. 23A is a side elevational view of an attachment mechanism coupled to an engagement mechanism according to another embodiment of the invention;

Fig. 23B is a perspective view of the embodiment of Fig. 23A with the attachment mechanism and engagement mechanism shown coupled to a cable and a separate locking device;

Fig. 24A is a perspective view of the attachment mechanism of Figs. 23A and 23B which can be directly coupled to an external wall of an item of equipment;

Fig. 24B is a perspective view of another embodiment of the attachment mechanism of Figs. 23A and 23B which can be directly coupled to an external wall with the use of an adhesive;

Fig. 25 is another embodiment of an attachment mechanism which can be directly coupled to an external wall of an item of equipment;

Fig. 26A is a perspective view of another embodiment of the present invention with a conventional lock assembly and a retractable spindle;

Fig. 26B is a perspective view of the spindle and lock assembly of Fig. 26A showing the spindle in its retracted position; and

Fig. 27 is perspective view of another embodiment of the preferred embodiment including a base unit and an attachment unit.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

A first preferred embodiment 10 of the security device of the present invention is illustrated generally by way

of reference to Fig. 1. Security device 10 includes an attachment mechanism 12 designed to attach to a component of a computer system, such as computer monitor 14. Attachment mechanism 12 has an aperture 16, and a cable 18 which passes through the aperture when the attachment mechanism 12 is attached to a component such as monitor 14. A lock 20 is fixed to one end of cable 18. The free end of cable 18 may be of the type having a "mushroom" head 22 adapted to penetrate and be secured within lock 20 using key 24. With mushroom head 22 detached from lock 20, cable 18 can be threaded through the apertures 16 of one or more attachment mechanisms 12, and wrapped around a relatively immovable object (not shown) such as the cross bar spanning two legs of a desk. Mushroom head 22 is then inserted into lock 20 and the lock closed using key 24 to secure the computer components to the immovable object.

A second embodiment 26 of the present invention, designed primarily to secure single rather than multiple items of computer equipment, is illustrated generally by way of reference to Fig. 2. Embodiment 26 includes an attachment mechanism 28 designed to be secured to a computer component such as keyboard 30. Attachment mechanism 28 is affixed to one end of a cable 32 which has a closed loop 34 at its other end. Cable 32 is first wrapped around a relatively immovable object, such as a cross piece between two legs of a desk or table, and attachment mechanism 28 is passed through loop 34 and attached to the item to be protected such as keyboard 30 to make it difficult to steal the item of equipment.

Attachment mechanism 12 of first embodiment 10 is illustrated in more detail by way of reference to Figs. 3 and 4 in combination. Mechanism 12 includes a housing 36 having a hollow interior cylindrical cavity 38. An annular plate 40 forms one end of housing 36 and has an aperture 41. A pair of apertures such as aperture 16 are located on opposite sides of housing 36. A small raised aperture 42 is also provided in housing 36 to accommodate a pin 44, as explained in more detail hereinafter.

A spindle 46 includes a cylindrical portion 48 adapted to fit within the cylindrical cavity of housing 36.

Spindle 48 includes a raised plate 50 at one end which forms the aft end of the mechanism when assembled as illustrated in Fig. 3. Spindle 46 also includes a shaft 52 extending outwardly through the aperture 41 in housing 36. A crossmember 54 is located on the distal end of shaft 52.

An abutment mechanism 56 includes an abutment plate 58 designed to be received within the cylindrical interior cavity of housing 36, and a pair of pins 60 adapted to extend outwardly through the aperture 41 in housing 36. A spring 62 biases abutment plate 58 and spindle 46 rearwardly when the mechanism is assembled, as illustrated in Fig. 3. A plastic bushing 64 designed to prevent scarring of the equipment to which mechanism 12 is attached is affixed to the plate 40 on housing 36 circumscribing aperture 41.

When mechanism 12 is assembled as illustrated in Fig. 3, crossmember 54 and shaft 52, together with pins 60 on either side of the shaft, extend outwardly beyond housing 46 through aperture 41. Pin 44 engages a groove 66 in spindle 46 so that the mechanism cannot be disassembled without removing the pin. The head of pin 44 is conformed to the shape of a boss 67 on the surface of housing 36 so that the pin cannot be removed without special equipment. Groove 66 has a preselected width allowing limited axial movement of spindle 46 relative to housing 36 with pin 44 engaged so that the axial position of crossmember 54 relative to the housing is somewhat adjustable. Spring 62 biases plate 58 and spindle 46 rearwardly to bias crossmember 54 toward housing 36.

Groove 66 extends around about 25% of the periphery of spindle 46 so that the spindle can be rotated approximately 90° relative to the housing. A transverse aperture 68 through the cylindrical portion 48 of spindle 46 is aligned with aperture 16 in housing 36 when crossmember 54 is misaligned from pin 60 (see Fig. 4). With spindle 46 rotated 90°, as allowed by pin 44 in groove 68, crossmember 54 is aligned with pin 60, and aperture 68 is not aligned with aperture 16. Cable 18 (see Fig. 1) can only be inserted through the aligned apertures 16, 68 when crossmember 54 is misaligned with pins 60, i.e., when attachment mechanism 12 is attached to the piece

of equipment, as explained hereinbelow. With cable 18 passing through aligned apertures 16 and 68, rotation of spindle 46 so as to align crossmember 54 with pins 60 and allow removal of the attachment mechanism is effectively prevented.

The preferred embodiments 10 and 26 of the present invention are designed to operate with items of equipment provided by a special slot, as illustrated in Fig. 5. The exterior wall 70 of the piece of equipment is typically made of sheet metal, or molded plastic, either of which is compatible with the present invention. A relatively small slot 72 is formed in wall 70, by molding or otherwise as appropriate. In the preferred embodiment of slot 72, the slot has a generally rectangular configuration, i.e., the slot is generally rectangular having long parallel sides 74, short parallel sides 75 and rounded corners 76. Slot 72 is relatively small, having a long dimension 78 of seven millimeters, and a short dimension 79 of three millimeters, in the preferred embodiment of the present invention. Corners 76 have a radius of curvature 90 from 0.30 mm. to a maximum of 1.5 millimeters. If the radius of curvature 90 is 1.5 mm., the short sides 75 disappear and the slot has a straight-sided oval configuration.

The peripheral dimensions of crossmember 54 are closely conformed to the interior dimensions of slot 72, as illustrated in Fig. 6. The crossmember 4 of attachment mechanism 12 has a straight-sided oval configuration, i.e., the crossmember is generally rectangular, having straight sides and semi-circular ends. In the preferred embodiment, the long dimension 82 of crossmember 54 is 6.75 millimeters, while the short dimension 83 is 2.75 millimeters, each being slightly less than the corresponding dimension of slot 72. As illustrated in Fig. 7, the peripheral dimensions of the pins 60 and shaft 52 also closely conform to the interior dimensions of slot 72. As with crossmember 54, pins 60 in shaft 52 have a long dimension 84 of 6.75 millimeters, and a short dimension 85 of 2.75 millimeters.

The insertion of crossmember 54 of attachment mechanism 12 into slot 72 of external wall 70 is illustrated by reference to Figs. 8 and 10A. Before insertion, spindle 46

must be rotated so that crossmember 54 is aligned with pins 60, as illustrated in Fig. 3. With the spindle in this position, the periphery of crossmember 54 and that of pins 60 and shaft 52 are essentially congruent. Since the peripheral dimension of crossmember 54 and pins 60 and shaft 52 in combination are less than the dimensions of slot 72, the crossmember can be inserted through the slot until crossmember 54 is completely inside wall 70 (see Fig. 10A). If necessary, the plate 50 on spindle 46 can be pressed to compress spring 62 so that crossmember 54 is completely inside wall 70.

As illustrated in Fig. 9, upon insertion of crossmember 54 completely through slot 72, the spindle is rotated by manipulating plate 50 so that crossmember 54 is 90° misaligned with respect to pins 60. The aperture 16 in the side wall of housing 36 will be aligned with the aperture 68 in the spindle, providing a passageway completely through the housing. In this configuration, cable 18 can easily be threaded through the aperture, and the presence of the cable prevents the spindle from being rotated back so as to disengage crossmember 54 from slot 72.

The attachment mechanism 28 of the second embodiment 26 of the present invention is illustrated in more detail by way of reference to the perspective view of Fig. 11 and the exploded view of Fig. 12. Attachment mechanism 28 includes a hollow shell 90 and a nose-piece 92 which, in combination, form a housing. Shell 90 has a hollow cylindrical interior cavity 94, and an integral apertured plate 96 at one end. A pin 98 is inserted through an aperture (not shown) in nose-piece 92 to engage a slot 102 in shell 90. Pin 98 is designed to shear when torque is applied to nose-piece 92 so that an unauthorized attempt to remove the attachment mechanism will simply shear the pin and allow the nose-piece to freely rotate without degrading the attachment of the attachment mechanism to the component to be protected. Slot 102 is axially elongate so that limited axial movement is allowed between shell 90 and nose-piece 92. The forward end of nose-piece 92 has a plate 93 having a central aperture 95.

A cylindrical collar 106 circumscribes the outer portion of shell 90 and occupies the slot laterally defined by plate 96 and the aft surface 108 of nose-piece 92. Collar 106 has an integral tab 110 with an aperture 112 adapted to receive one end of cable 32. Cable 32 is dead-ended into tab 110 and attached so that it cannot be removed.

A spindle 114 has a cylindrical portion 116 adapted to be received within a cylindrical lock 118 in shell 90. Cylindrical lock 118 includes a front cylinder 119, and a back cylinder 120. A blunt pin or set screw 121 is inserted through an aperture 125 in shell 90, and through a corresponding aperture 123 in back cylinder 120, to lock the front cylinder rotationally with respect to shell 90. Correspondingly, pin or set screw 127 engages a relatively smaller aperture 129 in front cylinder 119, and a widening 131 in slot 133 in the cylindrical portion 116 of spindle 114. Front cylinder 119 is thus fixed rotationally with respect to spindle 114.

As with conventional cylindrical locks, a plurality of pins normally span the interface between front cylinder 119 and back cylinder 120 so that the cylinders are rotationally locked together, thus preventing relative rotation between locking shell 90 and spindle 114. However, a key 140 (see Fig. 13B) is insertable through the apertured plate 96 of shell 90 to engage front cylinder 119. The correct key will have bosses located to depress the pins passing between cylinders 119 and 120 so that such pins do not span the interface between the cylinders, allowing the cylinders to rotate with respect to one another. In this fashion, spindle 114 can be rotated with respect to shell 90 only upon insertion and rotation of the appropriate key.

Spindle 114 also includes a shaft 122, and a crossmember 124 at the free end of the shaft. An abutment mechanism 126 has an abutment plate 128 adapted to fit within nose-piece 92, and a pair of pins 130 adapted to extend outwardly through aperture 95. A spring 132 is located between abutment plate 128 and nose-piece 92 to bias the cylindrical portion 116 of spindle 114 and the abutment plate rearwardly. Abutment plate 126 has an elongate aperture 134 which allows

crossmember 124 to extend through the aperture plate. A plastic bushing 136 is fixed to the surface of plate 93 so that the mechanism does not scar the equipment to which it is attached.

The insertion of attachment mechanism 28 into the exterior wall 137 of a piece of equipment is illustrated by way of reference to Figs. 13 A and B. Wall 136 has a slot 138, which is identical to the slot 72 illustrated in Fig. 8. The peripheral dimensions of crossmember 124, and also those of pins 130 and shaft 122 in combination, are identical to the corresponding parts in Figs. 6 and 7. Simply put, attachment mechanism 28 is designed to fit into the same slot as attachment mechanism 12.

As illustrated in Fig. 13A, crossmember 124 is aligned with pins 30 so that the crossmember can be inserted into slot 138. When fully inserted, the space in the slot is essentially occupied by pins 130 and shaft 122. If necessary, plate 96 can be depressed to push the cylindrical portion 116 of spindle 114 against spring 132. Once crossmember 124 has been fully inserted through slot 138, a key 140 engaging lock mechanism 118 (see Fig. 12) is used to rotate the spindle 90° and misalign crossmember 124 and slot 138.

In operation, both attachment mechanism 12 and attachment mechanism 28 are attached to an item of computer or other equipment which has a specially designed slot 72, 138. First, the crossmember 54, 124 is aligned with the pins 60, 130, for insertion to the crossmember through the slot. The spindle 46, 114 is then rotated relative to the housing to misalign the crossmember 54, 124 relative to the slot. The spindle is locked in this configuration by passing the cable 18 through the mating slot 16, 48 in the first embodiment, or using the key 140 in the second embodiment. Either way, the attachment mechanism is extremely difficult to disengage by anyone not having the appropriate key 24, 140. Any unauthorized attempt to remove the attachment mechanism from the computer component will most likely result in significant damage to the computer housing, making the computer difficult to resell and greatly reducing its theft potential.

Fig. 14 illustrates another embodiment of the invention. Security device 200 includes an attachment mechanism 201 designed to be attached to a portable object of equipment, such as a personal computer (not shown), having an external wall 250. Attachment mechanism 201 comprises a housing 202 which generally includes a top end 204, a bottom end 208, and a generally cylindrical side wall 206, which in combination define internal hollow cavity 210. Side wall 206 has a pair of apertures 212 which are aligned with one another and which are sized to allow a cable 242 to pass through the apertures. Top end 204 is provided with an opening 214 which extends to proximate bottom end 208 to provide access for screw 230 into cavity 210, as will be described in more detail hereinafter. A raised plate 218 having a threaded aperture 216 is provided in bottom end 208 of the housing to accommodate insertion of screw 230.

Integral with bottom end 208 of housing 202 is an engagement mechanism 220 which includes a generally cylindrical shaft 222 and a crossmember 224 attached to the shaft at the distal end of the shaft. As previously described with reference to prior embodiments of the invention, the peripheral dimensions of the crossmember conform closely to the internal dimensions of slot 252. The crossmember 224 is generally rectangular, having straight sides and semi-circular ends, as previously described.

To secure attachment mechanism 201 proximate external wall 250, housing 202 must first be rotated prior to insertion of screw 230 so that crossmember 224 is aligned with slot 252. Since the peripheral dimensions of crossmember 224 and shaft 222 are less than the dimensions of slot 252, crossmember 224 can be inserted through the slot until the crossmember is completely inside external wall 250, with shaft 222 occupying a portion of slot 252. Housing 202 may then be rotated by grasping onto side wall 206 and turning housing 202 until crossmember 224 is 90 degrees misaligned with respect to the slot. In this position of the crossmember, screw 230 can be inserted through opening 214 in the housing and threaded into aperture 216 in raised plate 218 of the housing. With screw

head 232 firmly pressed against the upper surface of plate 218, a length of the screw 234 external the housing will extend beyond the housing for a distance that is slightly greater than the thickness of external wall 250. Further, the peripheral dimension of the screw portion 234 and the shaft 222 in combination is slightly less than the dimensions of the slot. In this way, screw portion 234 and shaft 222 occupy slot 252 when the screw is threadably engaged with aperture 216 in the housing so as to prevent rotation of the housing relative to the external wall and thereby prevent disengagement of crossmember 224 from slot 252. In this configuration, cable 242 can easily be threaded through apertures 212 to secure the housing to an external object (not shown). Once the cable is inserted through apertures 212 in the housing, screw 230 cannot be removed.

Fig. 15 illustrates another embodiment of the invention which has a similar configuration to the embodiment of Fig. 14 except that a spindle 260 is used instead of a screw to prevent rotation of housing 202'. Spindle 260 includes a cylindrical portion 264 adapted to be rotatably mounted within the cylindrical cavity 210' of the housing. An aperture 268 is formed through cylindrical portion 264 and is sized to allow a cable (not shown) to pass through the aperture. Spindle 260 includes a raised plate 266 at a proximal end of the spindle which forms the aft end of the spindle. Spindle 260 also includes a pin member 270 extending outwardly through aperture 216' in housing 202'. The length of the pin member 272 external the housing is slightly greater than the thickness of external wall 250.

In operation, with the crossmember misaligned from the slot as described above with reference to the embodiment of Fig. 14, spindle 260 is positioned in the housing so that base pin 270 is inserted through aperture 216' and into slot 252 proximate shaft 222'. The peripheral dimension of the shaft and the pin in combination is less than the dimension of the slot so that the pin and shaft occupy the slot with the crossmember misaligned 90 degrees. In this position, spindle 260 is rotated by manipulating raised plate 266 so that

apertures 212' in the side wall 206' of housing 202' will be aligned with aperture 268 in cylindrical portion 264 of the spindle, providing a passageway completely through the housing. In this configuration, a cable (not shown) can easily be threaded through the apertures, and the presence of the cable prevents spindle 260 from being separated from the housing.

Figs. 16A, 16B and 16C illustrate another embodiment of the invention in which the attachment mechanism 300 is a separate component from the engagement mechanism 320. Attachment mechanism 300 comprises a housing 302 having a top end 304, a bottom end 308, spaced apart side walls 306, and a peripheral edge wall 309, as seen in an inverted configuration in Fig. 16A. Bottom end 308 includes a generally rectangular opening 310 which extends the length of the housing to closed top end 304. Opening 310 is configured to permit passage of engagement mechanism 320 into housing 302, as will be described in more detail hereinafter. Apertures 312 through side wall 306 are spatially coupled to opening 310 and are sized to allow a cable (not shown) to pass through the apertures. Housing 302 also preferably includes first and second springs 316L and 316R mounted on either side of bottom end 308 of the housing which are used to adjust the relative position of the housing proximate the external wall 350, as best seen in Fig. 16C. Housing 302 further includes first and second, spaced apart abutment plates 314L and 314R located on opposite sides of opening 310.

Engagement mechanism 320, which is configured to fit within housing 302 through opening 310, is shown by way of reference to Fig. 16B and generally includes a spindle 322. Spindle 322 has an upper portion 324 which includes aperture 326 sized to permit passage of a cable (not shown) through aperture 326. Connected to the distal end of upper portion 324 of the spindle is a shaft 328 which has generally rectangular crossmember 330 attached to the shaft at the distal end of the shaft. The dimensions of the crossmember conform closely to the dimensions of the slot 352, as previously described. Engagement mechanism also preferably includes a spring 332 located around the periphery of shaft 328.

In operation, crossmember 330 is aligned with slot 352 and is inserted therein until crossmember 330 is completely inside external wall 350, as seen in Fig. 16C. If necessary, the upper portion 324 of spindle 322 can be firmly pressed to compress spring 332 so that crossmember 330 is completely inside wall 350.

Upon insertion of crossmember 330 completely through slot 352, spindle 322 is rotated so that crossmember 330 is 90 degrees misaligned with slot 352. In this configuration, housing 302 is placed over the spindle 322, so that the spindle is received within opening 310 in the housing. Abutment plates 314L and 314R are inserted into the slot on both sides of shaft 328 extending from spindle 322. With the upper portion 324 of the spindle completely received within the housing, aperture 326 in spindle 322 will be aligned with apertures 312 in housing 302, providing a passageway completely through the housing. In this configuration, a cable (not shown) can be easily threaded through the apertures, and the presence of the cable secures the spindle to the housing. As best seen in Fig. 16C, the peripheral dimension of the abutment plates 314L, 314R and shaft 328 of the spindle in combination closely conform to the dimensions of the slot and thereby occupy the slot. In this way, the housing is fixed relative to the spindle and neither can be rotated back so as to disengage crossmember 330 from slot 352. Springs 316L, 316R are biased against the lower end of the housing to firmly secure housing 302 proximate the external wall 350.

Another embodiment of the invention is shown by way of reference to Figs. 17A and 17B in which a spindle 420, a housing 402, and a spring 440 are assembled to operate as a single unit. Attachment mechanism 400 comprises housing 402 which generally includes top end 404, bottom end 406, and cylindrical side wall 408, which in combination define internal cylindrical cavity 409. A cylindrical opening 412 in the top end 404 of the housing extends to proximate closed bottom end 406 of the housing and is configured to allow engagement mechanism 420 to be rotatably mounted within the housing. Side wall 408 has a pair of apertures 410 which are sized to allow

passage of a cable (not shown) through the apertures. Attached to bottom end 406 of the housing are two abutment plates 414L and 414R which are spaced apart from aperture 416 in bottom end 406 and which are adapted to be inserted into slot 452 in external wall 450 (See Fig. 17B).

Spindle 420 includes a cylindrical portion 424 rotatably mounted within the cylindrical cavity 409 of housing 402. Spindle 420 includes a raised plate 423 at one end which forms the aft end of the spindle. Spindle 420 also includes a shaft 428 extending outwardly through aperture 416 in housing 402. A crossmember 430 is located at the distal end of shaft 428. Aperture 426 through cylindrical portion 424 of the spindle 420 is sized to allow a cable (not shown) to pass through aperture 426. A spring 440 is located at the distal end of cylindrical portion 424 of the spindle and biases the spindle away from the bottom end of housing 402 so that crossmember 430 will firmly engage the inner surface of external wall 450, as will now be described.

When the apparatus is assembled as illustrated in Fig. 17A, crossmember 430 and shaft 428, together with abutment plates 414L and 414R on either side of the shaft, extend outwardly beyond the bottom end 406 of housing 402. Prior to insertion of crossmember 430 into slot 452, spindle 420 must be rotated via raised plate 423 so that crossmember 430 is aligned with slot 452, as seen in Fig. 17B. With the spindle in this position, the crossmember can be inserted through the slot as previously discussed. If necessary, plate 423 can be pressed to compress spring 440 so that crossmember 430 is completely inside wall 450. In this position of the crossmember, shaft 428 and abutment plates 414L, 414R occupy the slot to prevent rotation of the housing relative to external wall 450.

Upon insertion of crossmember 430 completely through slot 452, the spindle is rotated by manipulating plate 423 so that crossmember 430 is 90 degrees misaligned with slot 452. Side wall 408 of housing 402 preferably includes at least one small hole 411 on either side of the housing through which a pin 460 engages a groove (not shown) in the cylindrical portion

424 of the spindle, the groove extending around about 25% of the periphery of cylindrical portion 424 so that the spindle can be rotated substantially only 90 degrees relative to the housing. With the crossmember misaligned from the slot, apertures 410 in the side wall of housing 402 will be aligned with aperture 426 in the spindle providing a passageway completely through the housing. In this configuration, a cable (not shown) can easily be threaded through the aligned apertures, and the presence of the cable prevents the spindle from being rotated back so as to disengage crossmember 430 from slot 452.

The embodiment of Figs. 17A and 17B can be slightly modified to provide a threaded cylindrical portion 424' of the spindle 420', as seen in Fig. 18. In this embodiment, the internal peripheral surface 413 of side wall 408' is also threaded so that the cylindrical portion 424' engages threaded surface 413. This engagement variation between spindle 420' and housing 402' can be used instead of spring 440 in Fig. 17A to adjust the relative lateral displacement between the spindle and the housing.

Fig. 19 illustrates another alternative embodiment of a housing 402" which is used to prevent rotation of the housing relative to the external wall 450 when the crossmember is misaligned with the slot. In this embodiment, pins 472 are mounted to the outer surface of the external wall on either side of slot 452 and engage pin holes 470 located on opposite sides of shaft 428" to prevent rotation of the housing relative to external wall 450 when crossmember 430" is located completely within slot 452 and is misaligned from the slot.

Other embodiments of the invention are described with reference to Figs. 20-23 wherein the engagement mechanism includes at least two engagement portions for engaging with the inner surface of the external wall proximate the slot to prevent removal of the attachment mechanism from proximate the external wall.

Figs. 20A, 20B, 20C and 20D illustrate another embodiment of the invention 600 including three separate components, an attachment mechanism 602 (see Fig. 20A), a

housing 620 (see Fig. 20B), and a separate engagement mechanism 640 (see Fig. 20C). Attachment mechanism 602 includes attachment member 603 shown in an inverted position in Fig. 20A. Attachment member 603 generally includes a top end 604, a bottom end 606, spaced apart side walls 608, and a peripheral edge wall 609. An aperture 610 is provided through side walls 608 and is sized to permit passage of a cable (not shown) through aperture 610. Base portion 612 is integrally connected to attachment member 603 proximate bottom end 606 of the attachment member. A retaining flange 614 is provided proximate top end 604 to retain attachment member 603 within housing 620, as will be described in more detail hereinafter.

Housing 620 is shown by way of reference to Fig. 20B and generally includes a top wall 622, a bottom wall 624, and four separate spaced apart side walls including a front end 626 and a back end 628. A pair of substantially rectangular openings 632 are provided through both top wall 622 and bottom wall 624 of the housing and are configured to allow passage of the attachment member 603 through openings 632. A separate, generally rectangular aperture 630 is provided in front end 626 of housing 620 and extends the length of the housing to the closed back end 628. Aperture 630 is configured to permit passage of engagement mechanism 640 into the aperture, as will be described in more detail hereinafter. Bottom wall 624 is also provided with a pin hole 636 proximate front end 626 which is sized to receive a retaining pin 634 therein. The housing is preferably made from cast metal, but any other suitable material may be used.

Engagement mechanism 640 is shown by way of reference to Fig. 20C and includes an engagement member 642. Engagement member 642 includes first and second, spaced apart engagement arms 646L, 646R which have first and second engagement portions 648L, 648R integrally connected to the arms at the distal end of arms 646L, 646R. A transverse member 644 connects the two engagements arms 646L, 646R together at the proximal end of the arms and defines an abutment surface 645 located towards the distal end of transverse member 644. Engagement arms 646L, 646R and transverse member 644 in combination define clearance

space 649 which is sized to permit passage of attachment member 603 through clearance space 649, as will now be described.

To assemble device 600 prior to securing the device proximate external wall 650, engagement member 642 is initially inserted into rectangular aperture 630 in housing 620 until transverse member 644 abuts against back end 628 of the housing. Retaining pin 634 is subsequently inserted into pin hole 636 in the housing and secured thereto so that engagement member 642 cannot be removed from the housing without removing the pin. Attachment member 603 is then inserted into rectangular openings 632 in the housing and through clearance space 649 of the engagement member so that the attachment member extends outwardly through opening 632 in bottom wall 624 of the housing. Base portion 612 of the attachment member engages the upper surface of top wall 622 of the housing to prevent passage of attachment member 603 completely through housing 620. Retaining flange 614 prevents attachment member 603 from being separated from the housing. Further, abutment surface 645 of transverse member 644 engages with attachment member 603 to secure engagement member 642 to attachment member 603.

When device 600 is assembled as illustrated in Fig. 20D, engagement portions 648L, 648R and a lower portion of engagement arms 646L, 646R extend outwardly beyond front end 626 of housing 620. In this configuration, engagement portions 648L, 648R may be pressed firmly against slot 652 until the engagement portions bend sufficiently inward to fit within slot 652. The inwardly sloped peripheral dimensions of the engagement portions permit easier access into slot 652. Upon insertion of engagement portions 648L, 648R completely within the slot, with a portion of the engagement arms 646L, 646R occupying the slot, the arms will spread back to their natural configuration and thereby engage the internal surface of the external wall 650 proximate slot 652 to secure the device 600 proximate the external wall. A cable (not shown) can then be inserted through aperture 610 in attachment member 603, and the presence of the cable prevents the attachment member 603 from moving relative to housing 620.

Figs. 21A, 21B, and 21C depict another embodiment of the invention, device 700, in which there are two major component parts, attachment mechanism 701 and engagement mechanism 720.

Attachment mechanism 701 of Fig. 21B generally includes an attachment member 702 having a closed top end 704, a bottom end 706, a peripheral edge wall 709, and spaced apart side walls 708. An aperture 710 is provided through side walls 708 and is sized to permit a cable to pass through aperture 710. A generally rectangular opening 712 is further provided in bottom end 706 of attachment member 702 and extends the length of the attachment member to closed top end 704. Opening 712 is configured to accommodate passage of the engagement mechanism 720 into opening 712, as will be described in more detail hereinafter.

Engagement mechanism 720 is shown by way of reference to Fig. 21A and generally includes engagement member 722 having first and second, spaced apart engagement arms 724L and 724R connected at the proximal end of engagement member 702 and defining a clearance space 725 between the arms sized large enough to permit a cable to pass through clearance space 725. Abutment surface 730 is located adjacent the proximal end of the engagement arms. Engagement portions 726L, 726R are integral with engagement arms 724L, 724R at the distal end of the arms. A pair of grooves 728 is provided in engagement portions 726L, 726R, with the length of the groove being substantially equal to the thickness of external wall 750 (See Fig. 21C). Engagement member 722 is preferably injection molded and made from a plastic material to enhance its resiliency. However, it is to be noted that the engagement member may be made from other materials, such as metal, provided that the material is sufficiently resilient to allow engagement arms 724L, 724R to be bent inward sufficiently far enough to allow engagement portions 726L, 726R to be inserted into slot 752.

To utilize device 700, engagement arms 724L, 724R are pressed towards one another so that engagement portions 726L, 726R are positioned sufficiently close to one another to allow

the engagement portions to be inserted into slot 752. As seen in Fig. 21C, grooves 728 engage with external wall 750 when engagement portions 726L, 726R are within slot 752 and have spread back to their natural configuration. In this way, engagement member 722 is firmly secured to external wall 750. Subsequently, attachment member 702 is positioned over engagement member 722 until clearance space 725 is aligned with aperture 710 in the housing. In this configuration, a cable 740 can easily be threaded through aperture 710 in the housing and clearance space 725, and the presence of the cable 740 prevents attachment member 702 from being separated from engagement member 722.

Figs. 22A, 22B, and 22C illustrate a slightly modified version of the embodiment of Figs. 21A, 21B, and 21C. In this embodiment, housing 702' preferably includes a retaining pin hole 714. Engagement mechanism 720' is also slightly modified to include a retaining pin 734 which engages with pin hole 714 proximate bottom end 706' of housing 702' to prevent engagement member 722' from being separated from housing 702' prior to insertion of a cable (not shown). Side walls 732L, 732R forming part of alternative engagement portions 726L', 726R' will spread back to their natural configuration once inserted into slot 752 to thereby engage the inner surface of external wall 750 proximate the slot to affix the engagement member to the external wall. Engagement member 722' of Figs. 22A and 22C is adapted to engage with a slot having substantially smaller peripheral dimensions than the slot necessary to engage with engagement member 722 of Fig. 21A.

Figs. 23A and 23B illustrate another embodiment of the invention 800 in which there are also substantially only two component parts, an attachment mechanism 801 and an engagement mechanism 820. Attachment mechanism 801, shown by way of reference to Fig. 23A, generally includes an attachment member 802 having a top end 804, a bottom end 806, and a cylindrical side wall 808. A pair of apertures 810 are provided through side wall 808 and are sized to permit a cable 840 to pass through apertures 810 (See Fig. 23B). A generally

cylindrical opening 812 is further provided in top end 804 of attachment member 802 and extends the length of the attachment member to a substantially smaller screw opening 814 in bottom end 806 of the attachment member. Opening 812 is configured to accommodate passage of screw 816 through opening 812 to bottom end 806 of the attachment member, as will be described in more detail hereinafter.

Engagement mechanism 820 is used in conjunction with attachment member 802, as is also illustrated in Fig. 23A. Engagement mechanism 820 generally includes engagement member 822 having first and second, spaced apart engagement arms 824L and 824R connected to base portion 830 at the proximal end of engagement member 822 and defining a clearance space 825 between the arms sized large enough to permit screw 816 to pass through clearance space 825. Base portion 830 has a top surface 833 and a bottom surface 831 and is provided with a screw hole 832 through the surfaces. Engagement portions 826L, 826R are integral with engagement arms 824L, 826R at the distal end of the arms. In the preferred embodiment of device 800, engagement portions 826L, 826R have inwardly sloped side walls which facilitate insertion of the engagement portions into slot 852, as previously described.

In operation, engagement portions 826L, 826R are inserted into slot 852 until lower surface 831 of base portion 830 engages the outer surface of external wall 850. In this position of engagement member 822, attachment member 802 is positioned proximate upper surface 833 of base portion 830 until screw hole 832 is aligned with opening 814 in the attachment member. Screw 816 is then inserted through each of opening 812 in the attachment member, opening 814 at the bottom end 806 of the housing, hole 832 in base portion 830, and clearance space 825. The screw will force engagement arms 824L, 824R to spread apart so that engagement portions 826L, 826R will engage the inner surface of external wall 850 proximate slot 852. In this configuration, cable 840 (See Fig. 23B) can be threaded through apertures 810 in the attachment member and attached to an external object, such as lock 860, to

secure the attachment member to the lock. The cable will also prevent removal of screw 816.

It is to be understood that an attachment member 802' can be used independently of engagement mechanism 820 provided that an appropriate screw hole or screw insert is provided in the external wall (not shown) sized to permit screw 816' to engage with the hole (or insert), as is apparent from Fig. 24A. Further, an attachment member 802" may also be secured to an external wall by any other suitable engagement means, as for example providing a double-sided adhesive pad 870 for engaging both the bottom end of the attachment member 802" and the outer surface of the wall (not shown), as seen in Fig. 24B.

In still another embodiment of the same device 800, attachment member 802"' can be hingably connected to a base portion 818 having a screw hole 814"' so that the attachment member 802"' will swing away from the external wall when not in use, as seen in Fig. 25. In this embodiment, base portion 818 may be secured proximate the external wall of an item of equipment via screw 816"' and a threaded insert 819.

The attachment mechanism concept of Figs. 23A and 23B can also be modified to include a conventional lock assembly 910 (as previously described by way of reference to the embodiment of Fig. 2) in combination with a retractable spindle arm 908. As illustrated in Fig. 26A, attachment mechanism 900 is affixed to one end of a cable 920 which has a closed loop 922 at its other end. Cable 920 is first wrapped around a relatively immovable object (not shown) and attachment mechanism 900 is passed through loop 922 and attached to the item to be protected such as external wall 950 to make it difficult to steal.

Attachment mechanism 900 is shown in its retracted position in Fig. 26B and generally includes a housing 902 and first and second, resilient engagement arms 904L and 904R which are mounted to the bottom end of housing 902 and extend outwardly therefrom. Engagement arms 904L, 904R have first and second, inwardly angled engagement portions 906L and 906R at the distal end of each of the arms which are configured so as to be easily received within slot 952 in the retracted position

of spindle arm 908, as will be described in more detail hereinafter. At the other end of housing 902 from the engagement arms is a conventional cylindrical lock assembly 910, an example of which was described in detail by reference to Fig. 13B. A spindle arm 908 is adapted to be mounted to cylindrical lock assembly 910 at one end, with the opposite end of arm 908 extending between engagement arms 904L and 904R external of housing 902. Spindle arm 908 is connected to lock assembly 910 in such a manner that rotation of lock assembly 910 with an appropriate key (not shown) will cause translational movement of spindle arm 908 in the direction of arrow 930 (see Fig. 26B). This movement of arm 908 can be accomplished in any manner as is well known in the art, as for example having spindle arm 908 received within a corkscrew shaped cam attachment mounted to lock assembly 910 so that rotation of the lock will cause corresponding translational movement of spindle arm 908.

In operation, with spindle arm 908 in the retracted position of Fig. 27B, engagement portions 906L and 906R are insertable into slot 952. Once inside of slot 952, a key can be inserted into lock assembly 910 and rotated so that spindle arm 908 will be moved in the direction of arrow 930 to its extracted position. The movement of spindle arm 930 along arrow 930 permits engagement arms 904L and 904R to flex outwards in the direction of arrow 940 so that engagement portions 906L and 906R will move outwards to engage the inner surface of slot 952. In this way, attachment mechanism 900 will be secured proximate external wall 950. To subsequently detach attachment mechanism 900 from proximate external wall 950, the appropriate key is reinserted into lock assembly 910 and rotated to retract spindle arm 908. This will cause engagement arms 904L, 904R to relax back to their natural configuration of Fig. 27B to thereby permit engagement portions 906L, 906R to be separated from slot 952.

Fig. 29 is a perspective view of an alternate preferred embodiment of the present invention. There are occasions that cables and locks are inappropriate or a certain amount of mobility for protected equipment is necessary. In

those instances, using a proximity detecting system 980 can protect portable computer equipment. Proximity detecting system 980 includes a base unit 982 and a remote unit 984 relatively permanently attached to monitor 14 by use of a standardized slot 72 (as shown in Fig. 5 for example). The various embodiments shown in Figs. 1-28 provide examples of different attachment schemes for remote unit 984. Base unit 982 and remote unit 984 operate together to control a separation distance between them. There are many different ways to implement proximity detecting system 980 as well known in the art. One way provides base unit 982 with a transmitter for periodically transmitting a signal to remote unit 984.

In operation, remote unit 984 includes a receiver and a self-powered siren (not shown). Should remote unit 984 fail to receive the periodic transmission, the siren activates to indicate unauthorized removal of the protected equipment. Optionally, remote unit 984 includes a transmitter transmitting a unique ID code allowing base unit 982 to activate a siren and to identify a particular piece of protected equipment.

While several embodiments of the present invention have been illustrated by way of example, it is apparent that further embodiments could be developed within the spirit and scope of the present invention. However, it is to be expressly understood that such modifications and adaptations are within the spirit and scope of the present invention, as set forth in the following claims.

WHAT IS CLAIMED IS:

1. An apparatus for connecting to a portable device having an external wall provided with a specially designed generally rectangular slot having preselected dimensions, comprising:

a housing including a slot engagement member having a slot engaging portion provided with a locking member having a peripheral profile that fits within the preselected dimensions of the slot and thereby permits said locking member to extend into the slot, said slot engagement member being rotatable between an unlocked position wherein said locking member is removable from the slot, and a locked position wherein said locking member is retained within the slot; and

a pin, adapted to interlock said housing and to extend into the security slot proximate said slot engaging portion when said slot engagement member is in said locked position to thereby inhibit rotation of said slot engagement member to said unlocked position.

2. The apparatus of claim 1 wherein a first side of said housing abuts the external wall, said housing includes a cavity and a second side opposite said first side that is open to access said cavity wherein said pin is insertable through said second side and into said cavity to interlock said first side and the security slot.

3. The apparatus of claim 2 wherein said pin includes a threaded portion adapted to thread to a complementary threaded portion in an aperture in said first side of said housing.

4. The apparatus of claim 2 wherein said housing includes opposing sidewalls orthogonal to said first side wherein said opposing sidewalls include apertures to permit an object to extend therethrough after insertion of said pin into the security slot to inhibit removal of said pin from the security slot.

5. The apparatus of claim 2 further comprising a spindle adapted for insertion into said cavity, said spindle incorporating said pin at a first end such that insertion of said spindle into said cavity inserts said pin into the security slot through an aperture in said first side; and wherein said housing includes opposing sidewalls orthogonal to said first side wherein said opposing sidewalls include apertures and a second end of said spindle includes a transverse aperture colinear with said apertures in said opposing sidewalls, said apertures and said transverse apertures permitting an object to extend therethrough after insertion of said pin into the security slot to inhibit removal of said pin from the security slot.

6. An apparatus for connecting to a portable device having an external wall provided with a specially designed generally rectangular slot having preselected dimensions, comprising:

a housing;

a first and a second locking leg generally parallel to each other and adapted for movement between an unlocked position and a locked position, each locking leg secured within said housing and extending from said housing a distance greater than a thickness of the external wall, said first locking leg including a first locking flange at a distal end and said second locking leg including a second locking flange at a distal end wherein said locking flanges oppose each other and are adapted to engage an inner surface of the external wall through the security slot;

a key-actuated lock within said housing, said lock operable from a first postion to a second position; and

a locking member, coupled to said key-actuated lock and responsive to operation of said lock, for moving between a retracted position within said housing when said lock is in said first position to an extended position between said locking legs when said lock is in in said second position, said locking member moving said locking legs from said unlocked

position to said locked position when moving from said retracted position to said extended position.

7. An apparatus for connecting to a portable device having an external wall provided with a specially designed generally rectangular slot having preselected dimensions, comprising:

a housing;

a first and a second locking leg generally parallel to each other and adapted for movement between an unlocked position and a locked position, each locking leg secured within said housing and extending from said housing a distance greater than a thickness of the external wall, said first locking leg including a first locking flange at a distal end and said second locking leg including a second locking flange at a distal end wherein said locking flanges oppose each other and are adapted to engage an inner surface of the external wall through the security slot;

means, coupled to said housing and to said locking legs, for moving said legs from said unlocked position to said locked position while said locking flanges are disposed within the security slot.

8. An apparatus for connecting to a portable device having an external wall provided with a specially designed generally rectangular slot having preselected dimensions, comprising:

a housing;

a first and a second locking leg adapted for movement between an unlocked position and a locked position, each locking leg secured within said housing and extending from said housing a distance greater than a thickness of the external wall, said first locking leg including a first locking flange at a distal end and said second locking leg including a second locking flange at a distal end wherein said locking flanges oppose each other and are adapted to engage an inner surface of the external wall through the security slot; and

a locking member, coupled to a key-actuated lock and responsive to operation of said lock, for moving between a retracted position within said housing when said lock is in said first position to an extended position between said locking legs when said lock is in in said second position, said locking member moving said locking legs from said unlocked position to said locked position when moving from said retracted position to said extended position.

9. An apparatus for connecting to a portable device having an external wall provided with a specially designed generally rectangular slot having preselected dimensions wherein said external wall has an inner surface, comprising:

a slot engagement member having a first end provided with a locking member having a peripheral profile that fits within the preselected dimensions of the slot permitting said locking member to extend into the slot, said slot engagement member having a second end defining a first aperture that extends outside of the portable device when said first end extends within the slot, said engagement member being rotatable between an unlocked position wherein said locking member is removable from the slot, and a locked position wherein said locking member is retained within the slot; and

a housing adapted to be coupled to said slot engagement member when said slot engagement member is in said locked position, said housing including a pin that extends into the slot when said housing is coupled to said slot engagement member in said locked position and said housing further including a wall defining a second aperture, said second aperture coaxial with said first aperture when said pin extends into said slot.

10. The device connecting apparatus of claim 9 further comprising:

a locking object extending through said first and second apertures when they are aligned, said locking object inhibiting decoupling of said housing and said slot engagement member to

thereby inhibit removal of the apparatus from the device as long as said locking object extends through said apertures.

11. An apparatus for connecting to a portable device having an external wall provided with a specifically-designed generally rectangular security slot having preselected dimensions wherein said external wall has an inner surface, comprising:

a slot engagement member having a first portion and a second portion, said first portion including a slot engaging member adapted for insertion within the security slot when in a first position having said slot engaging member aligned with the security slot and adapted to engage an inner surface of the external wall to inhibit removal of the slot engaging member from the security slot when in a second position having said slot engagement member misaligned with the security slot, said second portion defining a first aperture wherein said second portion extends out of the security slot when said slot engagement member is in said second position;

a housing having a second aperture and a receptacle, said receptacle adapted for mating to said second portion of said slot engagement member wherein said first aperture and said second aperture are aligned when said housing is mated to said second portion and slot engagement member is in said second position, said housing including a pin that extends into the slot when said housing is mated to said slot engagement member and said apertures are aligned, wherein said pin inhibits said slot engagement from returning to said first position and thereby inhibits removal of said slot engagement member from the security slot.

12. The apparatus of claim 11 wherein said first portion is "T-shaped" having peripheral dimensions generally conforming to peripheral dimensions of the security slot.

13. The apparatus of claim 11 wherein said apertures of said housing and said slot engagement member are adapted to receive an object passing therethrough to maintain alignment of

said apertures and to thereby maintain said pin within the slot.

14. The apparatus of claim 13 wherein said object is a cable for attaching to a second object other than the portable device.

15. The apparatus of claim 11 wherein said pin extends a distance into the security slot that is greater than a wall thickness of the external wall.

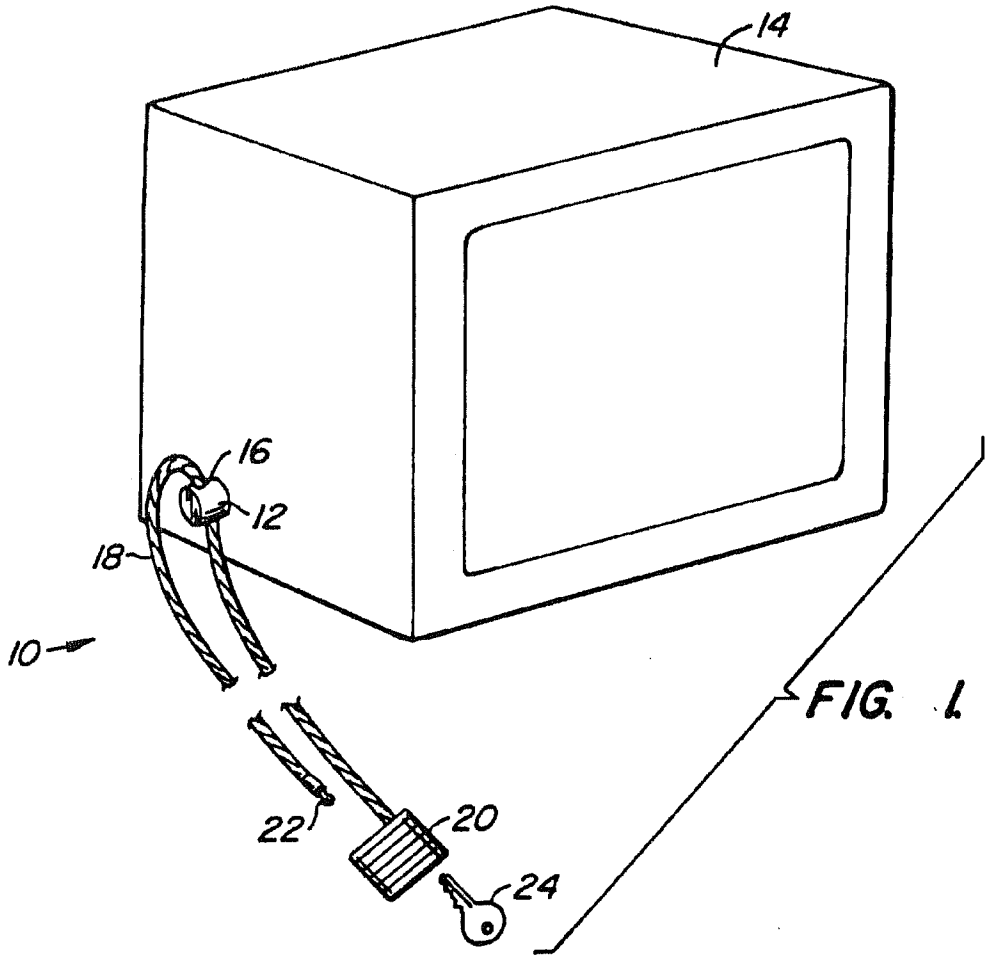


FIG. 1.

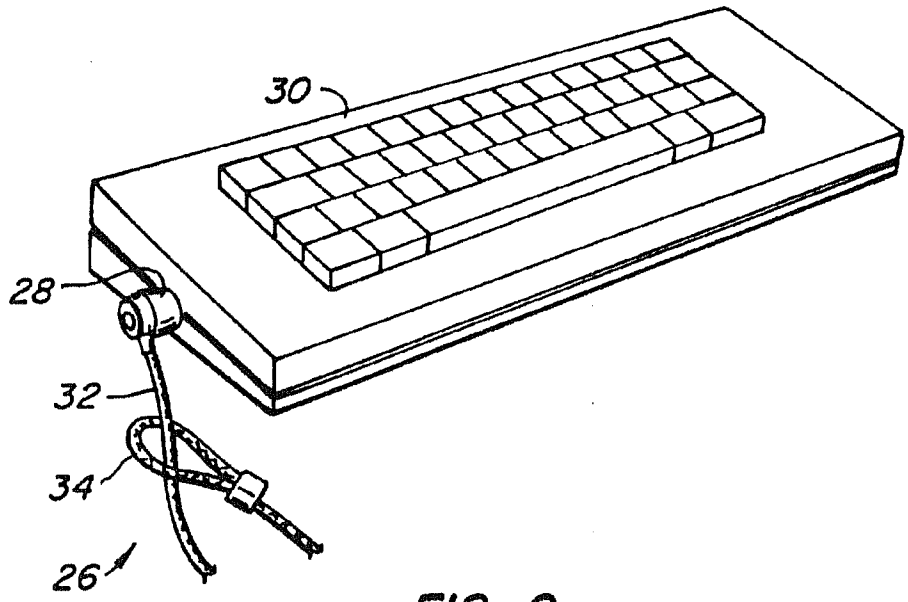


FIG. 2.

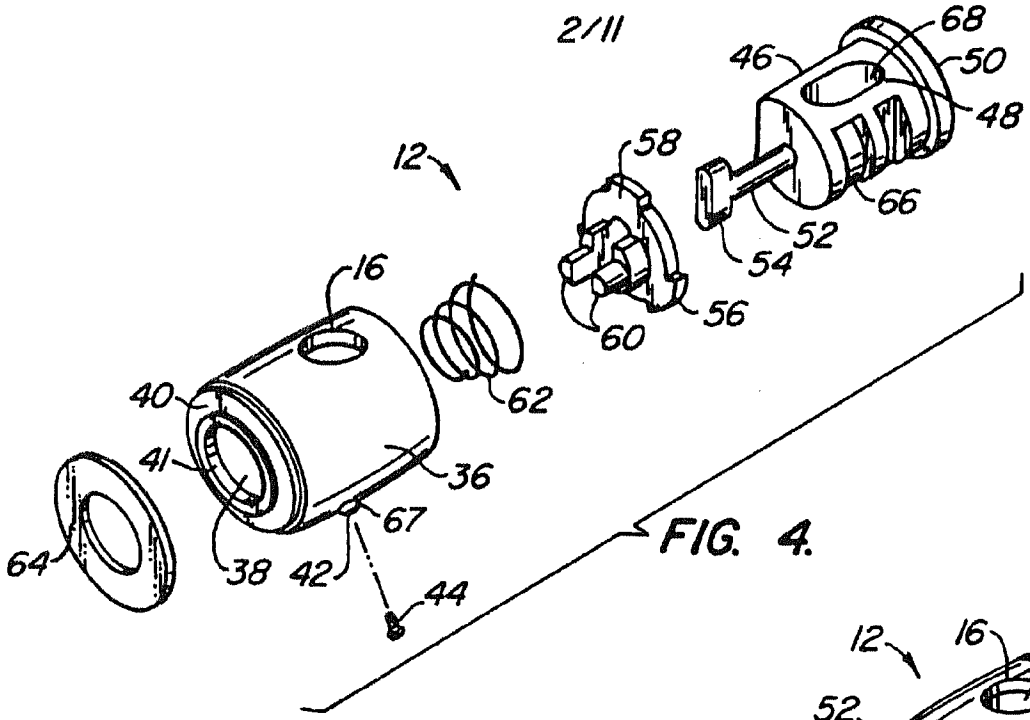


FIG. 4.

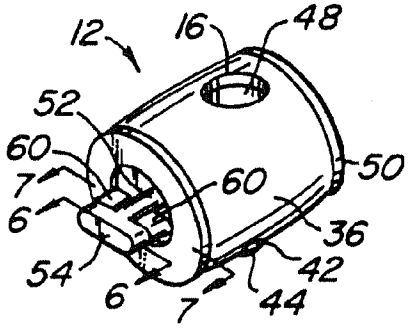


FIG. 3.

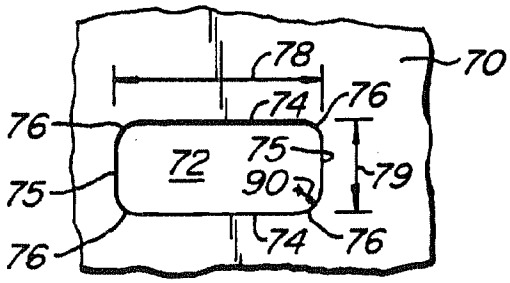


FIG. 5.

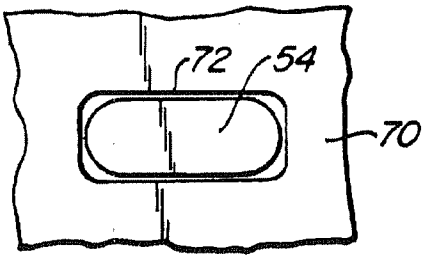


FIG. 8.

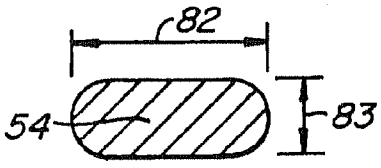


FIG. 6.

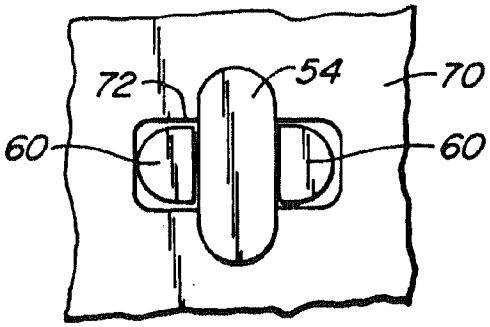


FIG. 9.

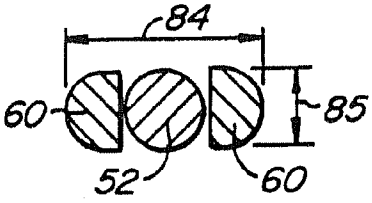


FIG. 7.

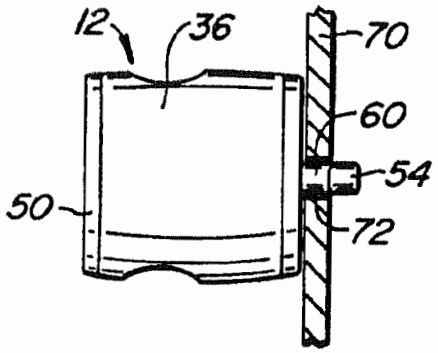


FIG. 10A.

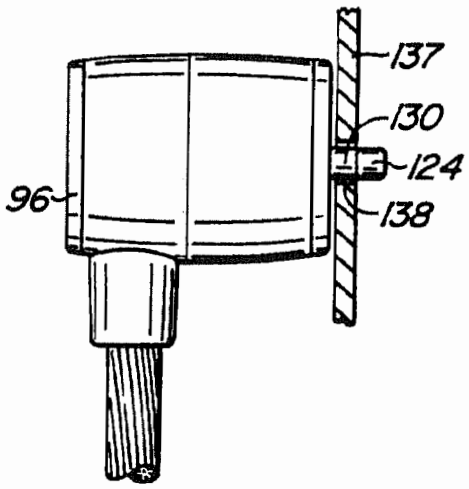


FIG. 13A.

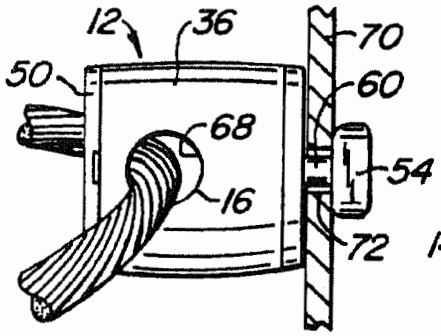


FIG. 10B.

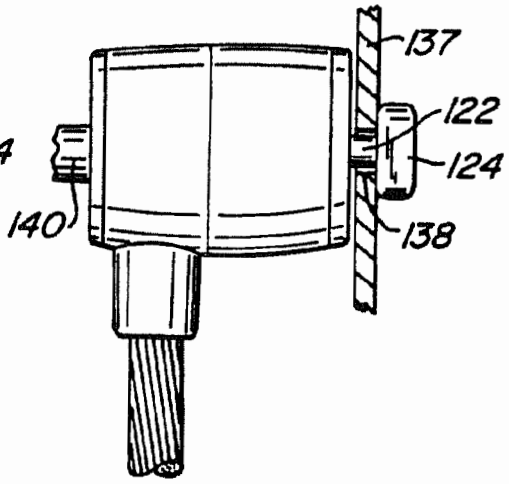


FIG. 13B.

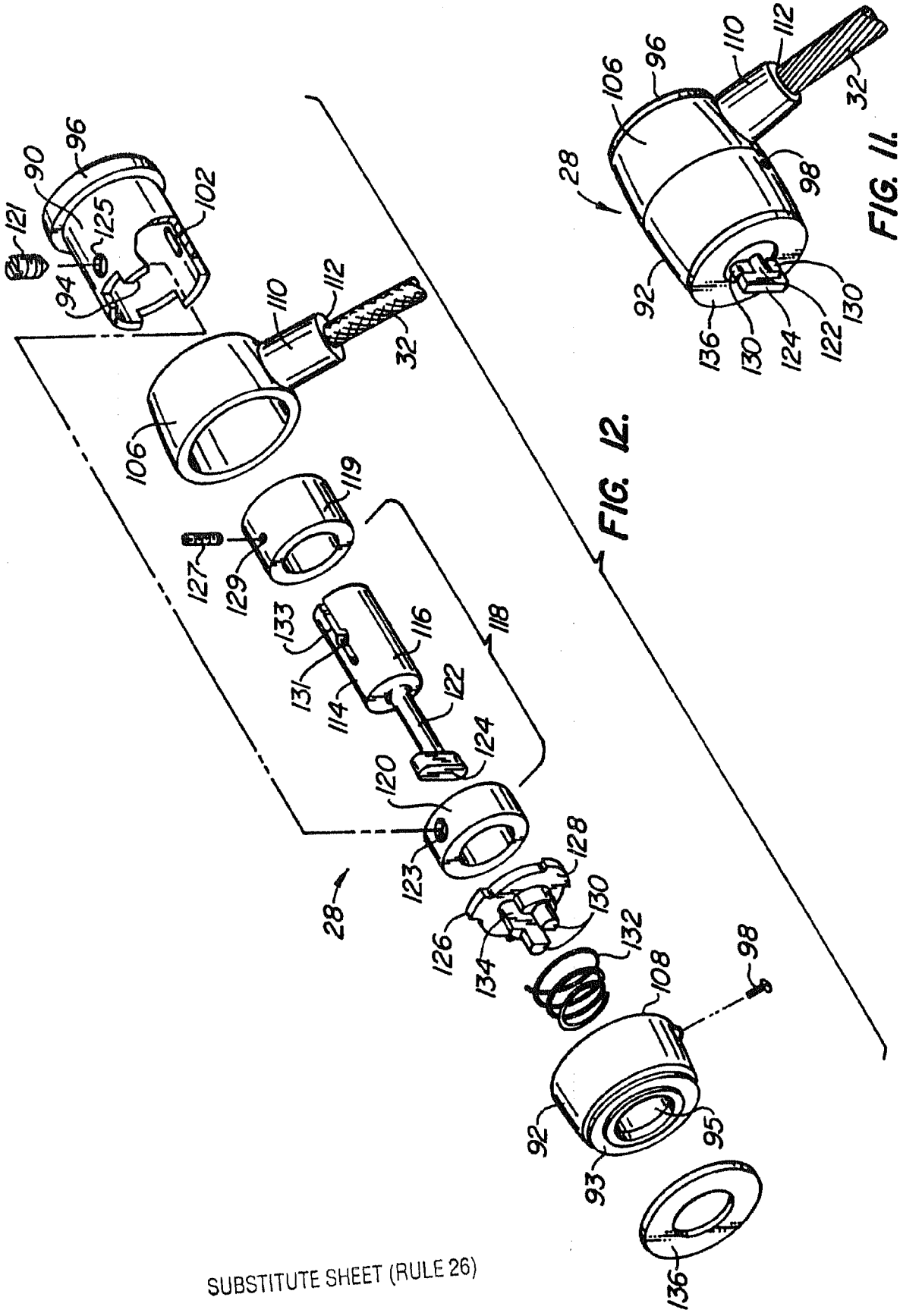


FIG. 12.

FIG. 11.

Ex. 1002 - Page 639 of 997

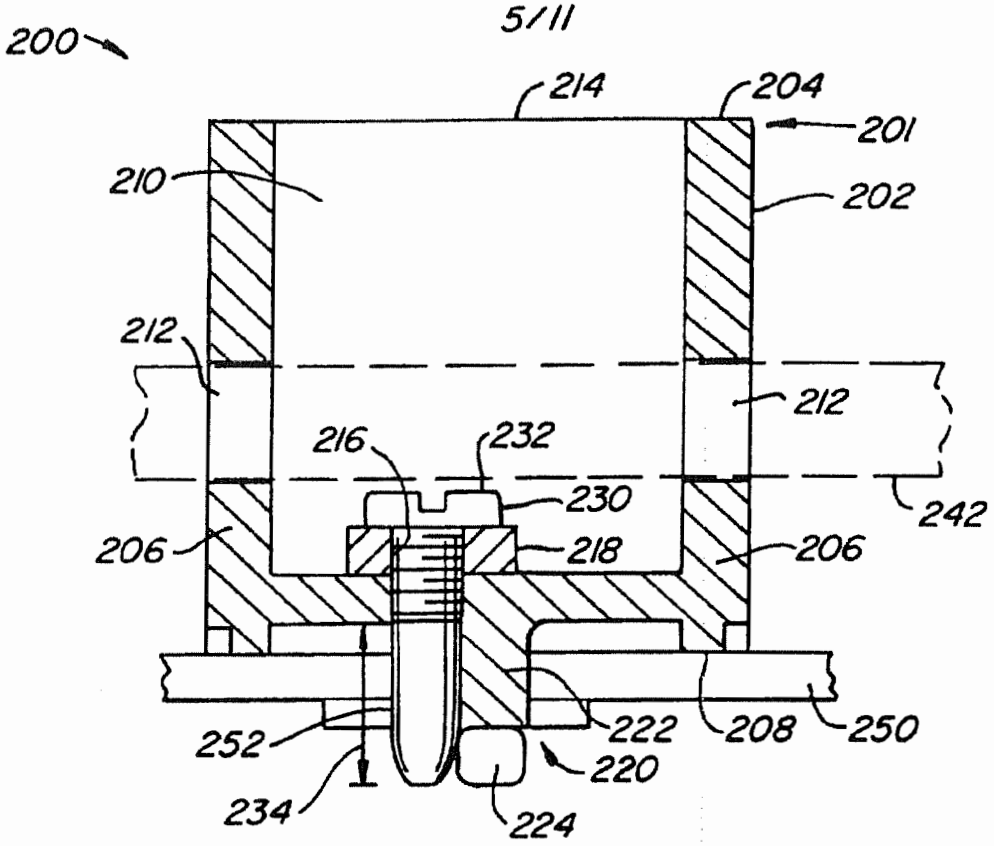

200
214
204
201
210
202
212
212
216
232
230
242
206
218
206
252
222
208
250
220
234
224

FIG. 14.

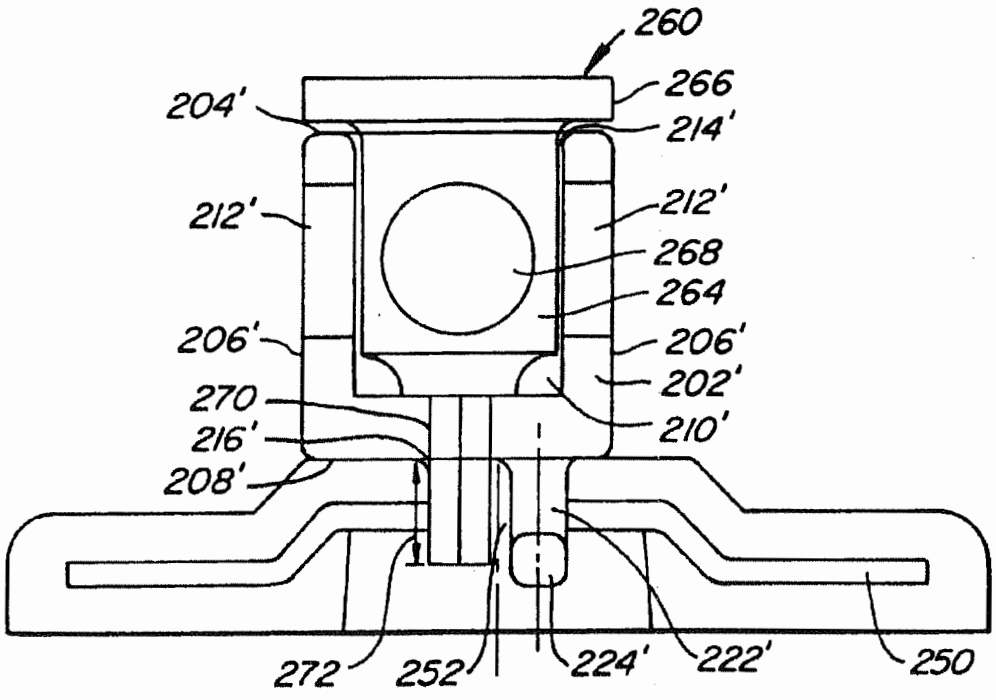

260
266
204'
214'
212'
212'
268
264
206'
206'
202'
270
210'
216'
208'
272
252
224'
222'
250

FIG. 15.

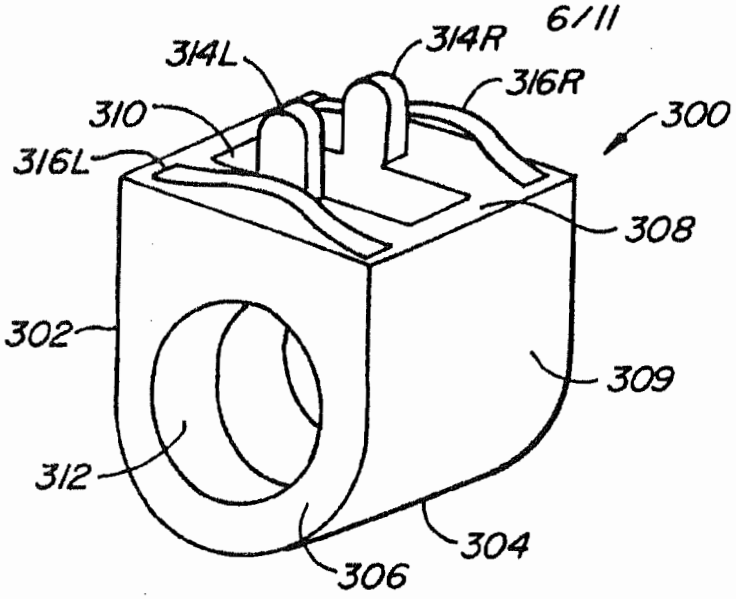


FIG. 16A.

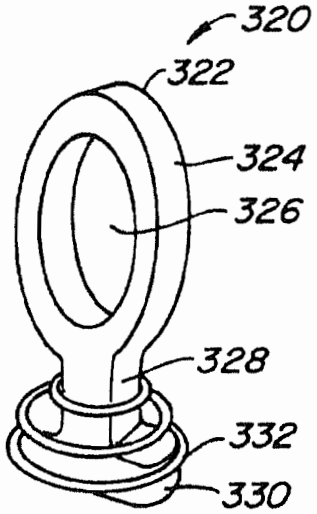


FIG. 16B.

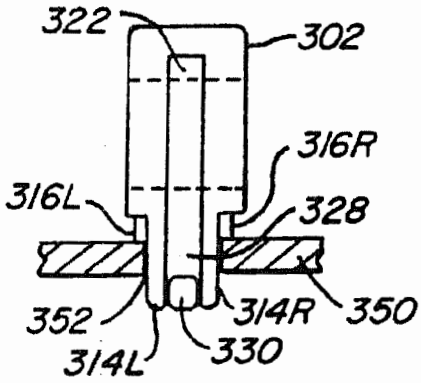


FIG. 16C.

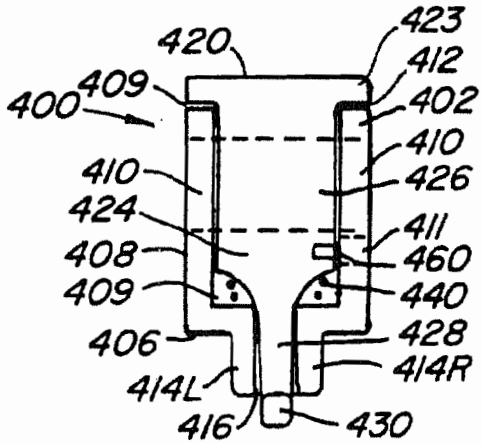


FIG. 17A.

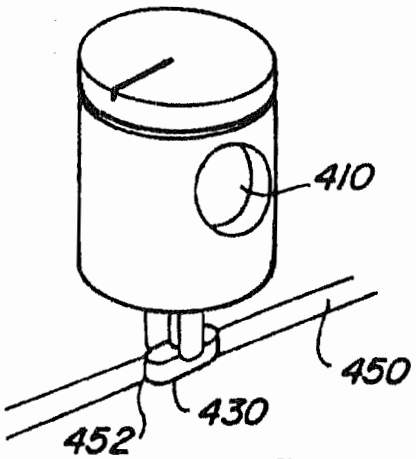


FIG. 17B.

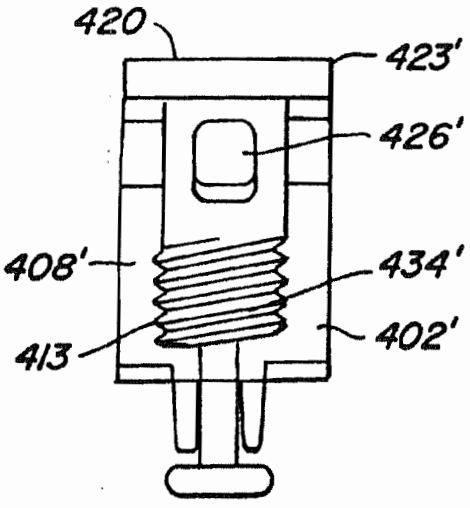


FIG. 18.

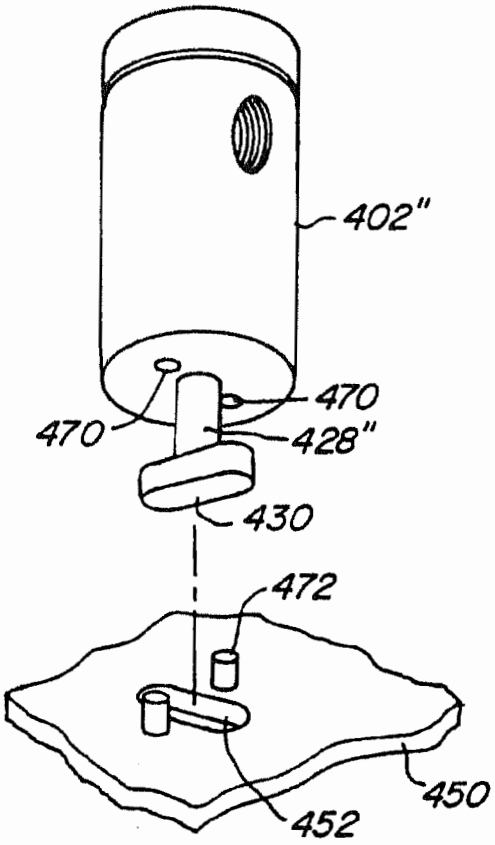


FIG. 19.

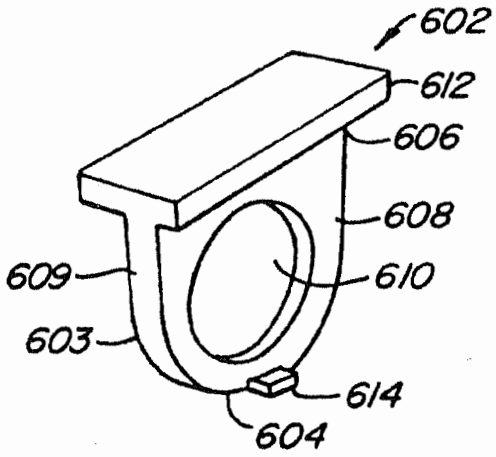


FIG. 20A.

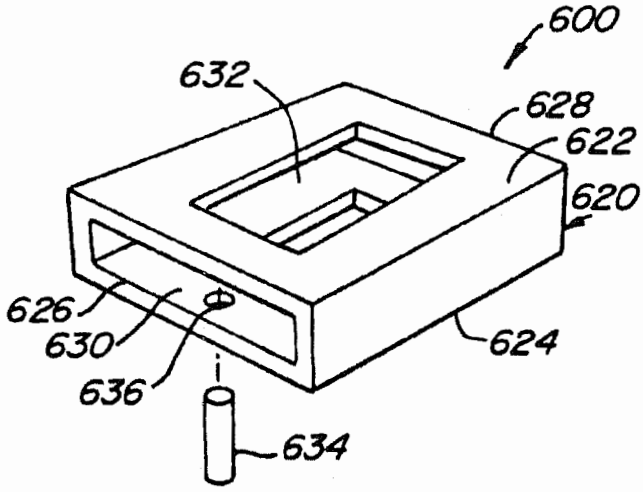


FIG. 20B.

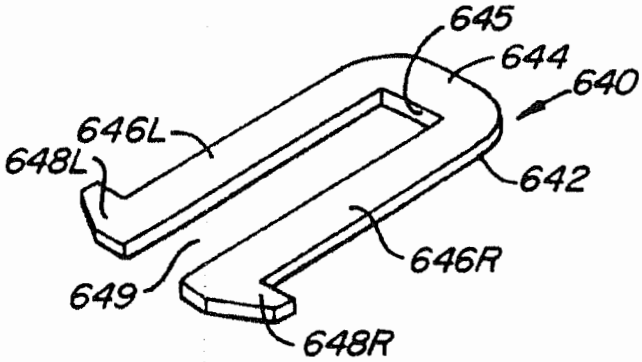


FIG. 20C.

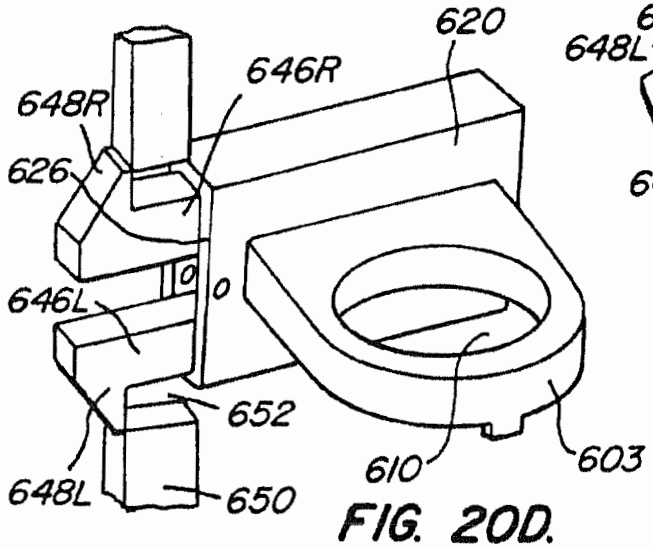


FIG. 20D.

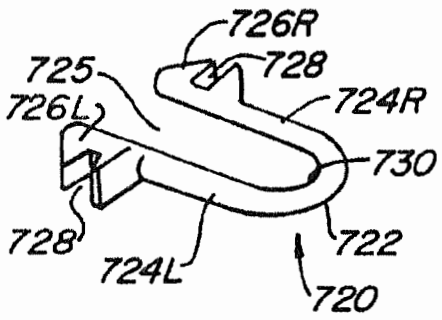


FIG. 21A.

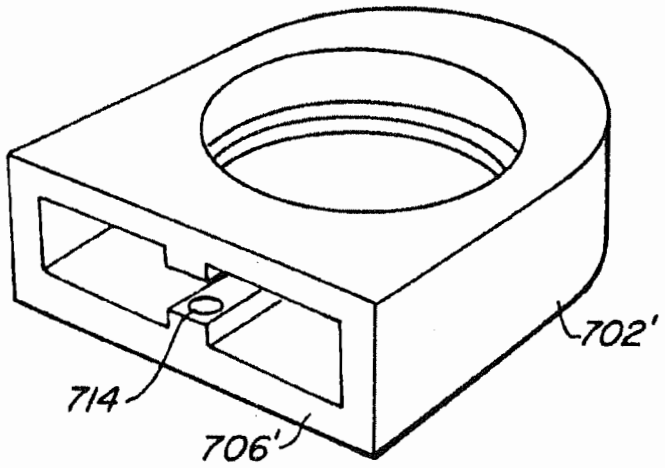


FIG. 22B.

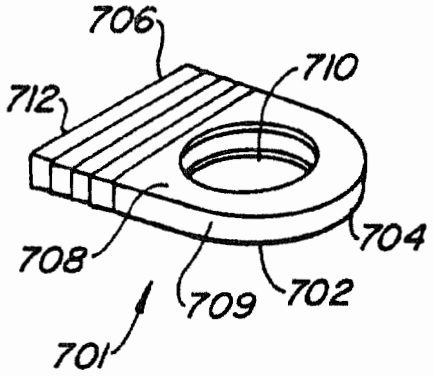


FIG. 21B.

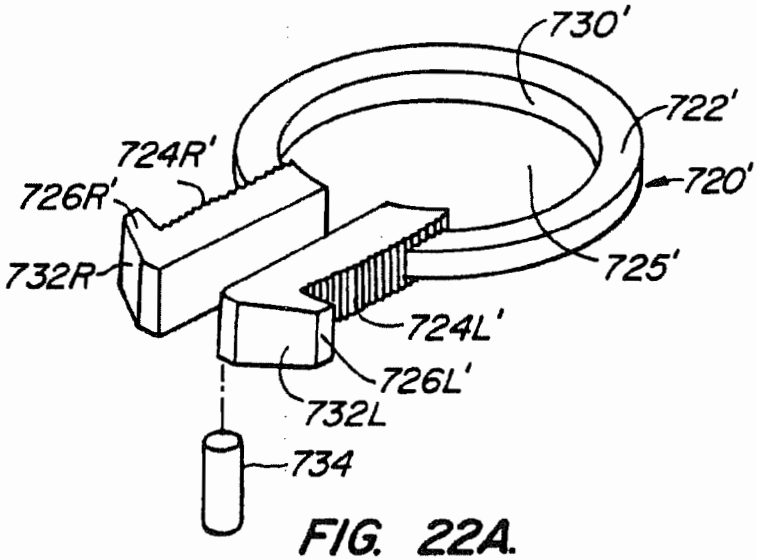


FIG. 22A.

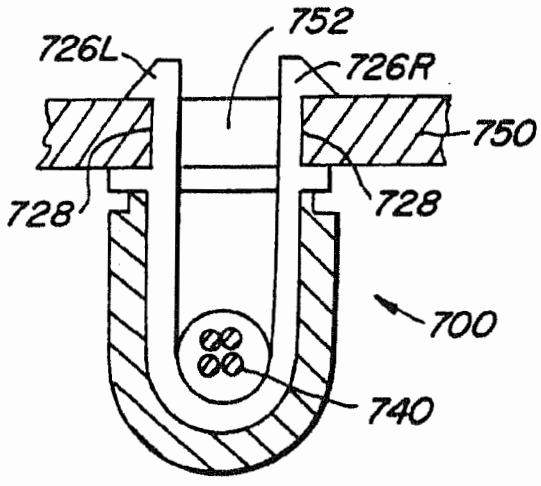


FIG. 21C.

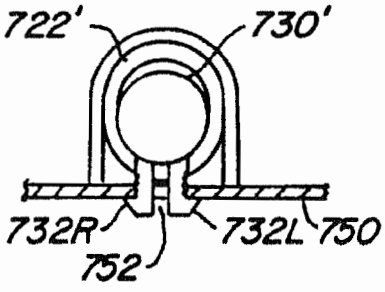


FIG. 22C.

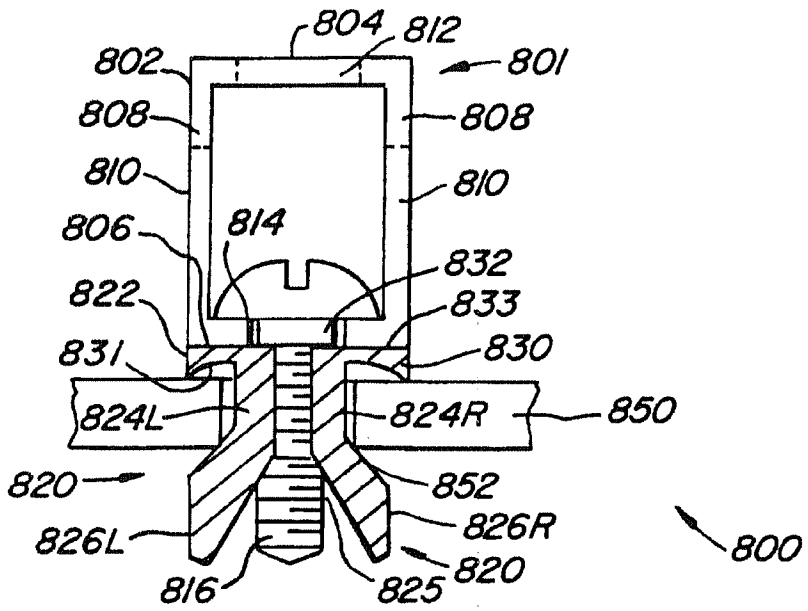


FIG. 23A.

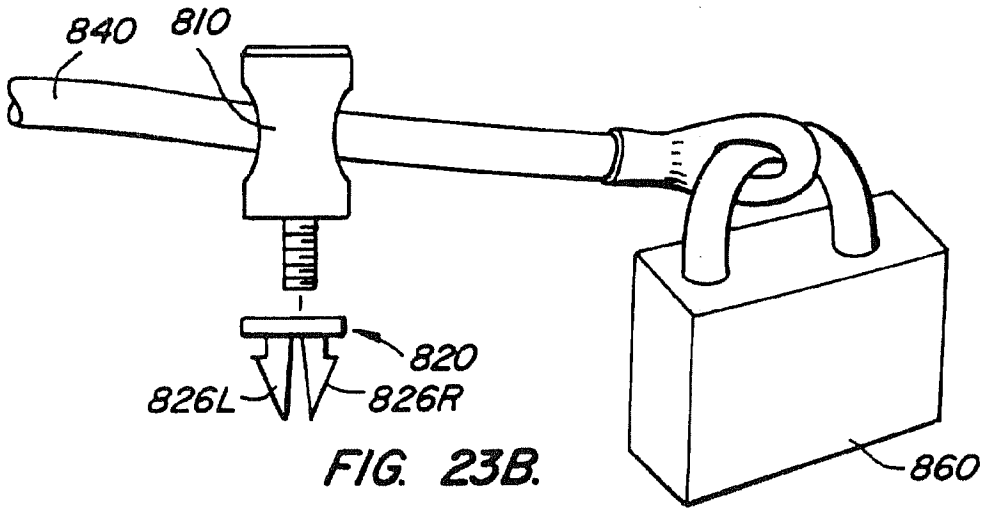


FIG. 23B.

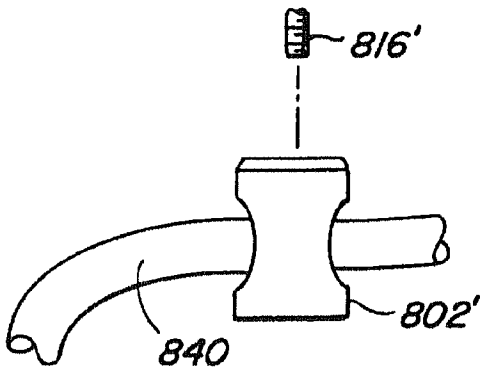


FIG. 24A.

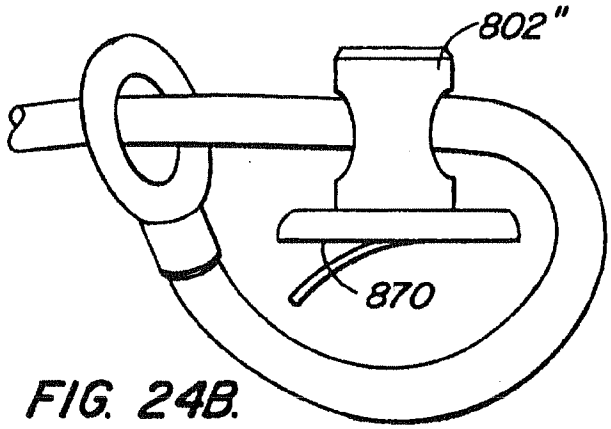


FIG. 24B.

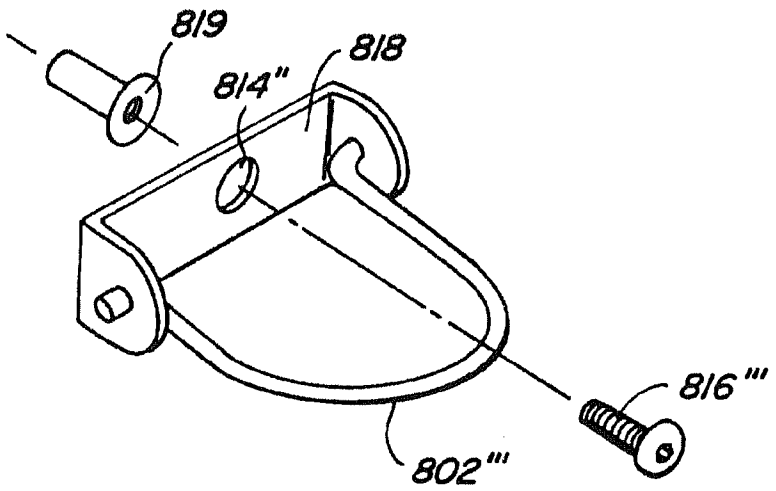


FIG. 25.

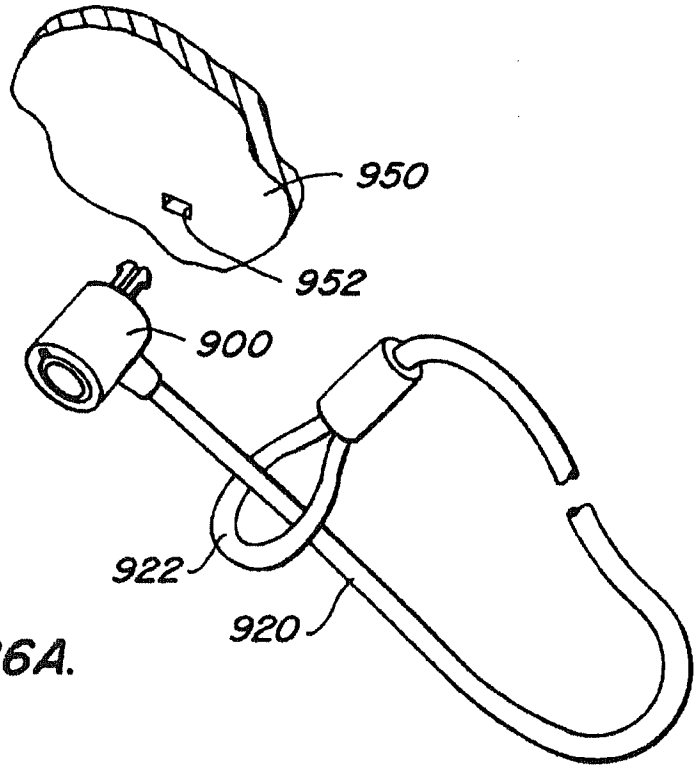


FIG. 26A.

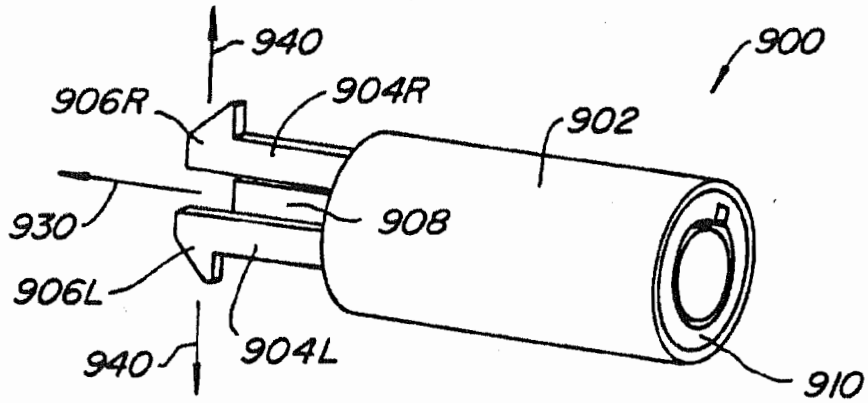


FIG. 26B.

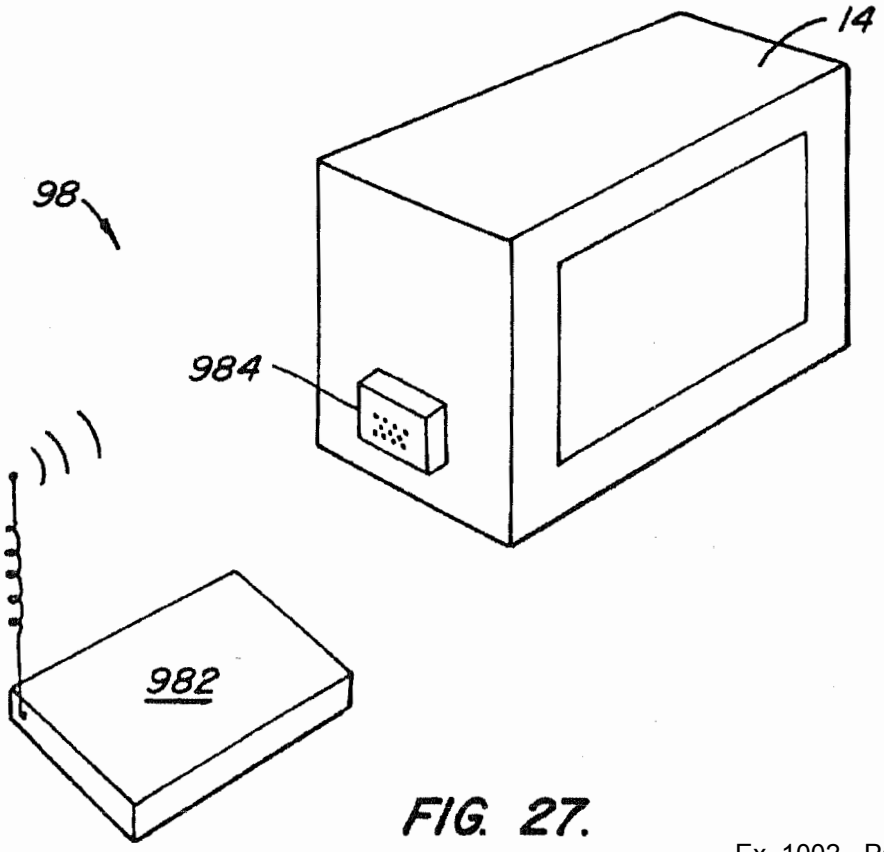


FIG. 27.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/13212

A. CLASSIFICATION OF SUBJECT MATTER
IPC(6) :E05B 69/00
US CL :70/58, 14, 57; 248/553
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 70/58, 14, 57, 423-430, 18, 232; 248/553, 551, 505; 411/552,553,555,549,349,343,216,217

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US, A, 2,677,261 (JACOBI) 04 May 1954, whole document	1,2 --- 4,5
X	US, A, 786,842 (ROBESON) 11 April 1905, whole document.	1-3
X	US, A, 611,646 (PARKER) 04 October 1898, whole document.	1-3
X --- Y	US, A, 881,364 (WHEELER) 10 March 1908, whole document.	9-11, 13, 15 --- 4,5
Y	US, A, 5,082,232 (WILSON) 21 January 1992, whole document.	9-15

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search	Date of mailing of the international search report
04 FEBRUARY 1995	13 FEB 1995

Name and mailing address of the ISA/US	Authorized officer
Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	DARNELL BOUCHER
Facsimile No. (703) 305-3230	Telephone No. (703) 308-2168

Form PCT/ISA/210 (second sheet)(July 1992)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/13212

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 4,801,232 (HEMPEL) 31 January 1989, whole document.	9-15
X	US, A, 505,299 (SCHNEIDER) 19 September 1893, whole document.	6-8
X	US, A, 4,704,881 (SLOOP, SR.) 10 November 1987, whole document.	9-11, 13, 15
A	US, A, 3,171,182 (DANEHY) 02 March 1965, whole document.	9-15

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
2 May 2008 (02.05.2008)

PCT

(10) International Publication Number
WO 2008/051919 A2

(51) International Patent Classification:
E05B 67/06 (2006.01)

(21) International Application Number:
PCT/US2007/082113

(22) International Filing Date: 22 October 2007 (22.10.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/853,888	23 October 2006 (23.10.2006)	US
60/909,867	3 April 2007 (03.04.2007)	US
60/940,318	25 May 2007 (25.05.2007)	US

(71) Applicant *(for all designated States except US)*: **ACCO BRANDS USA LLC** [US/US]; 300 Tower Parkway, Lincolnshire, Illinois 60069 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **HUNG, John** [CA/CA]; 2744 Byron Road, North Vancouver, British Columbia V7H 1M2 (CA). **WHITE, Ryan** [US/US]; 709 Clayton Street, Apt. 3, San Francisco, California 94117 (US). **ANDRES, Guillermo** [US/US]; 3440 Gavina Place, Pleasanton, California 94566 (US). **DOBSON, David Thomas** [CA/CA]; 5686 Timbervalley Road, Delta, British Columbia V4L 2E6 (CA). **GAGNE, Jacque** [CA/US]; 101 Shire Court, Los Gatos, California 95030 (US).

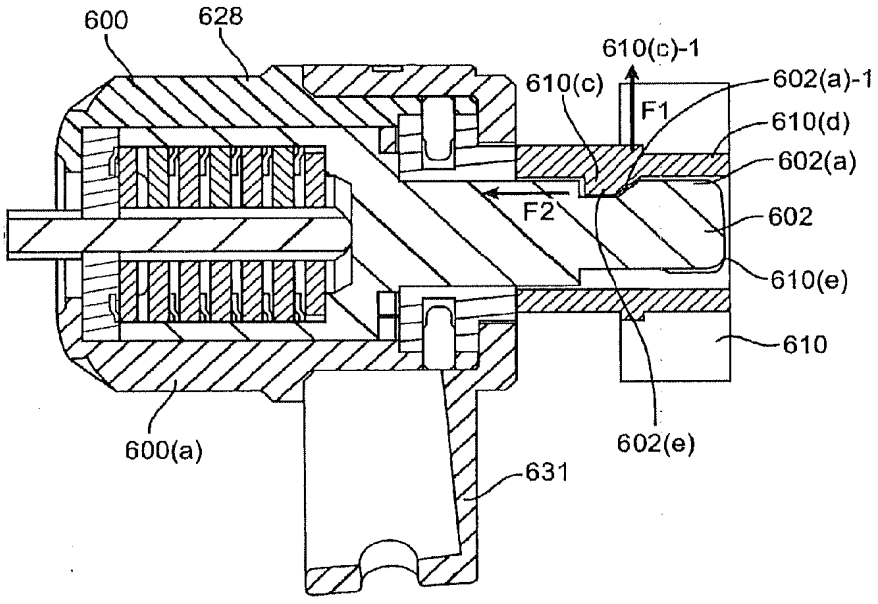
(74) Agents: **JEWIK, Patrick R.** et al.; Townsend and Townsend and Crew LLP, Two Embarcadero Center, 8th Floor, San Francisco, California 94111 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: SECURITY APPARATUS



(57) Abstract: A security apparatus is disclosed. The security apparatus is used with a lock interface member attached to a housing of a portable electronic device. The security apparatus may include an engagement element as well as a stabilizing element. The engagement element and the stabilizing element may secure the security apparatus to the lock interface member, and therefore to the housing of the portable electronic device.

WO 2008/051919 A2

European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report*

SECURITY APPARATUS

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application is a non-provisional of and claims the benefit of the filing dates of the following U.S. provisional patent applications: 60/853,888, filed on October 23, 2006; 60/909,867, filed on April 3, 2007, and 60/940,318, filed on May 25, 2007, which are herein incorporated by reference in their entirety for all purposes.

BACKGROUND

[0002] Embodiments of the present invention relate to devices for inhibiting the theft of relatively small but expensive pieces of equipment.

[0003] Computers have evolved rather rapidly from large, expensive machines usable only by a few, to relatively small, portable machines which are usable by many. In particular, the development of personal computers with significant processing power has made computers available to the general population. It is now common for college and even high school students to have their own computer, and personal computers are in wide spread use as word processors and work stations in almost all forms of business. Personal computers are relatively small and easily transportable, and an undesirable side effect of their proliferation is the fact that the theft of such computers is a significant problem.

[0004] A variety of devices have been developed to inhibit the theft of personal computers and similar equipment. Since personal computer systems involve several components, typically including the computer itself, a separate monitor, keyboard and often a printer, such security systems often employ a cable which attaches each of the components to each other and to a relatively immovable object such as a desk. The principal difficulty in such systems is providing an effective and convenient method for attaching the cable itself to the equipment.

[0005] One way to address the problem of computer security is to provide a small, generally rectangular slot in a wall of a computer. A security apparatus with a locking head may be secured to the computer via the rectangular slot.

[0006] While the conventional rectangular slot solution is effective, improvements could be made. For example, although thieves are deterred from stealing portable computers secured by conventional security mechanisms, in some cases, such thieves may be more interested in the data stored in the computers rather than the computers themselves. Accordingly, the damage that may occur to a computer that may occur during the theft of the computer may not deter a thief who wants the data stored inside of the computer. It would be desirable to improve the strength of the physical coupling between the security apparatus and the computer and so that it is more difficult for potential thieves to separate the security apparatus from the computer.

[0007] Embodiments of the invention address these and other problems, individually and collectively.

BRIEF SUMMARY

[0008] Embodiments of the invention are directed to security apparatuses, systems, and methods for using such security apparatuses. Other embodiments of the invention may be directed to lock interface members and systems and methods incorporating such lock interface members.

[0009] One embodiment of the invention is directed to a system including a portable electronic device comprising a lock interface member having an aperture and a protrusion, and a security apparatus. The security apparatus comprises a head comprising an engagement element adapted to engage the lock interface member via the aperture and the protrusion, and is preferably cooperatively structured with the protrusion. The head also comprises a stabilizing element capable of preventing the engagement element from being separated from the lock interface member when the engagement element is in a locked configuration.

[0010] Another embodiment of the invention is directed to a method for securing a security apparatus. The security apparatus is used with a lock interface member having an aperture and a protrusion. The security apparatus comprises a head comprising an engagement element adapted to engage the lock interface member via the aperture and the protrusion. The head also comprises a stabilizing element capable of being inserted into the lock interface member to prevent the engagement element from being removed from the aperture, and a security device attached to the head. The method includes: (a) inserting the engagement element into the aperture, (b) moving the engagement element so that the

engagement element is secured to the lock interface member, and wherein at least a portion of the engagement element engages the protrusion, and (c) inserting the stabilizing element into the lock interface member.

[0011] Another embodiment of the invention is directed to a security apparatus for use with a lock interface member having an aperture and a protrusion. The security apparatus includes a head comprising an engagement element adapted to engage the lock interface member via the aperture and the protrusion. The engagement element is configured to engage the lock interface member. The head also includes a stabilizing element that is capable of being inserted into the lock interface member to prevent the engagement element from being removed from the aperture. A security device may be attached to the head.

[0012] These and other embodiments of the invention are described in further detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1 shows a perspective view of a portable electronic device and a security apparatus.

[0014] FIG. 2(a) shows a front, perspective view of a portion of a security apparatus according to another embodiment of the invention.

[0015] FIG. 2(b) shows a rear perspective view of the security apparatus portion shown in FIG. 2(a), along with a perspective view of a lock interface member in a portable electronic device.

[0016] FIG. 2(c) is an exploded view of the security apparatus shown in FIGS. 2(a)-2(b).

[0017] FIG. 2(d) shows a perspective view of a portion of the security apparatus shown in FIGS. 2(a) and 2(b) when it is configured in a locked position in a lock interface member in a portable electronic device. A portion of the portable electronic device is cut away for clarity of illustration.

[0018] FIG. 2(e) shows a side, cross-sectional view of the portion of the security apparatus and portable electronic device shown in FIG. 2(c).

[0019] FIG. 2(f) shows a top, cross-sectional view of the portion of the security apparatus and the portable electronic device shown in FIG. 2(c).

[0020] FIG. 2(g) shows a side view of a head of the type shown in FIG. 2(a).

[0021] FIG. 2(h) shows a perspective view of the head shown in FIG. 2(g).

[0022] FIG. 2(i) shows a rear view of the head shown in FIG. 2(h).

[0023] FIG. 2(j) shows a side view of the head shown in FIG. 2(i).

[0024] FIG. 2(k) shows a front view of the head shown in FIG. 2(i).

[0025] FIG. 3(a) shows a front view of a portion of a security apparatus according to another embodiment of the invention, as it is about to be secured to a portable electronic device via a lock interface member.

[0026] FIG. 3(b) shows a perspective view of the portion of the security apparatus shown in FIG. 3(a) as it is inserted into the lock interface member. A portion of the lock interface member and the portable electronic device are cut away for clarity of illustration.

[0027] FIG. 3(c) shows a perspective view of the portion of the security apparatus shown in FIG. 3(a), as a portion of the head in the security apparatus is inserted into the lock interface member, and is rotated to engage engagement elements in the head to inner protrusions and slots in the lock interface member.

[0028] FIG. 3(d) shows a horizontal cross-sectional view of a lock interface member.

[0029] FIG. 3(e) shows a horizontal, cross-sectional view of the portion of the security apparatus shown in FIG. 3(a).

[0030] FIG. 3(f) shows a side, cross-sectional view of the head of the security apparatus shown in FIG. 3(c), before a stabilizing element is inserted into the lock interface member.

[0031] FIG. 3(g) shows a side, cross-sectional view of the head of the security apparatus shown in FIG. 3(c), after a stabilizing element is inserted into the lock interface member.

[0032] FIG. 3(h) shows a perspective view of the security apparatus shown in FIG. 3(c), after a stabilizing element is inserted into the lock interface member. A portion of the

lock interface member and the portable electronic device are cut away for clarity of illustration.

[0033] FIG. 3(i) is a front view of a lock interface member.

[0034] FIG. 3(j) shows a side cross-sectional view of the lock interface member shown in FIG. 3(i).

[0035] FIG. 3(k) is a perspective view the lock interface member shown in FIG. 3(i).

[0036] FIG. 3(l) is a top view of the lock interface member shown in FIG. 3(i).

[0037] FIGS. 3(m) and 3(n) are perspective views of other lock interface members according to other embodiments of the invention.

[0038] FIGS. 4(a)-4(c) show perspective views of another security apparatus and lock interface member according to an embodiment of the invention.

[0039] FIG. 4(d) shows a side-cross-sectional view of the security apparatus in FIGS. 4(a)-4(c) when it is engaged with the lock interface member.

[0040] FIGS. 5(a)-5(c) shows perspective, front, and side views of a locking head.

[0041] FIGS. 6(a)-6(b) show front views of lock interface members.

[0042] FIGS. 7(a)-7(c) show cross-sectional views of a lock interface member.

[0043] FIG. 8 shows an exploded view of a lock head and a lock interface member according to one embodiment of the invention.

[0044] FIGS. 9(a)-9(b) respectively show perspective views of a locking head embodiment in unlocked and locked configurations.

[0045] FIG. 9(c) shows a side view of the locking head embodiment shown in FIGS. 9(a)-9(b) when it is engaged with a lock interface member.

[0046] FIG. 9(d) shows a top view of the locking head embodiment shown in FIG. 9(a)-9(b) when it is engaged with a lock interface member.

[0047] FIGS. 10(a)-10(b) respectively show perspective views of another locking head embodiment in unlocked and locked configurations.

[0048] FIG. 10(c) shows an outward view of the locking head embodiment shown in FIG. 10(c), when it is engaged with a lock interface member.

[0049] FIGS. 11(a)-11(b) respectively show perspective views of another locking head embodiment in unlocked and locked configurations.

[0050] FIG. 11(c) shows an outward view of the locking head embodiment shown in FIG. 11(c), when it is engaged with a lock interface member.

[0051] FIG. 12(a) shows a perspective view of another locking head embodiment, in an unlocked configuration.

[0052] FIG. 12(b) shows an outward view of the locking head embodiment shown in FIG. 12(a) when it is engaged with a lock interface member.

[0053] FIG. 12(c) shows a top view of a portion of the locking head shown in FIG. 12(a).

[0054] FIGS. 13(a) and 13(b) respectively show a perspective view and side view of another locking head embodiment in a locked configuration.

[0055] FIG. 13(c) shows a perspective view of the locking head embodiment in an unlocked configuration.

[0056] FIGS. 14(a)-14(b) respectively show perspective views of another locking head embodiment in unlocked and locked configurations.

[0057] FIGS. 14(c) shows a perspective view of the locking head shown in FIGS. 14(a)-14(b) in a partially exploded view.

[0058] FIGS. 14(d)-14(e) respectively show side views of another locking head embodiment in unlocked and locked configurations.

[0059] FIGS. 15(a)-15(b) respectively show perspective views of another locking head embodiment in unlocked and locked configurations.

[0060] FIG. 15(c) shows an outward view of the locking head embodiment shown in FIGS. 15(a)-15(b), when it is engaged with a lock interface member.

[0061] FIG. 16 shows perspective views of another security apparatus embodiment in disassembled and assembled states.

[0062] FIGS. 17(a)-17(b) respectively show perspective views of another locking head embodiment in unlocked and locked configurations.

[0063] FIG. 17(c) shows an outward view of the locking head embodiment shown in FIGS. 17(a)-17(b), when it is engaged with a lock interface member.

[0064] FIGS. 18(a)-18(b) respectively show perspective views of another locking head embodiment in unlocked and locked configurations.

[0065] FIG. 18(c) shows an outward view of the locking head embodiment shown in FIGS. 18(a)-18(b), when it is engaged with a lock interface member.

[0066] FIGS. 19(a)-19(b) respectively show perspective views of another locking head embodiment in unlocked and locked configurations.

[0067] FIGS. 19(c)-19(d) respectively show outward views of the locking head embodiment shown in FIGS. 19(a)-19(b), when they are in unlocked and locked configurations when associated with a lock interface member.

[0068] FIG. 20(a) shows a perspective view of another locking head embodiment.

[0069] FIGS. 20(b) and 20(c) respectively show embodiments where the locking head is not secured to a lock interface member and where the locking head is secured to the lock interface member.

[0070] FIGS. 21(a) and 21(b) respectively show a locking head with a stabilizing element in a retracted position and an extended position.

[0071] FIG. 21(c) shows a locking head with an engagement element not engaged with a lock interface member.

[0072] FIG. 21(d) shows a locking head with an engagement element that is engaged with a lock interface member.

[0073] FIG. 22(a) shows a locking head embodiment with an engagement element in a retracted position.

[0074] FIG. 22(b) shows a locking head embodiment with an engagement element in an extended position.

[0075] FIG. 22(c) shows a locking head that is secured to a lock interface member.

[0076] FIGS. 23(a) and 23(b) show a locking head embodiment in an unlocked configuration and a locked configuration.

[0077] FIG. 23(c) shows a side, cross-sectional view of the locking head embodiment shown in FIG. 23(a).

[0078] FIGS. 24(a) and 24(b) respectively show side cross-sectional views of locking head embodiments that are in unlocked and locked configurations.

[0079] FIG. 24(c) shows a perspective view of a locking head embodiment in a locked configuration.

[0080] FIG. 25(a) shows a perspective view of a locking head embodiment in a locked configuration.

[0081] FIG. 25(b) shows a side, cross-sectional view of the locking head embodiment in FIG. 25(a) in an unlocked configuration.

[0082] FIG. 25(c) shows a side, cross-sectional view of the locking head embodiment in FIG. 25(a) in a locked configuration.

[0083] FIGS. 26(a) and 26(b) show side views of a locking head embodiment in a locked configuration and an unlocked configuration when present in a lock interface member.

[0084] FIG. 26(c) shows a perspective view of another locking head embodiment.

[0085] FIGS. 27(a) and 27(b) show perspective views of a locking head embodiment in an unlocked and a locked configuration.

[0086] FIG. 27(c) shows a locking head embodiment when the locking head is secured to a lock interface member.

[0087] FIG. 28(a) shows a side, cross-sectional view of another locking head embodiment in an unlocked configuration.

[0088] FIG. 28(b) shows an axial view of the locking head embodiment shown in FIG. 28(a).

[0089] FIG. 28(c) shows a perspective view of a locking head embodiment in a locked configuration.

[0090] FIG. 29(a) shows a perspective view of another locking head embodiment in a locked configuration.

[0091] FIG. 29(b) shows an axial view of the locking head embodiment shown in FIG. 29(a).

[0092] FIG. 29(c) shows a side, cross-sectional view of a locking head embodiment in a locked configuration.

[0093] FIGS. 30(a)-30(b) respectively show locking head embodiments in locked and unlocked configurations.

[0094] FIGS. 31(a)-31(b) respectively show locking head embodiments in locked and unlocked configurations.

[0095] FIG. 32(a) shows another locking head embodiment.

[0096] FIGS. 32(b)-32(c) show side views of other locking head embodiments.

[0097] FIGS. 33(a)-33(b) respectively show locking head embodiments in unlocked and locked configurations.

[0098] FIG. 33(c) shows a locking head embodiment secured to a lock interface member.

[0099] FIG. 34(a) shows a perspective view of another locking head embodiment.

[0100] FIGS. 34(b)-34(c) show side, cross-sectional views of another locking head embodiment in an unlocked and locked configuration.

[0101] FIGS. 35(a)-35(b) show a perspective view of another locking head embodiment in an unlocked and a locked configuration.

[0102] FIGS. 35(c)-35(d) respectively show how pushing a button on a lock body and how rotating a barrel on a lock body can be used to rotate engagement element portions.

[0103] FIGS. 36(a)-36(b) show perspective views of another locking head embodiment in an unlocked and a locked configuration.

[0104] FIG. 36(c) shows the locking head embodiment shown in FIG. 36(a) when it is secured to a lock interface member.

[0105] FIGS. 37(a)-37(b) show perspective views of another locking head embodiment in an unlocked and a locked configuration.

[0106] FIGS. 37(c)-37(d) respectively show side views of locking head embodiments within a lock interface member.

[0107] FIGS. 38(a)-38(b) respectively show perspective views of another locking head embodiment in an unlocked and a locked configuration.

[0108] FIGS. 38(c)-38(d) respectively show outward views of the locking head embodiments in FIGS. 38(a)-38(b) when they are within a lock interface member.

[0109] FIGS. 39(a)-39(b) respectively show perspective views of another locking head embodiment in an unlocked and a locked configuration.

[0110] FIGS. 39(c)-39(d) show side cross-sectional views of the locking head embodiments in FIGS. 39(a)-39(b) when they are within a lock interface member.

[0111] FIGS. 40(a)-40(b) respectively show perspective views of another locking head embodiment in an unlocked and a locked configuration.

[0112] FIG. 40(c) shows an outward view of the locking head embodiment shown in FIG. 40(b) when it is inside of a lock interface member.

[0113] FIGS. 40(d)-40(e) show side cross-sectional views of the locking head embodiments in FIGS. 40(a)-40(b) when they are within a lock interface member.

[0114] FIGS. 41(a)-41(b) respectively show perspective views of another locking head embodiment in an unlocked and a locked configuration.

[0115] FIGS. 41(c) and 41(d) show additional views of the locking head embodiments in FIGS. 41(a)-41(b) when they are within a lock interface member.

[0116] FIGS. 42(a)-42(b) respectively show perspective views of another locking head embodiment in an unlocked and a locked configuration.

[0117] FIG. 42(c) shows a side view of the locking head embodiment shown in FIGS. 42(a)-42(b).

[0118] FIGS. 43(a)-43(b) respectively show perspective views of another locking head embodiment in an unlocked and a locked configuration.

[0119] FIGS. 43(c)-43(d) respectively show an engagement element in an unlocked and a locked configuration.

[0120] FIGS. 44(a)-44(b) respectively show perspective views of another locking head embodiment in an unlocked and a locked configuration.

[0121] FIGS. 44(c)-44(d) respectively show an engagement element in an unlocked and a locked configuration.

[0122] FIGS. 45(a)-45(b) respectively show perspective views of another locking head embodiment in an unlocked and a locked configuration.

[0123] FIGS. 45(c)-45(d) respectively show an unlocked and a locked configuration of an exemplary engagement element.

[0124] In the Figures, like numerals designate like elements.

DETAILED DESCRIPTION

[0125] Embodiments of the invention are directed to security apparatuses, methods for using security apparatuses, and systems using such security apparatuses. The security apparatuses can be used to prevent or deter the theft of devices such as portable electronic devices.

[0126] In addition, in embodiments of the invention, a lock interface member may be used to enhance security and to improve the strength of the coupling between a portable electronic device and a security apparatus. The lock interface member may be an attachment that may be attached to the housing of the portable electronic device, or it may be integrally formed in the housing or other component of the portable electronic device. For example, in some embodiments, the lock interface member may be integrally formed with (e.g., a wall portion of a wall or chassis portion of a chassis, and the lock interface member may be formed from the same material without an interface), or operatively or physically coupled to the chassis of the portable electronic device and/or may be operatively or electrically coupled to some electrical component (e.g., a memory chip, disk drive, or microprocessor) in the portable electronic device. In addition, if the lock interface member is a separate component from the wall of the portable electronic device, the lock interface member may be positioned within an aperture formed in a wall of the portable electronic device, or inside of the portable electronic device. Exemplary lock interface members are described in further detail below.

[0127] By using a lock interface member, the strength of the coupling between the security apparatus and the lock interface member is increased over a conventional physical security system including a portable electronic device comprising only a 3 x 7 mm^2 security slot and a physical security apparatus secured to the portable electronic device via the security slot. A conventional security system such as this can withstand 150 lbs of force, because the plastic housing of the portable consumer device can fail or break when this magnitude of force is applied. Also, current locks on the market are designed to withstand 300 lbs of force before they are broken. Further, the ability to "torque" the conventional security apparatus out of a security slot is also of concern. Improved security apparatuses and systems are therefore desirable.

[0128] Using embodiments of the invention, the strength of the coupling between the security apparatus and the portable electronic device may be increased by at least 2, 6, or even 8 times compared to conventional systems. For example, by using embodiments of the invention, it may take more than about 300 lbs of force, or even more than about 500, 1000, or 2000 lbs of force to break the physical coupling between the head in a security apparatus and the lock interface member associated with the portable electronic device to which it is secured. As shown below, the engagement elements and stabilizing elements are preferably cooperatively structured with the internal surfaces of the lock interface member. The potential contact area between the engagement element and the inner surfaces of the lock interface member is more than in a conventional locking system. For example, in some embodiments, the contact area between the lock interface member and parts of a corresponding locking head can be at least about 5 times greater than conventional security systems. This increased contact area can also provide for better load distribution when stresses are applied to mating surfaces. The engagement elements and the stabilizing elements are also stronger than conventional elements in conventional locks, and weak links are reduced as compared to conventional security systems. Accordingly, embodiments of the invention are stronger and therefore more effective at deterring and preventing the theft of portable electronic devices than conventional security systems.

[0129] A security apparatus according to an embodiment of the invention may comprise a head and a security device. The head and the security device may be physically and/or operationally coupled together.

[0130] The security device may comprise a cable, or some other type of device to provide security. If the security device comprises a cable, then the cable may be secured to an immovable object such as a desk or cabinet so that a portable electronic device coupled to the cable cannot be removed. The cable may comprise stainless steel, Kevlar®, or some other type of strong material.

[0131] In another embodiment, the security device may comprise a wireless device such as a wireless transmitter and/or receiver. The wireless device may be used in a proximity detection system or a motion detection system. For example, a motion detector could present in the wireless device so that when the motion detector moves, an associated alarm is triggered. The alarm may be in the security device or may be external to the security device. In another embodiment, there may be a base device associated with the wireless device, and these components may be used in a proximity detection system. Wireless signals may be transmitted between the security device and the base device, and when these devices are separated by a predetermined distance, an associated alarm (e.g., an audible alarm) may be triggered. The alarm could be in the base device or in the security device. The electronics associated with such wireless systems are known to those of ordinary skill in the art.

[0132] The head in the security apparatus may be a locking head. A locking head according to an embodiment of the invention may comprise a locking mechanism such as a key locking mechanism or a combination locking mechanism disposed within a locking head housing. Various types of locking heads are described in further detail below.

[0133] In some embodiments, a locking head according to an embodiment of the invention includes at least one engagement element that is inserted into an aperture in the lock interface member and engages at least one protrusion in the lock interface member. In some embodiments, the at least one engagement element may comprise lobes that can be cooperatively structured with and can engage the at least one protrusion in the lock interface member.

[0134] The at least one engagement element can engage the at least one protrusion in the lock interface member in any suitable manner. For example, the at least one engagement element can be inserted into an aperture in the lock interface member and past at least one internal protrusion in the lock interface member. Once the at least one engagement element is inserted past the at least one protrusion, it can be rotated, or otherwise moved to engage the at least one protrusion. The engagement between the at least one engagement element and

the at least one protrusion could be a single point of contact between them, or could be a continuous interface between contacting surfaces of the engagement element and the at least one protrusion. In some embodiments, at least 2, 3, or even 4 or more distinct continuous surfaces of the protrusion can be in contact with and/or facing at least 2, 3, or even 4 or more continuous surfaces of the engagement element when the engagement element is engaged to the protrusion.

[0135] At least one stabilizing element is also present in the locking head to stabilize the position of the locking head relative to the lock interface member. The stabilizing element can take various forms. For example, the stabilizing elements can be in the form of pins, pillars, etc., and may be integrally formed with other portions of the locking head. The stabilizing element may or may not engage protrusions in the lock interface member, and may or may not be inserted into the same aperture in the locking interface member as the at least one engagement element.

[0136] To secure the locking head to the interface member, the engagement element can be associated with (e.g., contact, engage, etc.) the lock interface member before or after the stabilizing element is associated with the lock interface member. For example, in some embodiments, the engagement element can first engage the lock interface member. Then, the stabilizing element can be inserted into the lock interface member to secure the locking head to the lock interface member. In other embodiments, the stabilizing element may first be inserted into the lock interface member and then the engagement element may engage the lock interface member.

[0137] The portable electronic device that is to be secured may comprise any suitable device. Examples of such devices comprise portable computers such laptop, desktop, and server computers, flat panel televisions, projectors, printers, monitors, portable music players, printers, external hard-drives, cell phones, etc.

[0138] FIG. 1 shows a system comprising a portable electronic device **30** and a security apparatus **26** that is used to secure the portable electronic device **30** to an immovable object **10** such as a desk leg or the like. The security apparatus **26** comprises a head **28** and a cable **32** coupled to the head **28**, which may be a locking head in this example. A loop **34** is at a terminal end of the head **28**. The cable **32** may comprise a strong material such as stainless steel or Kevlar™.

[0139] To secure the portable electronic device **30** to the immovable object, the cable **32** may be wrapped around the immovable object and the head **28** may pass through the loop **34**. An engagement element in the head **28** may then be inserted into an aperture in the portable electronic device **30**, or in an aperture in a lock interface member that is associated with the portable electronic device **30**. A stabilizing element may then be inserted into the aperture in the lock interface member to stabilize the head **28** so that the engagement element cannot be readily withdrawn from the aperture. In other embodiments, the stabilizing element may first be inserted into the aperture in the lock interface member, and/or an aperture in the portable electronic device, and the engagement element may thereafter be inserted therein to engage the aperture in the portable electronic device or in the lock interface member.

[0140] A locking mechanism including any suitable key locking mechanism or combination locking mechanism may be used to keep the stabilizing element and/or the engagement element from moving or not moving. Some specific locking mechanisms are described in this application. Other locking mechanisms that are known to those of ordinary skill in the art could alternatively be used to actuate stabilizing and/or engagement elements to secure a locking head to a lock interface member.

[0141] As used herein, in the above described embodiments and in other embodiments, an "aperture" may include a blind aperture or a through aperture. A through aperture may be in the form of a hole, or a recess. Apertures according to embodiments of the invention can be of any suitable size, but preferably have dimensions less than about 10 mm in some embodiments.

[0142] As noted above, an embodiment of the invention is directed to a security apparatus for use with a lock interface member having an aperture and a protrusion (i.e., at least one protrusion). The protrusion can form part of an internal surface of the lock interface member, and there can be one, two, three, or more protrusions in the lock interface member. The protrusions may have the same or different configurations and they be may regularly or irregularly spaced inside of the lock interface member. Also, the protrusions may have slanted surfaces, and the size and/or dimensions (e.g., an axial dimension) of the protrusions may be proportionate or inversely proportionate to lobes on an engagement element in a locking head.

[0143] Also, as noted above, the security apparatus comprises a head comprising at least one engagement element that is adapted to engage the lock interface member via the aperture and the at least one protrusion. The at least one engagement element is preferably cooperatively structured with the at least one protrusion, and the locking head also comprises a stabilizing element that is capable of being inserted into the lock interface member to prevent the locking head from being separated from the lock interface member. A security device may be coupled to the head.

[0144] Generally, when the locking head, or parts of the locking head, are in an "unlocked configuration," the locking head is generally removable from the lock interface member. When the locking head or parts of the locking head are in a "locked configuration," the locking head is not removable from the lock interface member when it is present in a lock interface member.

[0145] The parts of the locking head and/or the lock interface member may be made of any suitable material, and may be formed in any suitable manner. Suitable materials include materials such as stainless steel, nickel alloys, etc. They can be formed by machining, molding, etc.

[0146] A number of specific embodiments will now be described. It is understood that the descriptions above, and the features of the different embodiments may be combined in any suitable manner and may still be within embodiments of the invention. For example, the description of the exemplary materials for the lock interface member and/or the locking head above may be applicable to any of the specific embodiments described below.

[0147] FIG. 2(a) shows a front perspective view of a security apparatus **200** according to an embodiment of the invention. The security apparatus **200** comprises a head **200(a)** comprising a body **214** attached to a cable ring **218**. A ferrule holder **209** and a ferrule **210** are attached to the cable ring **218**. The ferrule holder **209** and the body **214** may form a base or housing.

[0148] In this embodiment, the head **200(a)** comprises an engagement element **205** that is rotatable. It also comprises a number of cross-members **204(a)** and depressions **204(b)** formed between the cross-members **204(a)**. The engagement element **205** may also be characterized as having alternating wider cross-member portions and narrower axial shaft portions.

[0149] The head **200(a)** also comprises two stabilizing elements **202(a)** that are on opposite sides of the engagement element **205**. The two stabilizing elements **202(a)** are in the form of stationary pins in this embodiment.

[0150] FIG. 2(b) shows a rear view of the head **200(a)**. The rear of the head **200(a)** has a keyway for receiving a key. The keyway is circular and can receive a key with a circular cross-section.

[0151] FIG. 2(b) also shows a side view of a portable electronic device **208** comprising an aperture **208(a)**, and a lock interface member **206** disposed in the aperture **208(a)** of the portable electronic device **208**. The lock interface member **206** may also have its own aperture **206(f)**. As shown in FIG. 2(b), the lock interface member **206** may have lateral ends which are somewhat rectangularly shaped, and a central portion which has upper and lower curved portions. The rectangularly shaped portions can be cooperatively structured with the stabilizing elements **202(a)**, **202(b)** and may receive them. The rectangular shaped portions may include generally straight sides. Further details regarding the lock interface member **206** are provided below.

[0152] FIG. 2(c) shows an exploded view of the security apparatus **200** shown in FIGS. 2(a) and 2(b). FIG. 2(c) shows a body **214** in the form of a cylinder. The body **214** is coupled to an abutment structure **202** via pins **216(a)**, **216(b)**. The pins **216(a)**, **216(b)** pass through holes **214(a)**, **214(b)** in the body **214**, and holes in the abutment structure **202** (one of which is hole **202(c)**). The abutment structure **202**, in this example, comprises a cylindrical structure **202(d)** with stabilizing elements **202(a)**, **202(b)** in the form of pins extending axially from the cylindrical structure **202(d)**. The stabilizing elements **202(a)**, **202(b)** in this embodiment and in other embodiments can have any suitable cross-sectional shape including a circular, square, or rectangular cross-sectional shape.

[0153] A locking mechanism comprising a first fixed cylinder **210** and a second rotatable cylinder **212** are inside of the body **214**. The first fixed cylinder **210** comprises a plurality of axially extending holes **210(a)** surrounding a central hole **210(b)**. Likewise, the second cylinder **212(b)** comprises a plurality of axially extending holes **212(a)** around another central hole **212(b)**.

[0154] A locking spindle **204** passes through the central hole **210(b)** in the first fixed cylinder **210** and is engaged with the second cylinder **212** via its central hole **212(b)** at its rear end **204(d)**. The locking spindle **204** also includes a central portion **204(c)** and a front

Ex. 1002 - Page 667 of 997

portion which may form the engagement element **205**. The engagement element **205** may comprise cross-members **204(a)** and depressions **204(b)** as discussed previously.

[0155] A snap ring **219**, a ferrule holder **209**, and a cable ferrule **210** are attached to the cable ring **218**. The abutment structure **202** may fit within a hole **218(a)** in the cable ring **218**. A lock interface member **206** is also shown in FIG. 2(f), and can receive the engagement element **205**, as well as the stabilizing elements **202(a)**, **202(b)**.

[0156] In operation, referring to FIGS. 2(a)-2(f) the engagement element **205** and the stabilizing elements **202(a)**, **202(b)** are inserted into the lock interface member **206**. As shown in FIG. 2(a), the cross-members **204(a)** are aligned with the stabilizing elements **202(a)** as the engagement element **205** and the stabilizing elements **202(a)** are inserted into the aperture **206(f)** in the lock interface member **206**. At this point, the head **200(a)** and its components are in an unlocked configuration, and can be readily inserted into or withdrawn from the lock interface member **206**. After the stabilizing elements **202(a)**, **202(b)**, and the engagement element **205** are inserted into the interface member **206**, a key (not shown) is inserted into the rear keyway in the head **200(a)**. The key is then turned and this in turn rotates the engagement element **205** clockwise (or counterclockwise in other embodiments). At this point, the cross-members **204(a)** of the engagement element **205** are not aligned with the stabilizing elements **202(a)**. Once the key is withdrawn from the rear keyway in the head **200(a)**, the head **200(a)** and its components can be in a locked configuration.

[0157] As shown in FIGS. 2(d), 2(e), and 2(f), the rotation of the engagement element **205** causes the cross-members **204(a)** to fill depressions **206(b)** inside of the lock interface member **206**. It also causes the protrusions **206(a)** inside of the lock interface member **206** to fill the depressions **206(b)** between the cross-members **204(a)**. The engagement element **205** is therefore strongly interlocked with the lock interface member **206** so that the head **200(a)** cannot be separated from the lock interface member **206** and cannot be separated from the portable electronic device **208**. As shown in FIGS. 2(d) and 2(e), the lock interface member **206** may be attached to or may be part of a chassis **201** inside of the portable electronic device **208**.

[0158] FIGS. 2(g)-2(k) show various views of the previously described head embodiment. Exemplary dimensions of parts of the locking head are shown in millimeters in FIGS. 2(g) and 2(j). Other dimensions for such parts could be present in other embodiments of the invention. Generally, the frontal dimensions of the previously described cross

members **204(a)** in this embodiment and in other embodiments may less than about 10 mm (e.g., about 5 by 7 mm^2), when the thickness of each cross-member **204(a)** may be 2.75 mm or about 2.25 mm. The thicknesses of the different cross-members **204(a)** can be different or may be the same. As shown in FIG. 2(g), a depression **204(b)** between two adjacent cross members **204(c)** may be less than about 2 mm (e.g., about 1.75 mm).

[0159] FIG. 3(a) shows another embodiment of the invention. FIG. 3(a) shows a system including a portable electronic device **308** comprising an aperture **308(a)**, and a lock interface member **306** in the aperture **308(a)**. The lock interface member **306** has opposing curved walls **306(b)** and opposing rectangular ends **306(a)**, and may have its own aperture **306(f)**.

[0160] FIG. 3(a) also shows a security apparatus **300** comprising a head **300(a)** comprising an engagement element **304** at a front end, and a push cylinder **324** at a rear end. A cable ring **318** including an attachment portion **318(b)** and a body **314** form a housing for the head **300(a)**. A cable ferrule **310** extends from the attachment portion **318(b)**. These components are disposed between the ends of the push cylinder **324** and the engagement element **304**. A rubber bumper **312** also surrounds the engagement element **304**. In this example, the engagement element **304** would have a fixed position relative to the body **314** and/or the cable ring **318**. As in prior embodiments, the engagement element **304** includes cross-members **304(a)** and depressions **304(b)** between the cross-members **304(a)**.

[0161] A method for using the security apparatus shown in FIG. 3(a) can be described with reference to FIGS. 3(b)-3(e). As shown in FIG. 3(b), the engagement element **304** is inserted into the lock interface member **306**. At this time, the push cylinder **324** is in an extended position and a biasing element such as a spring (not shown) in the head **300(a)** is in an uncompressed state.

[0162] Referring to FIGS. 3(c) and 3(d), the entire head **300(a)** is rotated so that the engagement element **304** is correspondingly rotated (e.g., 90 degrees). The cross-members **304(a)** and the depressions **304(b)** are cooperatively structured with and engage protrusions **306(c)** in the lock interface member **306**. The head **300(a)** is thereafter engaged with the lock interface member **306** and the portable electronic device **308**.

[0163] A cross-section of the lock interface member **306** is shown in FIG. 3(d). In this example, the aperture **306(f)** is a blind aperture, because the lock interface member **306** has a rear wall **306(h)**. In other embodiments, the rear wall **306(e)** could be omitted, and in

this case, the lock interface member **306** would be a through aperture. The lock interface member **306** may comprise the same or different materials than the previously described lock interface members.

[0164] The inside of the lock interface member **306** has a number of internal protrusions **306(c)** (e.g., ribs) that fill a portion of the radial cross-section of the aperture **306(f)** in the lock interface member **306**. The edges of the internal protrusions **306(c)** in the lock interface member **306** shown in FIG. 3(d) may be defined by chords which extend from one part of the inner wall of the lock interface member **306** to another part of the inner wall of the lock interface member **306**. The protrusions can be in any suitable form including bumps, plates, cylinders, pyramids, etc.

[0165] In FIG. 3(d), the lock interface member **306** has four internal protrusions **306(c)**. In this example, a pair of opposing internal protrusions is disposed towards the front of the aperture **306(f)** and a pair of opposing internal protrusions is disposed towards the rear of the aperture **306(f)**. As explained above, the internal protrusions **306(c)** are received in depressions **304(b)** in the engagement element **304** when the engagement element **304** is engaged to the lock interface member **306**. The walls defining the slots **306(a)** also define the aperture **306(f)** in this example.

[0166] The lock interface member **306** also comprises at least one slot **306(a)** configured to receive a movable or non-movable stabilizing element. In this example, there are two such slots (one is shown in FIG. 3(d)) between the opposing pairs of protrusions **306(c)**. However, in other embodiments, there may be more or less stabilizing element receiving slots **306(a)** in the lock interface member **306**.

[0167] As shown in FIG. 3(d), the lock interface member **306** also comprises a number of external protrusions **306(d)** and **306(e)**. These external protrusions **306(d)**, **306(e)** can be used to secure the lock interface member **306** to the portable electronic device **308**. Alternatively, the lock interface member **306** could be an integral part of a portion of a portable electronic device.

[0168] FIG. 3(e) shows a horizontal cross section of the lock apparatus when at least one stabilizing element **330** and at least one engagement element **304** is present in the lock interface member **304**. As shown in FIG. 3(e), the internal protrusions **306(c)** in the lock interface member **306** fill the depressions **304(b)** between the protrusions **304(a)** in the

engagement element **304**. Consequently, the engagement element **304** is secured to the lock interface member **306** and the portable electronic device **308**.

[0169] FIGS. 3(f)-3(h) show how a stabilizing element **330** in the lock apparatus can be inserted into the lock interface member **306**. After the engagement element **304** is engaged with the lock interface member **306** as shown in FIG. 3(c), a user may push the push cylinder **324** inward as shown in FIG. 3(f). As shown in FIGS. 3(g) and 3(h), the stabilizing elements **330(a)**, **330(b)** then fill the opposing slots (including slot **306(a)**) in the lock interface member **306** to stabilize the position of the engagement element **304** and the locking head **300(a)**. The locking mechanism associated with the stabilizing element **330** can be the same as or different than the locking mechanism that is associated with the stabilizing element **102** shown in FIG. 2(e) in U.S. provisional application nos. 60/853,888, filed on October 23, 2006; and 60/909,867, filed on April 3, 2007. For example, as in the embodiment described in FIG. 2(e), to unlock the head **300(a)**, a key may be used and to turn a spindle which in turn causes a clip to disengage from the spindle. A biasing element such as a spring can then be used to push the stabilizing elements towards the rear of the lock head and are withdrawn from the slots in the lock interface member **306**.

[0170] FIGS. 3(i)-3(l) show front, side cross-sectional, perspective, and top views of the lock interface member **306**. Various dimensions are also shown in millimeters. As shown, the width of the aperture **306(f)** may be about 10 mm or less, while the height of the aperture **306(f)** may be about 6.5 mm or less. Opposing internal protrusions **306(c)** may be spaced apart by about 2.85 mm or less in some embodiments.

[0171] The lock interface member **306** includes a main portion **306(b)** which may be generally cylindrically shaped. External protrusions **306(d)** may extend outward from the main portion **306(b)**. The external protrusions **306(d)** may be used to secure the lock interface member **306** to a portable electronic device. The lock interface member **306** has a low profile so that it can be incorporated into a thin portable electronic device such as a laptop computer. However, it also has a high internal surface area so that its strength is improved over a traditional security slot in a conventional laptop computer.

[0172] FIG. 3(m) shows another lock interface member **306-2** according to an embodiment of the invention. Lock interface member **306-2** includes two lateral wings **306(i)** with holes. Securing elements such as bolts or screws may be inserted into the holes so that the lock interface member can be secured to a portion (e.g., an internal chassis) of a

portable electronic device. FIG. 3(n) shows a similar lock interface member **306-3** with only one wing **306(j)**.

[0173] FIG. 4(a) shows another embodiment of the invention. FIG. 4(a) shows a security apparatus **600** comprising a head **600(a)**. The head **600(a)** comprises a body **628**, and a ferrule holder **631**. The head **600(a)** also comprises stationary first and second stabilizing elements **604(a)**, **604(b)**, and a rotatable engagement element **602**. In other embodiments, the stabilizing elements **604(a)**, **604(b)** could be retractable. In this example, the stabilizing elements **604(a)**, **604(b)** are about 120 degrees apart.

[0174] The rotatable engagement element **602** comprises a shaft and a plurality of lobes on the shaft. In this example, the lobes comprise first, second, and third lobes **602(a)**, **602(b)**, **602(c)**. As will be described in further detail below, the different lobes **602(a)**, **602(b)**, **602(c)** have different axial lengths. In other embodiments, the lobes **602(a)**, **602(b)**, **602(c)** may have the same lengths.

[0175] The rotatable engagement element **602** and the first and second stabilizing elements **604(a)**, **604(b)** can engage and interface with the lock interface member **610**. The lock interface member **610** comprises an aperture **610(e)** defined by a wall **610(d)**. In this example, the wall **610(d)** has a circular shape. The lock interface member **610** also comprises a pair of external protrusions **610(a)**, **610(b)** so that the lock interface member **610** can be secured to chassis of a portable electronic device or the like. In other embodiments, the lock interface member **610** could have a boss with a screw or other attachment mechanism. It could also be part of a computer chassis or could be molded into a computer housing or the like.

[0176] FIG. 4(a) also shows an internal protrusion **610(c)** which is axially shaped and extends inwardly from the wall **610(d)**. As will be explained in further detail below, the protrusion **610(c)** can engage one of the lobes on the engagement element **602** to secure the security apparatus **600** to the lock interface member **610**.

[0177] As shown in FIG. 4(b), the engagement element **602** can be inserted into the aperture **610(e)** in the lock interface member **610**. To secure the security apparatus **100** to the lock interface member **610**, the lobes **602(a)**, **602(b)**, **602(c)** may be inserted inward, between and past adjacent protrusions (e.g., **610(c)**) in the lock interface member **610**.

Ex. 1002 - Page 672 of 997

[0178] As shown in FIG. 4(c), the engagement element **602** can be rotated after it is fully inserted into the aperture **610(e)** in the lock interface member **610**. In this example, the engagement element **602** can be rotated 60 degrees (e.g., by using a key, or rotating the entire locking head) so that the lobes **602(a)**, **602(b)**, **602(c)** may be positioned behind corresponding protrusions in the lock interface member **610**. The first and second stabilizing elements **604(a)**, **604(b)** shown in FIG. 4(a) would then be inserted into corresponding slots in the lock interface member **610** so that the head **600(a)** is secured to the lock interface member **610** and to the portable electronic device (not shown) to which the lock interface member **610** is attached.

[0179] As illustrated in FIGS. 4(a)-4(c), embodiments of the invention may be directed to a method for securing a security apparatus **100** of the type shown in FIGS. 4(a)-4(c). The security apparatus **600** comprises a head **600(a)**. The method comprises inserting the engagement element **602** into an aperture **610(e)** in the lock interface member **610**, moving the engagement element **602** so that the engagement element **602** is secured to the lock interface member **610** via the aperture **610(e)**, and wherein at least a portion of the engagement element **602** engages the protrusion **610(c)**, and inserting the stabilizing element **604(a)** into the lock interface member **610**. In the specifically described examples, the stabilizing element **604(a)** is stationary. However, in other embodiments, the stabilizing element **604(a)** may be retractable and movable relative to other parts of the head **600(a)** in the security apparatus **600**. Suitable methods of use may also comprise wrapping a cable attached to the head **600(a)** around an immovable object, inserting the head into the loop, and securing the head **600(a)** to a portable electronic device comprising the lock interface member **610**.

[0180] FIG. 4(d) shows a cross-sectional view of a system including the security apparatus **600** and the lock interface member **610**. FIG. 4(d) shows the shape of the protrusion **610(c)** and the engagement element **602**. As shown, the protrusion **610(c)** has a sloped surface **610(c)-1** (about 45 degrees) which can interface with a corresponding sloped surface **602(a)-1** on the lobe **602(a)** on the engagement element **602**. The sloped surface **610(c)-1** and the sloped surface **602(a)-1** may form a 45 degree angle (or more or less than this) with the axis of the engagement element **602**. The protrusion **610(c)** fits into a gap **602(e)** defined by the outer surface of the engagement element **602**. It is understood that although a protrusion **610(c)** with a sloped surface **610(c)-1** is shown in the security system in FIG. 4(d), this feature may be used in any of the previously described embodiments as well.

In other embodiments, the surfaces **610(c)-1** and **602(a)-1** need not be sloped, but could be perpendicular to the axis of the engagement element **602**. As shown in FIG. 4(d), at least 3 (or even 4) external surfaces of the engagement element **602** face at least 3 (or even 4) distinct surfaces of the protrusion **610(c)**.

[0181] The engaged, opposing sloped surfaces **610(c)-1**, **602(a)-1** improve the strength of the bond between the security apparatus **600** and the lock interface member **610**. For example, if one tries to disengage the security apparatus **600** and the lock interface member **610** by pulling the security apparatus **600** in the direction F2, the engaged, opposing sloped surfaces **610(c)-1**, **602(a)-1** cause any force to be applied to the lock engagement element **610** in a radial direction (e.g., in the direction F1) as well as in an axial direction (e.g., in the direction F1). Since there is a plurality of such slanted surfaces on corresponding lobe/protrusion pairs, any pulling forces can be evenly distributed around the engagement element **602**. If the protrusion **610(c)** had a flat surface perpendicular to the axis of the engagement element **602**, then the protrusion **610(c)** would bear substantially all of the force applied in the axial direction (e.g., direction F2), thereby subjecting protrusion **610(c)** to a greater amount of force and increasing the likelihood that protruding portion **610(c)** might break.

[0182] FIGS. 5(a)-5(c) show perspective, front, and side views of the head **600(a)**. Many of the features in FIGS. 5(a)-5(c) are described above. FIGS. 5(a)-5(b), however, more clearly show three lobes **602(a)**, **602(b)**, **602(c)** on the shaft of the engagement element **602**. They protrude radially from the axis of the engagement element **602**, but are elongated in the direction of the axis of the engagement element **602**. As shown in FIG. 5(a), the lobes **602(a)**, **602(c)** have different lengths, and the slanted surfaces of the lobes **602(a)**, **602(b)**, **602(c)** may contact the protrusions in the lock interface member in different planes perpendicular to the axis of the engagement element. This is illustrated by the lines **611** in FIG. 5(c), where each line may represent a different perpendicular plane corresponding to corresponding to an end portion of the lobe **602(a)**, **602(b)**, **602(c)**.

[0183] FIG. 5(b) more clearly shows the lobes **602(a)**, **602(b)**, **602(c)** being located 120 degrees apart from each other, and also two stabilizing elements **610(a)**, **610(b)** being located approximately 120 degrees apart from each other. Although specific angular relationships between the lobes **602(a)**, **602(b)**, **602(c)** and the stabilizing elements **610(a)**, **610(b)** are described and a specific number of lobes and stabilizing elements are shown in the

Figures, it is understood that embodiments of the invention may include any suitable number of lobes and stabilizing elements in any suitable relative relationships.

[0184] FIG. 6(a) shows a front view of the previously described lock interface member **610**. As shown in FIG. 6(a), the lock interface member **610** has external protrusions **610(a)**, **610(b)** which allows the lock interface member **610** to be secured to a portable electronic device (not shown). The wall **610(d)** may define two slots **610(e)-1**, **610(e)-2** which may receive the previously described stabilizing elements **604(a)**, **604(b)** (see FIG. 5(a)). In this example, the slots **610(e)-1**, **610(e)-2** may be co-extensive with the aperture **610(c)**. However, in other embodiments, the slots which receive the stabilizing elements **604(a)**, **604(b)** may be separately formed from aperture **610(e)**. For example, the slots could be in the form of stabilizing apertures specifically designed to receive stabilizing elements. The internal and external dimensions of the lock interface member **610** can be substantially the same as or different than the exemplary dimensions of the previously described lock interface members.

[0185] The use of the slots **610(e)-1**, **610(e)-2** is particularly advantageous. Each slot can receive a stabilizing element, and the slots **610(e)-1**, **610(e)-2** may be spaced apart. When stabilizing elements are present within them, it is very difficult for one to torque out any locking head that may be engaged with the lock interface member **610**.

[0186] As shown in FIGS. 6(a) and 6(b), the internal protrusions **610(c)-1**, **610(c)-2**, and **610(c)-3** are spaced about 60 degrees apart from each other. Although three internal protrusions are shown in FIGS. 6(a) and 6(b), in other embodiments, there can be more or less internal protrusions.

[0187] FIG. 6(a) also shows axial views of three protrusions **610(c)-1**, **610(c)-2**, **610(c)-3** which may extend radially inward. As shown, the inner radial surfaces of the protrusions **610(c)-1**, **610(c)-2**, **610(c)-3** may be curved to receive the curved outer surface of the shaft of the engagement element **602**. As explained previously, rear surfaces of the protrusions **610(c)-1**, **610(c)-2**, **610(c)-3** may be slanted to help distribute any axial pulling force on the head.

[0188] FIG. 6(b) shows another lock interface member **610**. It is similar to the lock interface member **610** shown in FIG. 6(a), except that the protrusions **610(c)-1**, **610(c)-2**, **610(c)-3** are positioned about 120 degrees from the corresponding protrusions **610(c)-1**, **610(c)-2**, **610(c)-3** in FIG. 6(a).

[0189] FIGS. 7(a)-7(c) shows cross-sectional views of the lock interface member **610**. As shown in FIGS. 7(a)-7(c), the three protrusions **610(c)-1**, **610(c)-2**, **610(c)-3** may be elongated and may have different lengths. In other embodiments, they may have the same lengths. End portions of the protrusions **610(c)-1**, **610(c)-2**, **610(c)-3** can be spaced more than about 5 mm (e.g., about 5.25, 6.75, and 7.75 mm) from the entrance of the lock interface member **610** in the illustrated embodiment.

[0190] FIG. 8 shows an exploded view of a head **600(a)** and lock interface member **110** according to one embodiment of the invention. In this specific embodiment, a disk lock mechanism is shown. It is understood that any other type of lock mechanism (e.g., a tumbler lock mechanism) can be used in the security apparatus **600** including those that have been previously described.

[0191] FIG. 8 shows a key **620** which can be used with the head **600(a)**. The head **600(a)** comprises a lock body **628** and a ferrule holder **631** (or cable ring) which can form a housing for the head **600(a)**. Pins **624** may be used to secure an anti-rotation plate **646** with stabilizing elements **604(a)**, **604(b)** to the lock body **628**. The engagement element **602** passes through a central hole in the anti-rotation plate **646**.

[0192] The engagement element **602** is part of a locking spindle **644**, which has a rear housing including a longitudinal slot **644(a)**. The longitudinal slot **644(a)** receives a lock pin **640** when the lock is in a locked position. In the locked position, the edges of the disks in a set of disks **630** can push the pin **640** outward and into the longitudinal slot **644(a)** and into a longitudinal groove (not shown) in the inner surface of the lock body **628** so that the locking spindle **644** cannot rotate.

[0193] On the other hand, the correct key **620** can be used to turn the disks in the set of disks to appropriate radial positions so that the notches **628(b)** in the disks align. As a result, the lock pin **640** can be received in the aligned notches, and the lock pin **640** falls out of the longitudinal groove in the lock body, thereby allowing the locking spindle **644** to rotate. An ear **628(a)** on each disk can prevent the disk from rotating beyond a predetermined point. Other components illustrated in FIG. 8 include a key plate **627**, a compression spring **626**, as well as an alignment disk **642**.

[0194] The embodiments that are described with respect to FIGS. 4-8 have a number of advantages. For example, as explained above, the bond between the security apparatus and the lock interface member is very strong, because there is a good deal of contact area

between the lock interface member and the components of the security apparatus. Also, any axial pulling force applied to the lock head is distributed in different directions so that one part of the lock interface member does not have to bear all of the applied force.

[0195] A number of additional locking head embodiments, and corresponding locking head/interface member combinations, are shown in FIGS. 9-45. It is understood that any of the embodiments shown in FIGS. 9-45 can be used with any of the previously described embodiments (e.g., the system in FIG. 1, the lock mechanism shown in FIG. 2(c), the previously described lock interface members, etc.). Also, although specific locking mechanisms are not shown in FIGS. 9-45, it is understood that suitable locking mechanisms can be used to actuate the engagement elements and/or stabilizing elements shown in FIGS. 9-45 can be determined by those of ordinary skill in the art.

[0196] FIGS. 9(a) and 9(b) show another example of a locking head **900** according to another embodiment of the invention. The locking head **900** comprises a first portion **902** including a generally cylindrically-shaped base **902(a)** with a plurality of integrally formed stabilizing elements **902(b)** extending radially outward therefrom. An additional stabilizing element **902(c)** may extend axially and integrally from the base **902(a)**, and may be configured as a trough, which partially contains a second portion in the form of a movable engagement element **904**. As shown in FIG. 9(a), the locking head, and more particularly, the engagement element **904** may be in an unlocked configuration and may be closer (i.e. proximate) to the stabilizing element **902(c)**, while the engagement element **904** is further (i.e., distal) to the stabilizing element **902(c)** when the engagement element **904** is in the locked configuration shown in FIG. 9(b). As shown, the engagement element **904** can move radially into and out of the trough formed by the stabilizing element **902(c)**.

[0197] FIG. 9(c) shows parts of the first and second portions **902**, **904** of the locking head **900** being within an aperture in the lock interface member **610**. The locking head **902** is in a locked configuration in FIG. 9(c), since the second portion **904** including the engagement element is engaged to an internal protrusion in the lock interface member **610**. FIG. 9(d) shows an outward view of the locking head **900** and lock interface member **610** combination shown in FIG. 9(c). As shown in FIG. 9(d), the stabilizing element **902(c)** is between two adjacent internal protrusions in the lock interface member **610**.

[0198] FIG. 10(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **910** includes a base **912** (which may be part

of a housing of the locking head **910**) as well as first and second arms **914**, **916** coupled to the base **912** via a hinge **918**. Each arm **914**, **916** includes a linear portion **914(a)**, **916(b)** and an engagement portion **914(b)**, **916(b)**. The arms **914**, **916** are connected at their terminal ends at the hinge **918** so that the arms **914**, **916** are part of a scissor-like mechanism. In this example, one arm (e.g., arm **914**) can be considered an engagement element while the other arm can be considered a stabilizing element (e.g., arm **916**).

[0199] As shown in FIG. 10(b), the arms **914**, **916** can open up to a locked configuration. As shown in FIG. 10(c), the engagement portions **914(b)**, **916(b)** can engage the internal protrusions in the lock interface member **610**, so that the locking head **910** is secured to the lock interface member **610**.

[0200] FIG. 11(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **920** includes a base **922** with radially extending stabilizing elements **922(a)** as well as first and second arms **924**, **926** coupled to the base **922** via a hinge **928**. Each arm **924**, **926** includes a linear portion **924(a)**, **926(b)** and an engagement portion **924(b)**, **926(b)**. The first and second arms **924**, **926** are connected at their terminal ends at the hinge **928**. Also, the first arm **924** includes a trough **924(c)** at its inner face, where the trough **924(c)** receives the second arm **926** (see FIG. 11(b)). In this example, one arm (e.g., arm **924**) can be considered an engagement element while the other arm can be considered a stabilizing element (e.g., arm **926**).

[0201] As shown in FIG. 11(c), the engagement portions **924(b)**, **926(b)** can engage the internal protrusions in the lock interface member **610**, so that the locking head **920** is secured to the lock interface member **610**. The engagement portions **924(b)**, **926(b)** face away from each other in this example.

[0202] FIG. 12(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **930** includes a base **932** with radially extending stabilizing elements **932(a)** as well as first and second arms **934**, **936** coupled to the base **932** via a pivot element **938**. Each arm **934**, **936** includes a linear portion **934(a)**, **936(a)** and an engagement portion **934(b)**, **936(b)**. The first and second arms **934**, **936** are connected though the pivot element **938**.

[0203] FIG. 12(b) shows an outward view of the top of the locking head **930** when it is in a lock interface member **610** in a locked position. As shown by the dotted lines in FIG. **12(b)**, the arms **934**, **936** can be inserted between adjacent internal protrusions in the lock

interface member **610**. Once the engagement portions **934(b)**, **936(b)** are inserted past the internal protrusions, the engagement portions **934(a)**, **934(b)** can rotate away from each other as shown in FIGS. **12(b)** and **12(c)**. Once this is done, as shown in FIG. 12(b), the locking head **930** cannot be separated from the lock interface member **610**.

[0204] FIG. 13(a) shows another locking head embodiment. The locking head **940** includes a base **942** with radially extending stabilizing elements **942(a)** as well as first, second, and third engagement elements **944**, **946**, **948** coupled to the base **932** via a pivot element (not shown). Each engagement element **944**, **946**, **948** includes a main portion **944(a)**, **946(a)**, **948(a)**, and an engagement portion **944(b)**, **946(b)**, **948(b)** integral with and extending from the main portion **944(a)**, **946(a)**, **948(a)**. As shown in FIG. 13(a), the engagement elements **944**, **946**, **948** can rotate independently of each other so that the locking head **940** can be in a locked configuration as shown in FIGS. 13(a) and 13(b), or in an unlocked configuration as shown in FIG. 13(c). As shown in FIG. 13(c), the engagement portions **944(b)**, **946(b)**, **948(b)** are all aligned so that they can be inserted past and between any adjacent internal protrusions in the lock interface member. Once the locking head **940** is in its proper position within the lock interface member, the engagement elements **944(b)**, **946(b)**, **948(b)** can be rotated independently of each other, so that they can engage corresponding internal protrusions in the lock interface member.

[0205] FIG. 14(a) shows another locking head embodiment. The locking head **950** includes a base **952** with radially extending stabilizing elements **952(a)** as well as first and second engagement elements **954**, **956** coupled to the base **952** via an attachment element **960** (see FIG. 14(c)). Each engagement element **954**, **956** includes a groove **954(a)**, **956(a)**, where the grooves **954(a)**, **956(a)** face away from each other. The first and second engagement elements **954**, **956** are also slidably coupled together via slanted surfaces **954(b)**, **956(b)**.

[0206] FIGS. 14(b) and 14(e) show the locking head **950** in a locked configuration while FIGS. 14(a) and 14(d) show the locking head **950** in an unlocked configuration. In the unlocked configuration, the first and second engagement elements **954**, **956** can freely move into and out of a lock interface member. However, in the locked configuration, the first and second engagement elements **954**, **956** are positioned slightly away from each other so that the grooves **954(a)**, **956(a)** can engage any internal protrusions in the lock interface member.

[0207] FIG. 15(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **960** comprise a base **962** and first linear element **964** extending from the base **962**. A movable engagement element **964(a)** is coupled to the first linear element **964** via a hinge **964(b)**. A second linear element **966** can be a stabilizing element and can be connected to one end of the movable engagement element **964(a)**.

[0208] As shown in FIG. 15(b), the second linear element **966** can actuate in an axial direction out of the base **962** to cause the movable engagement element **964(a)** to be perpendicular to the orientation of the first linear element **964**. Alternatively, the second linear element **966** can actuate in an axial direction into the base **962** to cause the movable engagement element **964(a)** to be parallel to the orientation of the first linear element **964** as shown in FIG. 15(a).

[0209] As shown in FIG. 15(c), when the movable engagement element **964(a)** is perpendicular to the first linear element **964(a)**, the movable engagement element **964(a)** is engaged with the lock interface member **610** and the locking head **960** is secured to the lock interface member **610**.

[0210] FIG. 16 shows another locking head embodiment according to an embodiment of the invention. The locking head **970** comprises a first part **970(a)** and a second part **970(b)** that is cooperatively configured to the first part **970(a)**. The first part **970(a)** includes a first base portion **970(a)-1** and the second part includes a second base portion **970(b)-1**. The first and/or second base portions **970(a)-1**, **970(b)-1** can form a base and can have radially extending stabilizing elements. An engagement portion **970(b)-2** is part of the second part **970(b)** and extends axially from the second base portion **970(b)-1**.

[0211] When it is used, the engagement portion **970(b)-2** can be inserted past internal protrusions in a lock interface member (not shown). After it is in a locked configuration, the first part **970(a)** with the first base portion **970(a)-1** can mate with the second part **970(b)**, and the first base portion **970(a)-1** can be inserted into the lock interface member. Then, as shown in FIG. 16, a cable **972** can thread through an aperture **976** in the locking head **970**.

[0212] FIG. 17(a) shows another locking head embodiment according to another embodiment of the invention. FIG. 17(a) shows a locking head **980** comprising a base **982** including radially extending stabilizing elements **982(a)**. A stabilizing element **984** including apertures **984(a)** extends from the base **982**.

[0213] As shown in FIG. 17(b), engagement elements **986** can extend outward from the stabilizing element **984** at different points along the stabilizing element **984**. As shown in FIG. 17(c), when the locking head **980** is in a locked configuration, the engagement elements **986** engage the internal protrusions in the lock interface member **610**.

[0214] FIG. 18(a) shows another locking head embodiment according to another embodiment of the invention. FIG. 18(a) shows a locking head **990** comprising a base **992** and an engagement element **994** extending from the base **992**. The engagement element **994** includes a linear portion **994(b)** and an engagement portion **994(a)**.

[0215] As shown in FIG. 18(b), to engage the lock interface member **610**, the engagement portion **994(a)** contacts an inner wall of the lock interface member **610**, and a stabilizing element **996** is inserted into the aperture in the lock interface member **610** to fill any remaining space. FIG. 18(c) shows that the stabilizing element **996** may have a groove which receives the linear portion **994(b)** of the engagement element **994**.

[0216] FIG. 19(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1000** includes a base **1002** and an engagement element **1004** extending from the base **1002**. The engagement element **1002** includes first and second lateral wings **1004(a)**, **1004(b)** at a distal end of the engagement element **1002**.

[0217] As shown in FIG. 19(b), a first stabilizing element **1006**, and base stabilizing elements **1007** can stabilize the locking head within a lock interface member **610** when the locking head **1000** is in a locked configuration.

[0218] As shown in FIG. 19(c), after the engagement element **1004** is inserted into the lock interface member **610** and after the wings **1004(a)**, **1004(b)** are inserted past the protrusions in the lock interface member **610**, it is rotated slightly so that wings **1004(a)**, **1004(b)** overlap with the internal protrusions of the lock interface member **610**. Then, the stabilizing element **1006** is inserted into the aperture in the lock interface member **610**.

[0219] FIG. 20(a) shows another locking head embodiment according to another embodiment of the invention. FIG. 20(a) shows a locking head **1010** including a base **1012** including radially extending stabilizing elements **1012(a)**. An engagement element **1014** including a linear portion **1014(a)** and an engagement portion **1014(b)** extends from the base **1012**. A movable stabilizing element **1016** also extends from the base **1012**.

Ex. 1002 - Page 681 of 997

[0220] FIG. 20(b) shows the locking head **1010** in an unlocked configuration. FIG. 20(b) shows the locking head **1010** in a locked configuration. As shown in FIG. 20(c), the engagement element **1014** engages the inner wall of the lock interface member **610**, while the stabilizing element **1016** fills the remaining space in the aperture in the lock interface member **610**.

[0221] FIG. 21(a) shows another locking head embodiment according to another embodiment of the invention. FIG. 20(a) shows a locking head **1020** including a base **1022** including radially extending stabilizing elements **1022(a)**. An engagement element **1024** including a linear portion **1024(a)** and an engagement portion **1024(b)** in the form of a "T" extends from the base **1022**. A movable stabilizing element **1026** also extends from the base **1012**.

[0222] FIG. 21(a) shows the locking head **1020** in an unlocked configuration. FIG. 21(b) shows the locking head **1020** in a locked configuration. As shown, the stabilizing element **1026** can move in an axial direction towards the engagement element **1024**, and may include a groove **1026(a)** which can receive the linear portion **1024(a)** of the engagement element **1024**.

[0223] As shown in FIG. 21(c), the engagement portion **1024(b)** of the engagement element **1024** can be inserted into the lock interface member **610**, past protrusions in the lock interface member **610**. The engagement portion **1024(b)** can then be moved so that it overlaps with the protrusions in the lock interface member **610**. Then, as shown in FIG. 21(d), the stabilizing element **1026** fills space in the aperture in the lock interface member **610** to secure the locking head **1020** to the lock interface member **610**.

[0224] FIG. 22(a) shows a locking head embodiment according to another embodiment of the invention. FIG. 22(a) shows a stationary engagement element **1030** including a linear portion **1032(b)** and an engagement portion **1032(a)**. As shown in both FIGS. 22(a) and 22(b), a linear stabilizing element **1034** with a trough can actuate in an axial direction.

[0225] FIG. 22(c) shows the locking head embodiment when the locking head is in a locked configuration within a lock interface member **610**. As shown, the engagement portion **1032(a)** lies over a protrusion while the stabilizing element **1034** stabilizes the locking head **1030** and secures it to the lock interface member **610**.

[0226] FIG. 23(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1040** includes three engagement elements **1042(a)**, each including a groove **1042(a)** at a different axial location. The grooves **1042(a)** may be configured to receive protrusions in a lock interface member, when the three engagement elements **1042(a)** extend in a radially outward direction as shown in FIG. 23(b). As shown in FIG. 23(c), a stabilizing element **1046** may actuate in a forward axial direction to cause the engagement elements **1042** to move away from each other.

[0227] FIG. 24(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1050** comprises a base **1058**, and a plurality of engagement elements **1054** coupled to the base **1058** via small hinges. As shown in FIG. 24(b), a stabilizing element **1056** may move in a forward axial direction and may consequently push the engagement elements **1054** outward to engage protrusions in a lock interface member. FIG. 24(c) shows a perspective view of the locking head **1050** when it is in a locked configuration.

[0228] FIG. 25(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1060** comprises a base **1062** including radially extending stabilizing elements **1062(a)**, and a plurality of engagement elements **1064** coupled to the base **1062** via small hinges **1066**. As shown in FIGS. 25(b) and 25(c), a stabilizing element **1066** may move in an axial direction upward and may consequently push the engagement elements **1064** outward to engage protrusions in a lock interface member.

[0229] FIG. 26(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1070** comprises a base **1076**, and a compressible element **1072** comprising an elastomeric material coupled to the base **1076**. The elastomeric material **1072** has a central hole, and a movable stabilizing element **1074** can move in an axial direction within the hole. As shown in FIG. 26(b), when the moving stabilizing element **1074** fills the hole in the compressible element **1072**, the compressible element **1072** is pushed radially outward so that it engages the protrusions of the lock interface member **610**. In this example, the compressible element **1072** may be an example of an engagement element. FIG. 26(c) shows a perspective view of the locking head **1070**.

[0230] FIG. 27(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1080** includes a base **1082** including stabilizing elements **1082(a)** that extend radially outward. The locking head **1080** also

includes a compressible element **1086** that is between a movable structure **1084(a)** and an end structure **1084**. In this example, the compressible element **1086** may be an example of an engagement element.

[0231] The locking head **1080** is in an unlocked configuration in FIG. 27(a) and the compressible element **1086** is uncompressed. In FIGS. 27(b) and 27(c), the locking head **1080** is in a locked configuration. The compressible element **1086** compresses in response to the linear movement of the movable structure **1082**. The end structure **1084** remains stationary. As shown in FIG. 27(c), when the compressible element **1086** is compressed, it extends radially outward and engages the inner walls of the lock interface member **610**.

[0232] FIG. 28(a) shows another locking head embodiment according to another embodiment of the invention. FIG. 28(a) shows a hollow body **1092** including a number of radially extending flanges **1092(a)**, and holes **1092(b)** at a distal end. Referring to FIGS. 28(a), 28(b), and 28(c), a linear movable structure **1094** moves within the hollow body **1092** and can push balls **1096** or other structures radially outward to engage protrusions in a lock interface member (not shown).

[0233] FIG. 29(a) shows another locking head embodiment according to another embodiment of the invention. FIG. 29(a) shows a locking head **1100** including a base **1108** and three hollow, arc-shaped pillar structures **1102** including holes on the sides thereof. As shown in FIGS. 29(a), 29(b) and 29(c), balls **1104** may be present at lateral ends of the arc-shaped pillar structures **1102** and may extend outward from the respective pillar structures **1102** when a linear movable structure **1106** within each pillar structure **1112** can moves toward the balls **1104**. The outwardly extended balls **1104** can prevent the locking head **1110** from being withdrawn from a lock interface member. As in prior embodiments, the base **1108** may have radially extending stabilizing elements (not shown in FIG. 29(a)).

[0234] FIG. 30(a) shows another locking head embodiment according to another embodiment of the invention. FIG. 30(a) shows a locking head including a body **1111** with a first part **1110(a)** and a second part **1110(b)**. The second part **1110(b)** has a larger diameter than the first part **1110(a)**. The first part has engagement elements **1110(a)-1** including different axial lengths. As shown in FIGS. 30(a) and 30(b), stabilizing elements **1112** can be inserted into portions **1111** of an aperture in a lock interface member **610** and alongside the second part **1110(b)** to stabilize the locking head **1110** with respect to the lock interface member **610**.

[0235] FIG. 31(a) shows another locking head embodiment. FIG. 31(a) shows a locking head **1120** including a cylindrically-shaped base **1120(a)** including axially extending stabilizing elements **1120(a)-1**. An engagement element **1120(b)** with a linear portion **1120(b)-1** and axially extending engagement portions **1120(b)-1** of different lengths, can move axially within the cylindrically-shaped base **1120(b)**. The engagement portions **1120(b)-1** can engage the protrusions in the previously described lock interface members. After the engagement portions **1120(b)-1** engage the protrusions in the lock interface member, the stabilizing elements **1120(a)-1** can be inserted into the lock interface member to secure the head **1120** to the lock interface member.

[0236] FIGS. 32(a)-32(c) show a locking head embodiment that is somewhat similar to the locking head embodiment shown in FIGS. 31(a)-31(c). The locking head in FIG. 32(a) additionally shows an actuating button **1121**. In an embodiment of the invention, the actuating button **1121** can depress when a user pushes the locking head against a lock interface member. This, in turn, can cause the engagement element **1120(b)** to move forward as shown in FIG. 32(b) or cause the outer cylindrically-shaped base **1120(b)** to move forward as shown in FIG. 32(c). Thus, when the locking head is placed in the lock interface member at the correct depth, the small button **1121** (or plunger or the spindle itself) pushed in. This action also comprises a spring, and the lock automatically moves into the locked position. A turn of the key unlocks the device and resets the spring. In this embodiment, the actuation of the locking head elements can be automatic.

[0237] FIG. 33(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1130** includes a cylindrically-shaped base **1132** including axially extending stabilizing elements **1134**. An engagement element **1136** with a linear portion **1136(a)** and an engagement element **1136(b)** can move axially within the cylindrically-shaped base **1132**. An additional stabilizing element **1138** can move within the cylindrically-shaped base **1132**. As shown FIG. 33(c), the engagement portion **1136(b)** can lie over a protrusion in the lock interface member **610** when the lock interface member **610** is engaged to the locking head **1130**. The stabilizing element **1138** can additionally reside between two adjacent internal protrusions in the lock interface member **610**.

[0238] FIG. 34(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1140** includes a cylindrically-shaped base **1142** including axially extending stabilizing elements **1144**. An engagement element **1144**

with a linear portion **1145** and movable engagement portions **1146** can extend from the base **1142**. As shown in FIGS. 34(b)-34(c), the movable engagement portions **1146** can be biased radially outward using springs **1149**. Moveable linear structures **1148** can be in the linear portion **1145** and can prevent the movable engagement portions **1146** from being pushed radially inward when the locking head **1130** is in a locked configuration.

[0239] FIG. 35(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1150** includes a cylindrically-shaped base **1151** including axially extending stabilizing elements **1151(a)**. An engagement element **1152** with a linear portion **1152(a)** and movable engagement portions **1152(b)** can extend from the base **1151**. As shown in FIG. 35(b), the movable engagement portions **1152(b)** can extend radially outward when the locking head **1150** is in a locked configuration.

[0240] As shown in FIG. 35(a), when it is in an unlocked configuration, the engagement elements **1152(b)** are flush with the linear portion **1152(a)**. Once placed into the lock interface member, the user pushes a button (as shown in FIG. 35(c)) or turns a knob (as shown in FIG. 36(d)) to change the locking head **1150** from a locked configuration to an unlocked configuration. The engagement elements **1152(b)** then rotate into place, and are secured to the lock interface member.

[0241] FIG. 36(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1160** includes a cylindrically-shaped base **1162** including axially extending stabilizing elements **1162(a)**. An engagement element **1164** with a linear portion **1164(c)** and movable engagement portions **1164(b)** can extend from the base **1162**. The linear portion **1164(c)** has a triangular radial cross-section. As shown in FIGS. 36(b), the movable engagement portions **1164(b)** can extend radially outward when the locking head **1160** is in a locked configuration. More specifically, as shown in FIG. 36(c), when the linear portion **1164(c)** rotates, it pushes the movable engagement portions **1164(b)** outward so that they lie over protrusions in the lock interface member **610**. The linear portion **1164(c)** may be in the form of a triangular bar that is turned by a locking mechanism. This causes the locking "jaws" to rotate into place, preventing its removal from a lock interface member.

[0242] FIG. 37(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1170** includes a cylindrically-shaped base **1172** including axially extending stabilizing elements **1172(a)**. An engagement element **1174**

with a linear portion **1174(b)** and movable, curved, engagement portions **1164(a)** can extend from the base **1172**. The movable engagement portions **1174(a)** are curved. The linear portion **1174(b)** has curved sides and has a cylindrical shape. As shown in FIG. 37(b), the movable engagement portions **1174(a)** can extend in a generally axial direction when the locking head **1170** is in a locked configuration. As shown in FIG. 37(a), when unlocked, the engagement portions **1174(a)** are flush with the end of the linear portion **1174(b)**. Once placed into the lock interface member, the lock mechanism could push the engagement portions **1174(a)** out via rods or using a high-angle helix to twist them out (see FIGS. 37(c) and 37(d)).

[0243] FIG. 38(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1180** includes a cylindrically-shaped base **1182** including axially extending stabilizing elements **1182(a)**. An engagement element **1184** with a linear portion **1184(b)** and movable engagement portions **1184(a)** can extend from the base **1182**. The movable engagement portions **1184(a)** have inner grooves that can receive the linear portion **1184(b)**. The linear portion **1184(b)** has an elongated radial cross-section. As shown in FIG. 38(b), the movable engagement portions **1184(a)** can move radially outward when the locking head **1180** is in a locked configuration. The linear portion **1184(b)** can be twisted by a lock mechanism, causing the two locking "jaws" of the movable engagement portions **1184(a)** to flex or hinge into place as shown in FIGS. 38(c) and 38(d).

[0244] FIG. 39(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1190** includes a cylindrically-shaped base **1192** including axially extending stabilizing elements **1192(a)**. An engagement element **1194** with a linear portion **1194(b)** and movable engagement portions **1194(a)** can extend from the base **1194(b)**. As shown in FIG. 39(b), the movable engagement portions **1194(a)** can be move radially outward. As shown in FIGS. 39(c) and 39(d), a moveable linear structure **1198** can be in the linear portion **1194(b)** and can push the movable engagement portions **1194(a)** outward so that they engage the protrusions of the lock interface member **610**.

[0245] FIG. 40(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1200** includes a cylindrically-shaped base **1202** including axially extending stabilizing elements **1204**. An engagement element **1208** in the form of plate is attached to a linear portion **1206** via a smaller linear portion **1206(a)** and a hinge **1206(b)**. A second movable linear portion **1209** is attached to the engagement

element **1208** and can move axially within the linear portion **1206** to cause the engagement element **1208** to be positioned perpendicular to (in a locked configuration) or parallel to (in an unlocked configuration) the linear portion **1209**. Thus, in this embodiment, an engagement element **1208** in the form of a hinged plate or disc slides into the lock interface member. When the locking mechanism is actuated, the engagement element **1208** flips from horizontal to vertical, locking it into position. This is shown in FIGS. 40(c)-40(e).

[0246] FIGS. 41(a) and 41(b) show another locking head embodiment according to another embodiment of the invention. The locking head **1210** includes a cylindrically-shaped base **1212** including axially extending stabilizing elements **1214**. An engagement element **1214** with an engagement portion **1214(a)**, in the form of tiltable structure, is attached to linear portions **1214(b)** via a hinge **1206(b)**. As shown in FIGS. 41(c) and 41(d), the engagement portion **1214(a)** of the engagement element **1214** is flush with the linear portions **1214(b)** when it is in an unlocked configuration. After the structure is placed inside the lock interface member, as shown in FIGS. 41(c) and 41(d), the lock mechanism drives a rod **1219** forward, locking the engagement element **1214** in place.

[0247] FIG. 42(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1220** includes a cylindrically-shaped base **1222** including axially extending stabilizing elements **1222(a)**. An engagement element **1224** with a linear portion **1224(b)** and movable engagement portions **1224(a)** can extend from the base **1222**. As shown in FIG. 42(b), the movable engagement portions **1224(a)** can move radially outward. As shown in FIG. 42(b), a linear portion **1224(b)** and can push the movable engagement portions **1224(a)** outward so that they engage the protrusions of a lock interface member. The linear portion **1224(b)** can have a flared end that is pulled back by a lock mechanism (e.g., as shown in FIG. 42(c). The flared end forces the three engagement portions **1224(b)** apart preventing removal of the locking head **1220** from a lock interface member.

[0248] FIG. 43(a) shows another locking head embodiment according to another embodiment of the invention. The locking head **1230** includes a cylindrically-shaped base **1232** including axially extending stabilizing elements **1232(a)**. An engagement element **1234** with a movable engagement portion **1234(a)**, and linear portions **1234(b)**, can extend from the base **1232**. As shown in FIG. 43(b), the movable engagement portions **1234(a)** can move radially outward. As shown in FIG. 43(b), linear portions **1234(b)** and can push the movable

engagement portion **1234(a)** outward so that it engages the protrusions of a lock interface member. When placed inside of a lock interface member, the linear portions **1234(b)** are actuated. This distorts the engagement portion **1234(b)** which may be in the form of a cylindrical leaf spring. and prevents the locking head **1230** from being removed from a lock interface member.

[0249] FIGS. 44(a)-44(b) show another locking head embodiment according to another embodiment of the invention. The locking head **1240** includes a cylindrically-shaped base **1242** including axially extending stabilizing elements **1242(a)**. An engagement element **1244** with a linear portion **1244(b)** and movable engagement portions **1244(a)** can extend from the base **1242**. As shown in FIG. 44(b), the movable engagement portions **1244(a)** can move radially outward. Pins **1245** may couple the linear portion **1244(b)** to the engagement portions **1244(a)** and may move linearly within tracks **1247** in the linear portion **1244(b)**. This embodiment is a variation on the embodiment in FIGS. 44(a) and 44(b). In this embodiment, once the locking head portions are placed inside the lock interface member, the locking mechanism drives two pins **1245** forward, causing the movable engagement portions **1244(a)**, which may be a leaf spring, to distort and locking it in place. FIGS. 44(c)-44(d) show the movement of the leaf spring between locked and unlocked configurations.

[0250] FIGS. 45(a)-45(b) show another locking head embodiment according to another embodiment of the invention. The locking head **1250** includes a cylindrically-shaped base **1252** including axially extending stabilizing elements **1252(a)**. An engagement element **1254** with a cylindrically shaped linear portion **1254(b)** and movable engagement portions **1254(a)** can extend from the base **1252**. As shown in FIG. 45(b), the movable engagement portions **1254(a)** can move radially outward to engage protrusions in a lock interface member **610** as shown in FIGS. 45(c) and 45(d). This embodiment can be considered a "triple leaf spring embodiment. When the locking head **1250** is in an unlocked configuration, three engagement portions **1254(b)** in the form of three leaf springs with a "memorized" shape are inside the linear portion **1254(b)**. Once in place in the linear portion **1254(b)**, a lock mechanism pushes the engagement portions **1254(b)** out, they return to their original shape, and the locking head **1250** cannot be separated from the lock interface member **610**.

[0251] **I. Examples**

[0252] Three different types of locking systems were produced for testing. The engagement elements include a Type A system which resembled T-bars like those described

in U.S. Patent No. 5,502,989, a Type B system which resembled the mechanism shown in FIGS. 2(b) and 2(d) in the present application, and a Type C system which resembled the mechanism shown in FIGS. 4(a)-4(c) in the present application.

[0253] A. Test Description

[0254] A test rig was used to apply the pull force to the systems. A multi-meter was used to measure the force a load sensor from 0-3000 lbs. The basic rig was used to pull on all three locking mechanisms. As each mechanism was a different shape, each locking mechanism required a slightly different fixture to hold the unit in place for the pull test.

[0255] The objective of each test fixture was to lock the mechanism into place and pull axially along the shaft of the T-bar or other type of engagement element, and 90 degrees to the engagement surface.

[0256] Type A system including a T-bar: An engagement plate with a conventional 3 x 7 mm^2 slot was affixed to a test rig with C clamps. The Type A T-bar test fixture was locked into place and pulled using a flat clamp to hold the top of the locking mechanism. The T-bar and engagement plate were made of stainless steel.

[0257] Type B system: An engagement plate with a configuration like the lock interface member in FIG. 2(b) was affixed to the test rig with C clamps. The Type B system was locked into place and pulled using a radial clamp to hold the top of the locking mechanism. All parts were made of stainless steel.

[0258] Type C system: An engagement plate with a configuration like the lock interface member shown in FIGS. 4(a)-4(c) included two parts including the actual engagement surface and a plate with C clamps, which held the engagement surface to the rig. As the Type C system did not have enough surface area to grip with a clamp, the Type C system was locked into place and was pulled using a flat steel metal piece with a hole in it for the shaft. All parts were made of stainless steel.

[0259] Six Type A T-bar samples, and five Type B and five Type C samples were tested. Each locking mechanism was attached to its corresponding fixture and pulled until a failure was noticed. The force of the pull was recorded by the multi-meter as a voltage. Then after the recording, the pound force required to cause the failure was calculated.

[0260] **B. Test Results**

[0261] Test results for the Type A system are provided below.

Type A T-bar Sample No.	Pull force to failure	Type of failure
1	1273.5 lbs	Unit bent
2	1219.7 lbs	Unit broke
3	699.5 lbs	Unit broke
4	1215.2 lbs	Unit broke
5	1210.7 lbs	Unit broke
6	1174.8 lbs	Unit broke

[0262] Test results for the Type B system are provided below.

Type B Sample No.	Pull force to failure	Type of failure
1	1520.1 lbs	Deformed
2	1937.2 lbs	Deformed and broke (It was not clear whether the other units broke or only deformed as broken pieces may have been missed as they were so small)
3	1488.7	Deformed
4	1668.1	Deformed
5	1937.2	Deformed

[0263] Test results for the Type C system are provided below.

Type C Sample No.	Pull force to failure (lbs)	Type of failure
1	1757.8	Unit broke
2	1753.3	Unit broke
3	1793.7	Unit broke
4	1623.3	Unit broke
5	1668.1	Unit broke

[0264] The Type A T-Bar failure range was from 699.5 to 1273.5 with an average of 1132.2. The Type B failure range was from 1448.7 to 1937.2 with an average of 1710.3. The

Type C failure range was from 1623.3 to 1793.7 with an average of 1719.2. Based on the averages as well as the 5 data points, the Type B and Type C embodiments required greater pound force to failure than the Type A T-bar embodiment. On average, the Type C embodiment and the Type B embodiment experienced approximately 50% more pound force to failure than the Type A T-bar embodiment.

[0265] The above description is illustrative and is not restrictive. Many variations of the invention will become apparent to those skilled in the art upon review of the disclosure. The scope of the invention should, therefore, be determined not with reference to the above description, but instead should be determined with reference to the pending claims along with their full scope or equivalents.

[0266] One or more features from any embodiment may be combined with one or more features of any other embodiment without departing from the scope of the invention.

[0267] A recitation of "a", "an" or "the" is intended to mean "one or more" unless specifically indicated to the contrary.

WHAT IS CLAIMED IS:

1. A system comprising:

a portable electronic device comprising a lock interface member having an aperture and a protrusion; and

a security apparatus comprising a head comprising an engagement element adapted to engage the lock interface member via the aperture and the protrusion, and being cooperatively structured with the protrusion, and a stabilizing element capable of being inserted into the lock interface member to prevent the engagement element from being removed from the aperture.

2. The system of claim 1 wherein the engagement element comprises a plurality of lobes, wherein the lobes within the plurality of lobes have different axial lengths.

3. The system of claim 1 wherein the protrusion is one of a plurality of protrusions, wherein the protrusions in the plurality of protrusions have different lengths.

4. The system of claim 1 further comprising a cable coupled to the head, and wherein the protrusion is one of a plurality of protrusions in the lock interface member.

5. The system of claim 1 wherein the head further comprises a first stabilizing element and a second stabilizing element, wherein the first stabilizing element and the second stabilizing element are insertable into the lock interface member, and wherein the lock interface member comprises two slots, wherein the two slots are configured to receive the first and second stabilizing elements.

6. The system of claim 1 wherein the head further comprises a stabilizing element, wherein the stabilizing element is insertable into the lock interface member.

7. The system of claim 1 wherein the protrusion comprises a first sloped surface, and wherein the engagement element comprises a lobe, wherein the lobe comprises a second sloped surface, wherein the first and second sloped surfaces face each other when the engagement element engages the lock interface member.

8. The system of claim 1 wherein the lock interface member comprises at least three protrusions, and wherein the engagement element comprises at least three lobes, wherein the at least three protrusions engage the at least three lobes when the lock interface member engages the engagement element.

9. The system of claim 1 wherein the head comprises a locking mechanism.

10. A method for securing a security apparatus, the security apparatus for use with a lock interface member having an aperture and a protrusion, the security apparatus comprising a head comprising an engagement element adapted to engage the lock interface member via the aperture and the protrusion, and being configured to engage the lock interface member, and a stabilizing element capable of being inserted into the lock interface member to prevent the engagement element from being removed from the aperture, and a security device attached to the head, the method comprising:

(a) inserting the engagement element into the aperture;

(b) moving the engagement element so that the engagement element is secured to the lock interface member, and wherein at least a portion of the engagement element engages the protrusion; and

(c) inserting the stabilizing element into the lock interface member.

11. The method of claim 10 wherein (b) is performed before (c).

12. The method of claim 10 wherein (a)-(c) are performed in order.

13. The method of claim 10 wherein the lock interface member is associated with a portable electronic device.

14. The method of claim 10 wherein the security device comprises a cable comprising a loop at an end of the cable, wherein the method further comprises:

wrapping the cable around an immovable object;

inserting the head into the loop; and

then performing (a), (b), and (c).

15. The method of claim 10 wherein the portable electronic device is a portable computer, and wherein moving the engagement element comprises rotating the engagement element.

16. The method of claim 10 further comprising:
locking a locking mechanism in the head.

17. The method of claim 10 further comprising locking the locking mechanism in the head using a key.

18. A security apparatus for use with a lock interface member having an aperture and a protrusion, the security apparatus comprising:
a head comprising an engagement element adapted to engage the lock interface member via the aperture and the protrusion, and being configured to engage the lock interface member, and a stabilizing element capable of being inserted into the lock interface member to prevent the engagement element from being removed from the aperture; and
a security device attached to the head.

19. The security apparatus of claim 18 wherein the engagement element comprises two cross-members and a shaft portion between the two cross-members.

20. The security apparatus of claim 19 wherein the protrusion is received between the two cross-members.

21. The security apparatus of claim 18 wherein the head further comprises a housing and at least a portion of the engagement element and the stabilizing element disposed within the housing.

22. The security apparatus of claim 18 wherein the engagement element is capable of moving relative to the housing, but the stabilizing element is not capable of moving relative to the housing.

23. The security apparatus of claim 18 wherein the stabilizing element is capable of moving relative to the housing, but the engagement element is not capable of moving relative to the housing.

24. The security apparatus of claim 18 wherein the head comprises a locking mechanism, wherein the locking mechanism is capable of being in a locked state or an unlocked state.

25. The securing apparatus of claim 18 wherein the engagement element comprises a plurality of lobes, wherein the lobes within the plurality of lobes have different axial lengths.

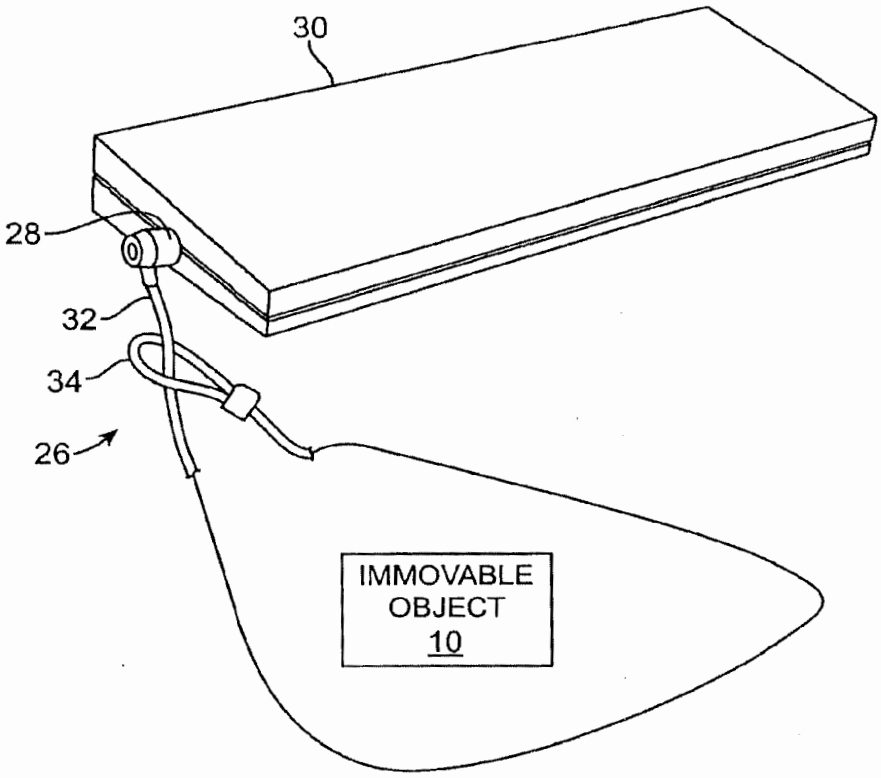


FIG. 1

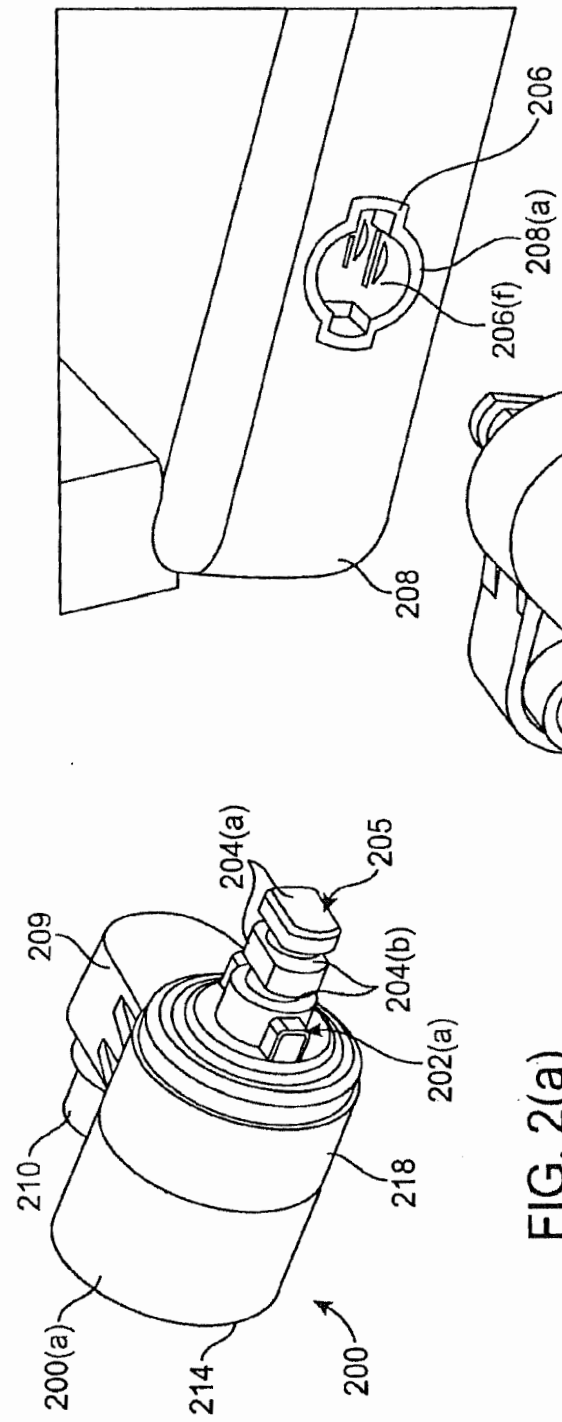

209
204(a)
205
204(b)
202(a)
210
218
200(a)
214
200

FIG. 2(a)

206
208(a)
206(f)
208
200(a)
214
210
200

FIG. 2(b)

Ex. 1002 - Page 699 of 997

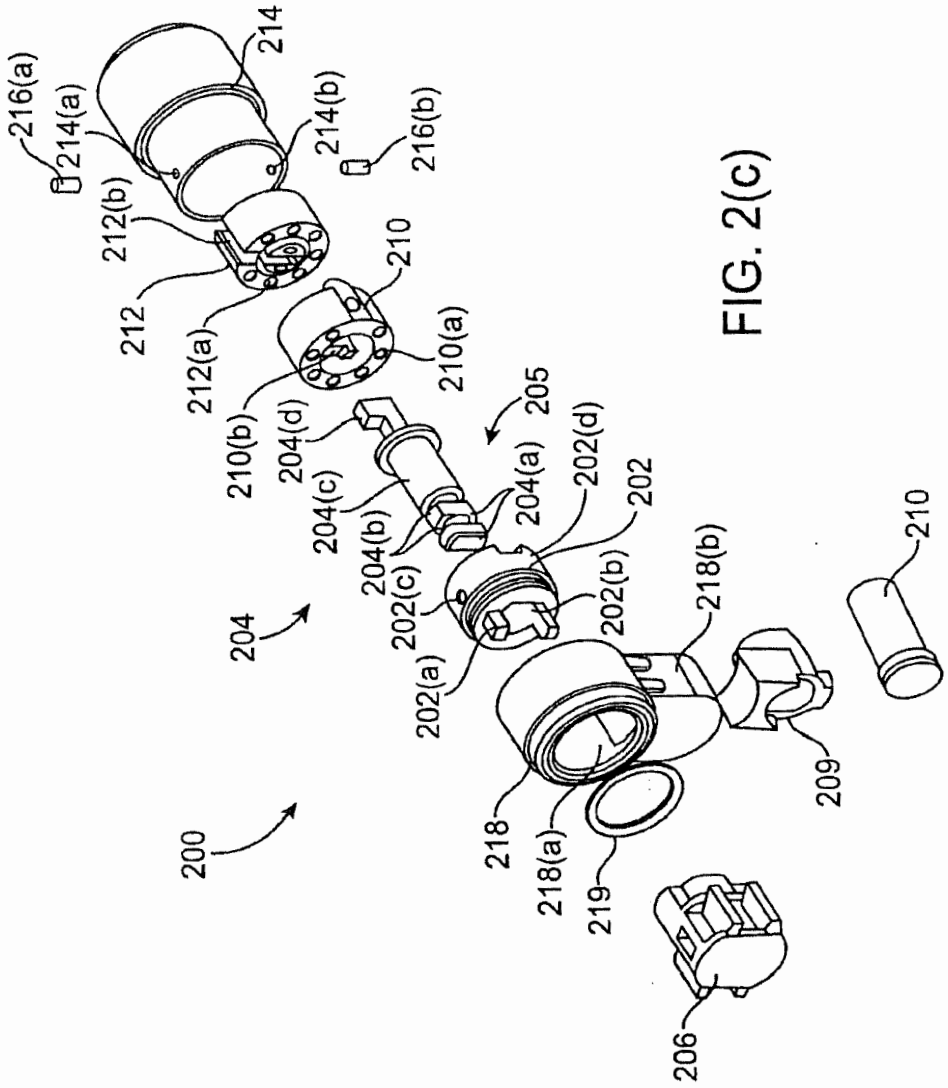


FIG. 2(c)

Ex. 1002 - Page 700 of 997

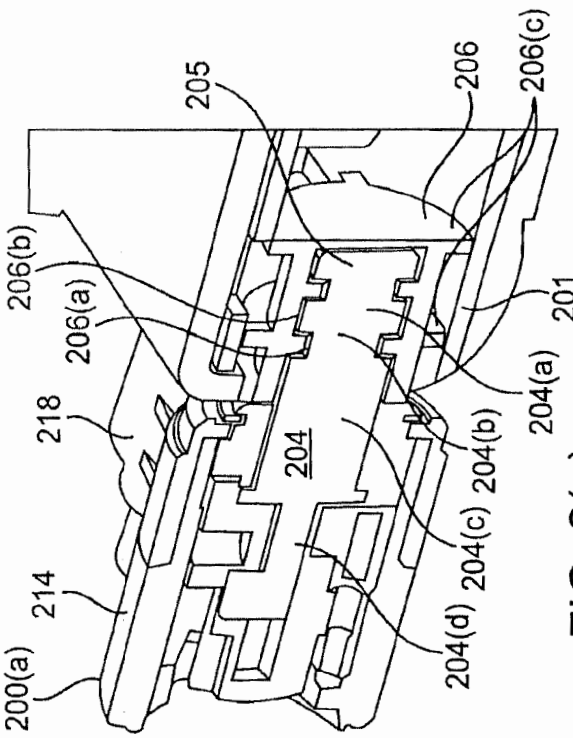


FIG. 2(e)

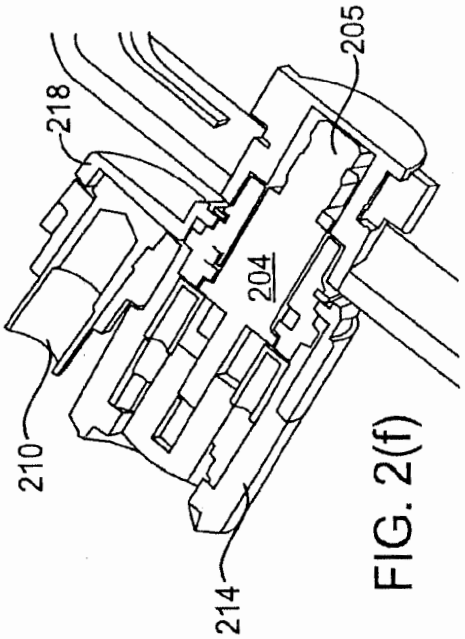


FIG. 2(f)

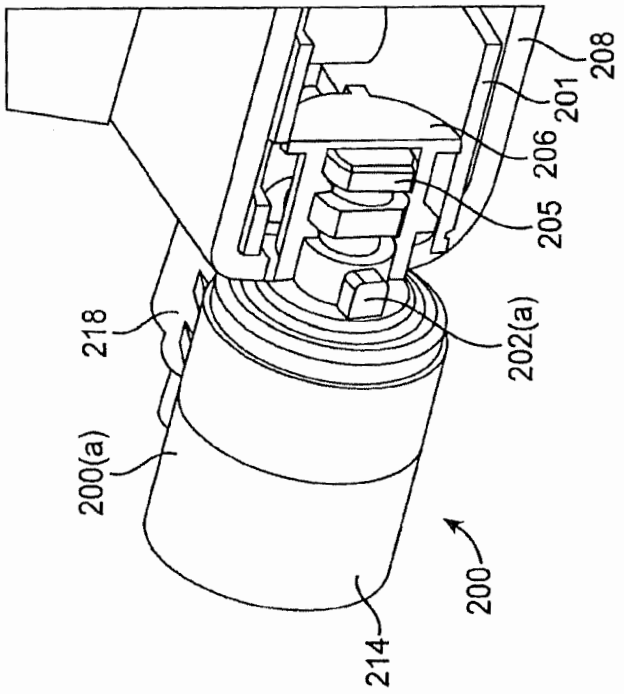


FIG. 2(d)

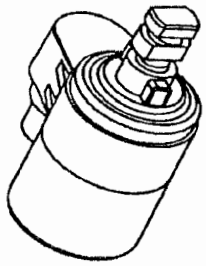


FIG. 2(h)

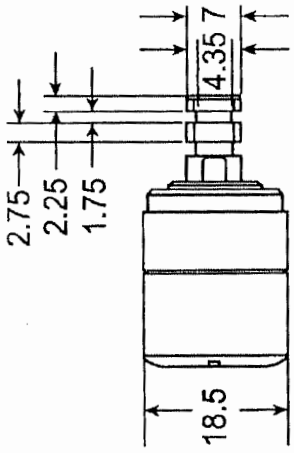


FIG. 2(g)

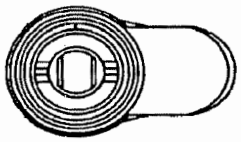


FIG. 2(k)

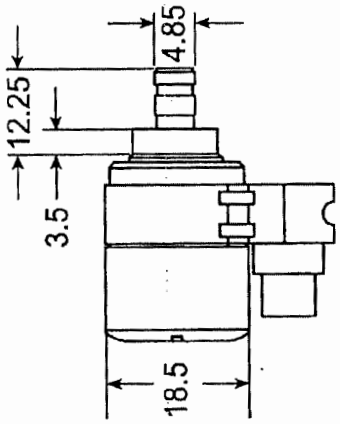


FIG. 2(j)

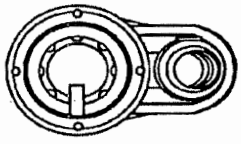


FIG. 2(i)

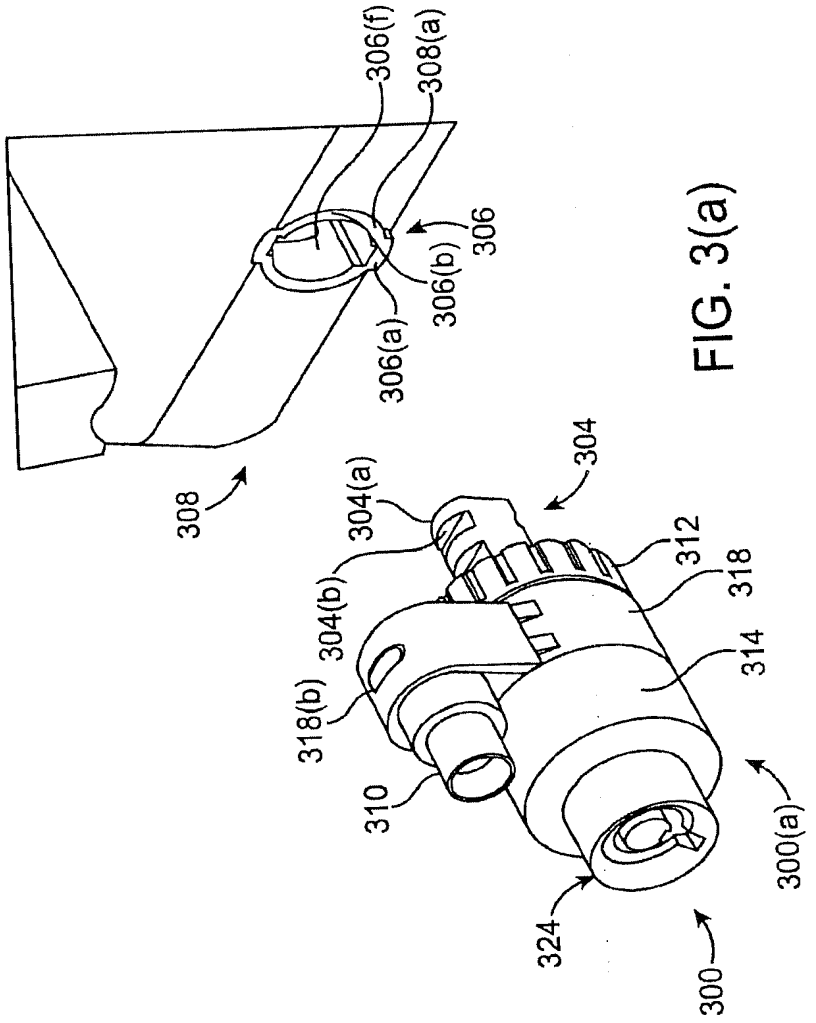

306(f)
308(a)
306
306(b)
306(a)
308
304
304(a)
304(b)
312
318
314
318(b)
310
300(a)
324
300

FIG. 3(a)

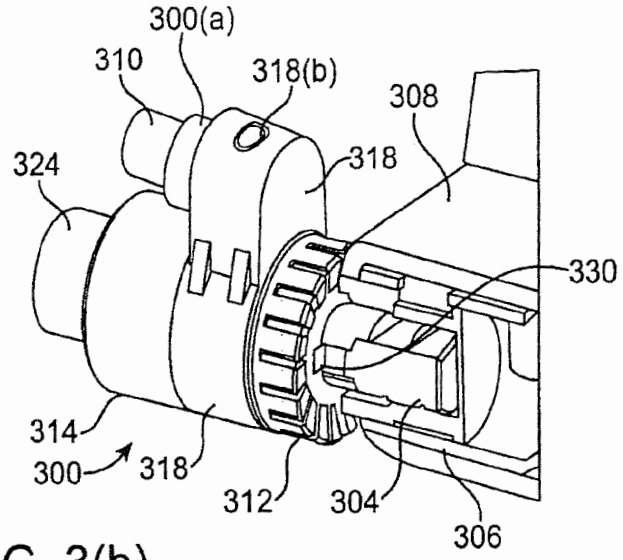


FIG. 3(b)

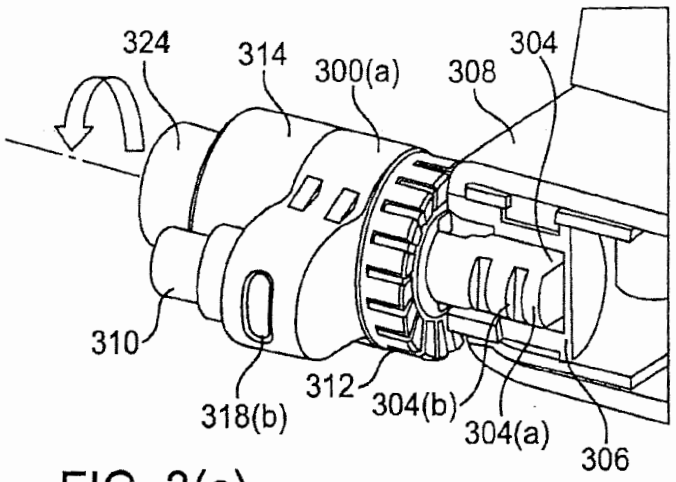


FIG. 3(c)

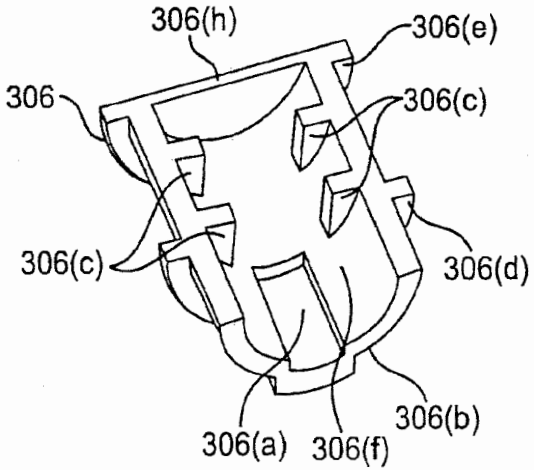


FIG. 3(d)

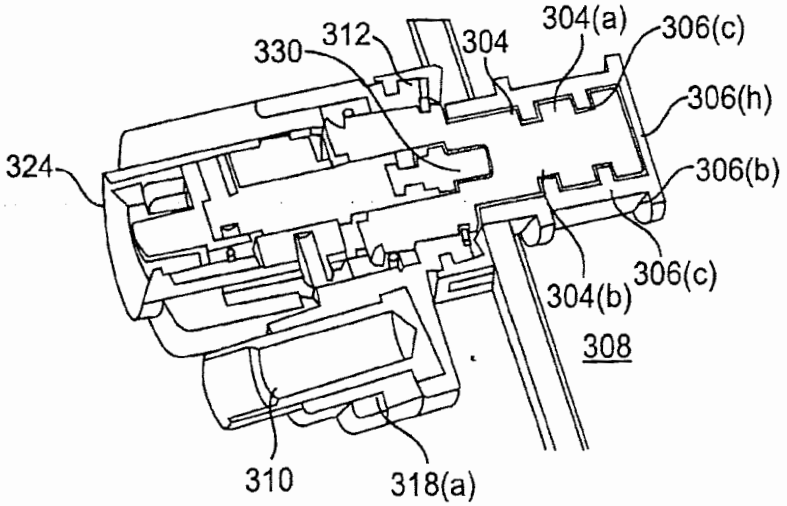


FIG. 3(e)

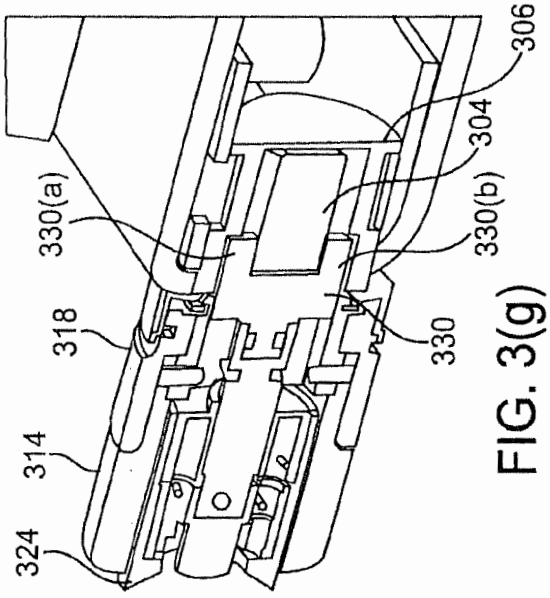


FIG. 3(g)

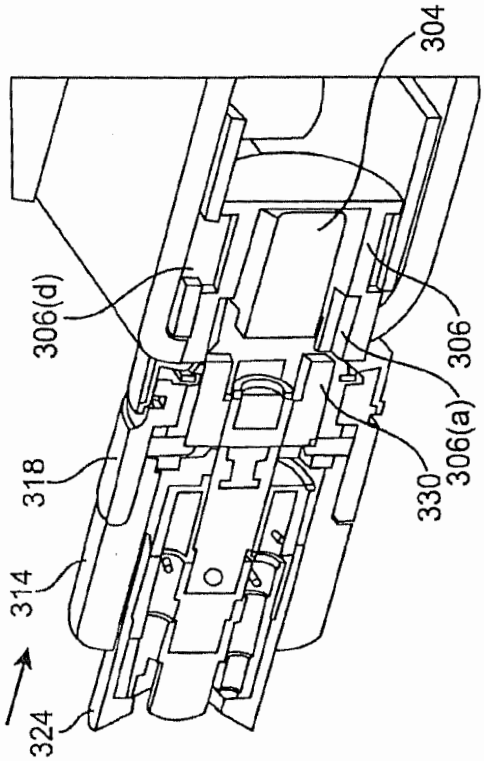


FIG. 3(f)

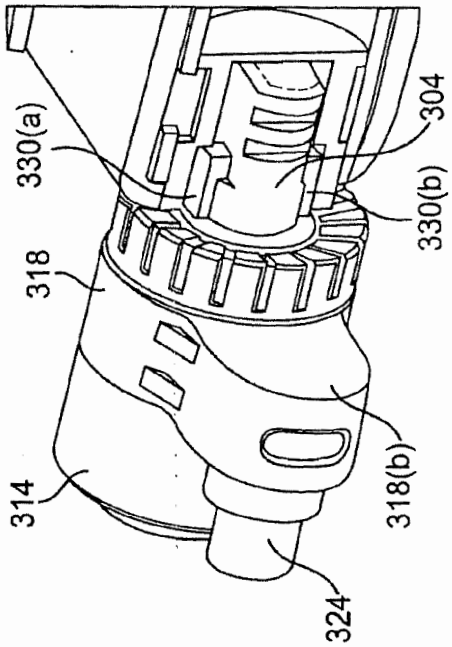


FIG. 3(h)

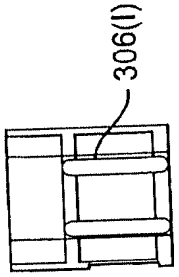


FIG. 3(l)

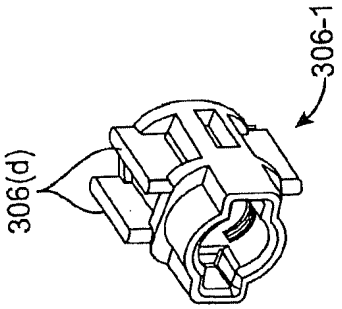


FIG. 3(k)

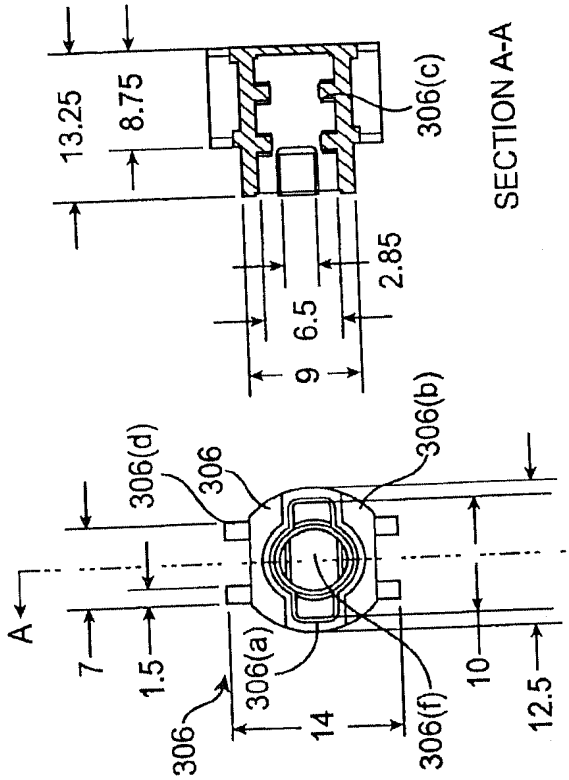


FIG. 3(j)

FIG. 3(i)

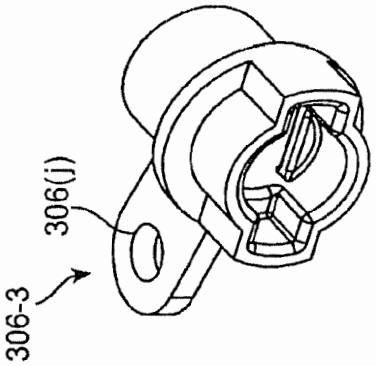


FIG. 3(n)

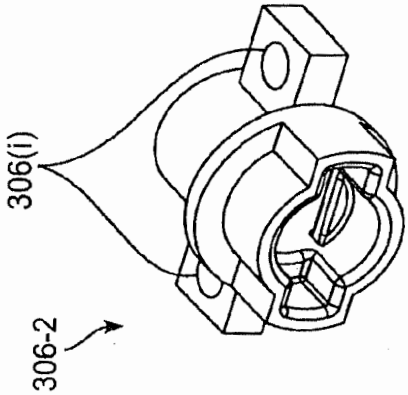


FIG. 3(m)

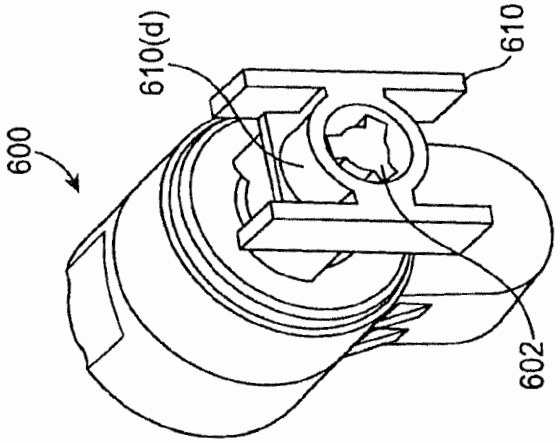


FIG. 4(c)

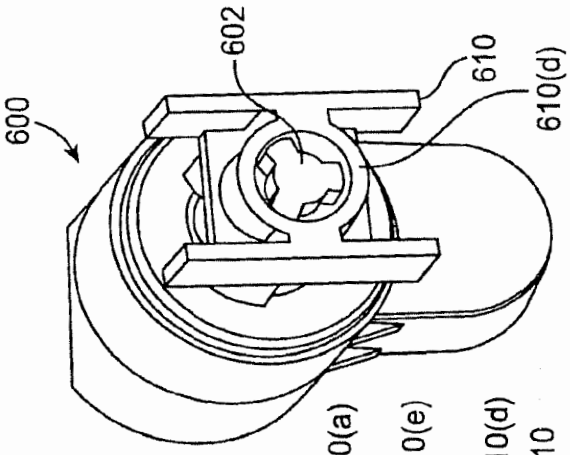


FIG. 4(b)

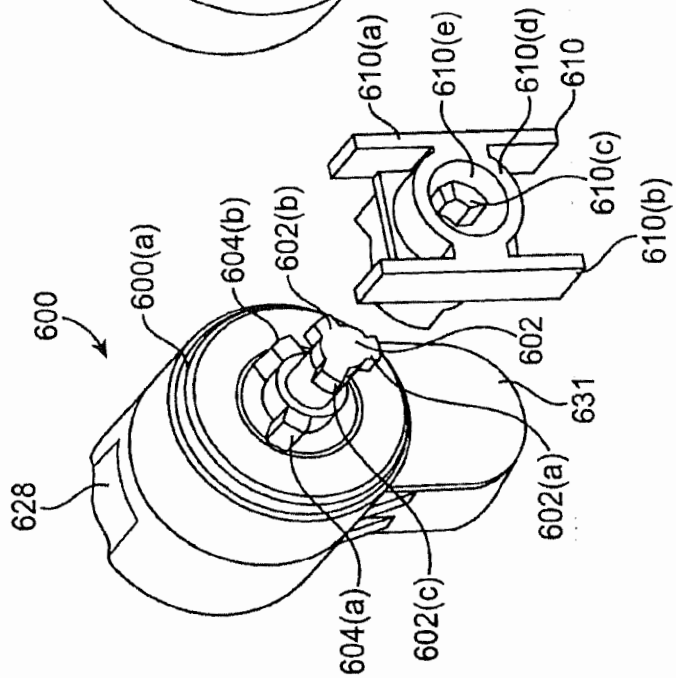


FIG. 4(a)

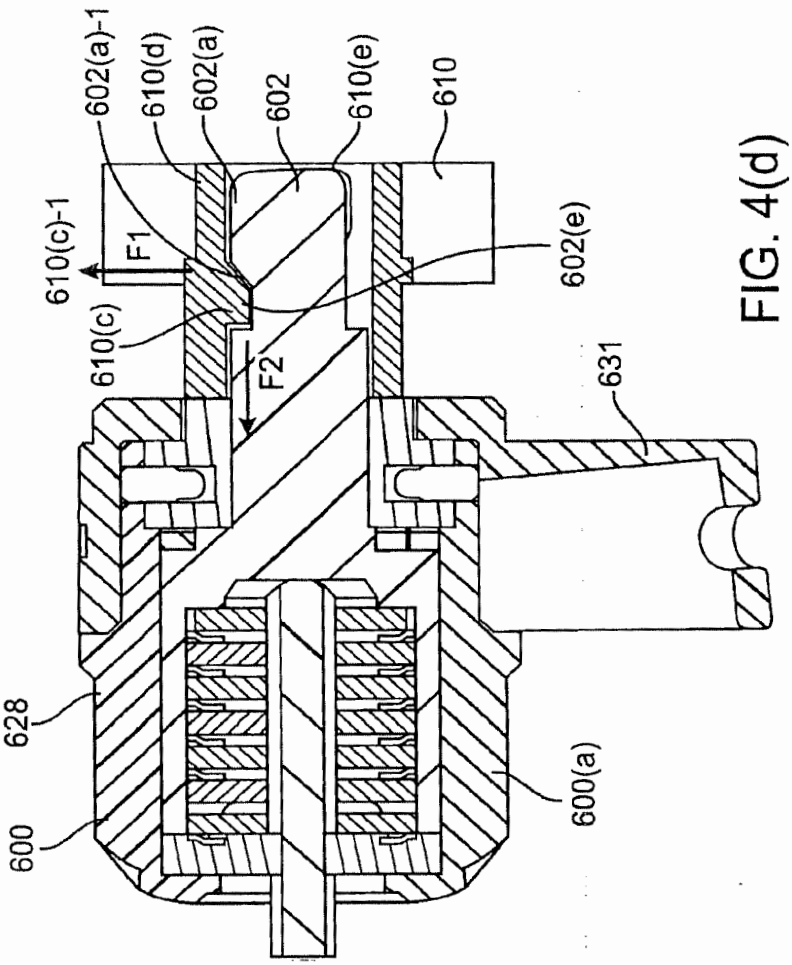

602(a)-1
610(d)
602(a)
602
610(e)
610
610(c)-1
F1
602(e)
610(c)
F2
631
628
600
600(a)

FIG. 4(d)

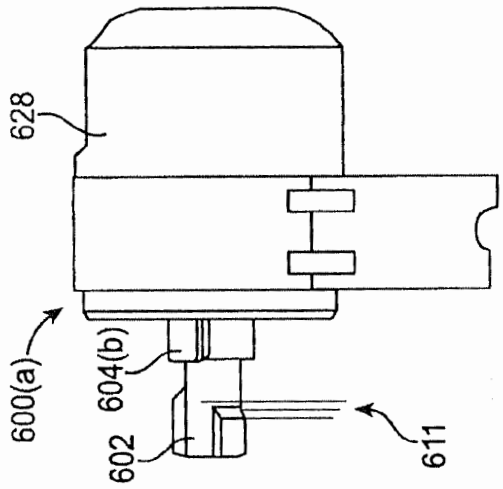


FIG. 5(c)

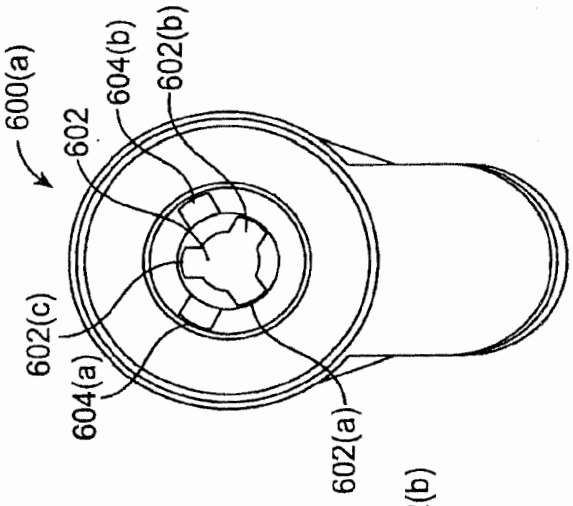


FIG. 5(b)

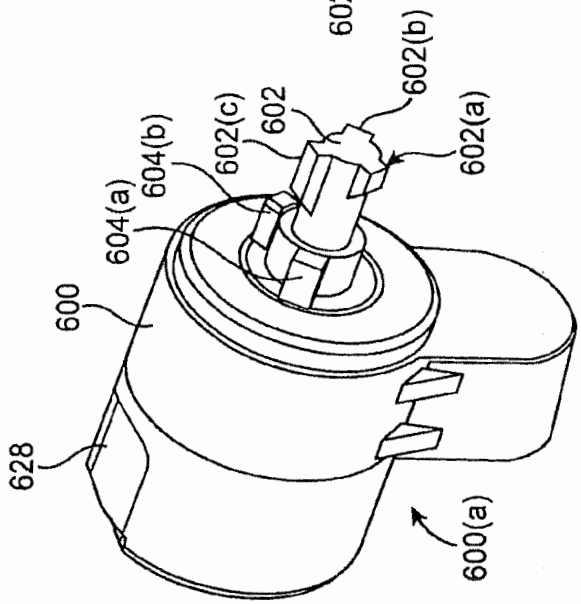


FIG. 5(a)

Ex. 1002 - Page 709 of 997

Ex. 1002 - Page 710 of 997

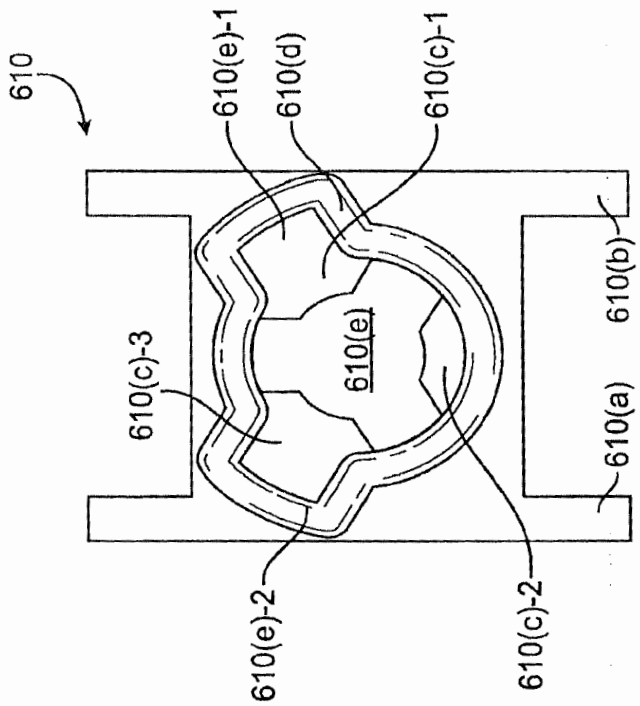


FIG. 6(b)

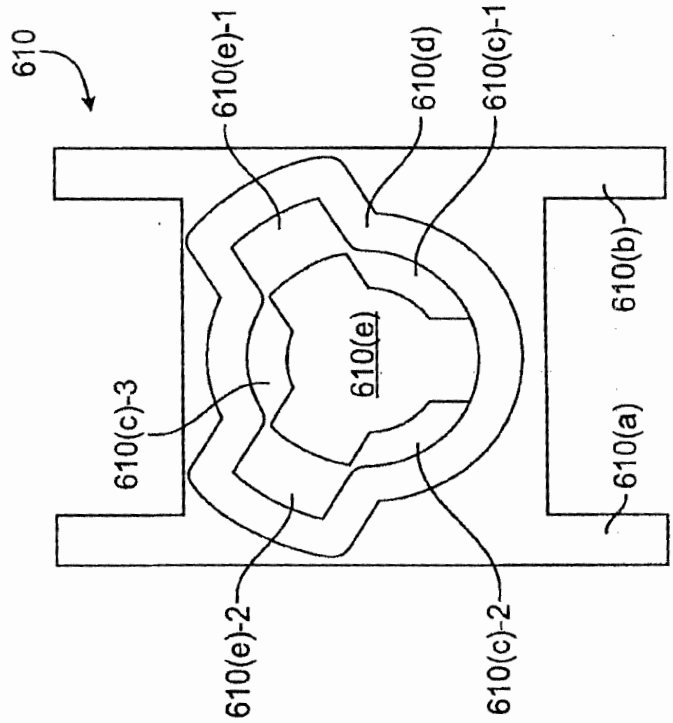


FIG. 6(a)

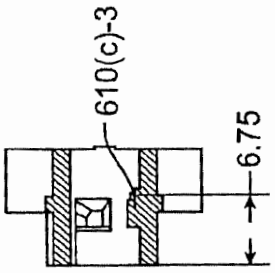


FIG. 7(c)

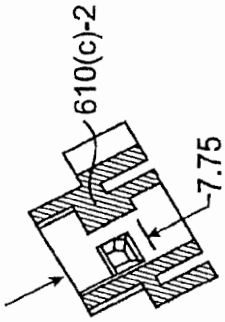


FIG. 7(b)

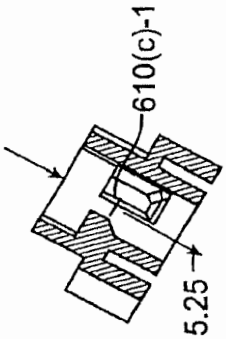


FIG. 7(a)

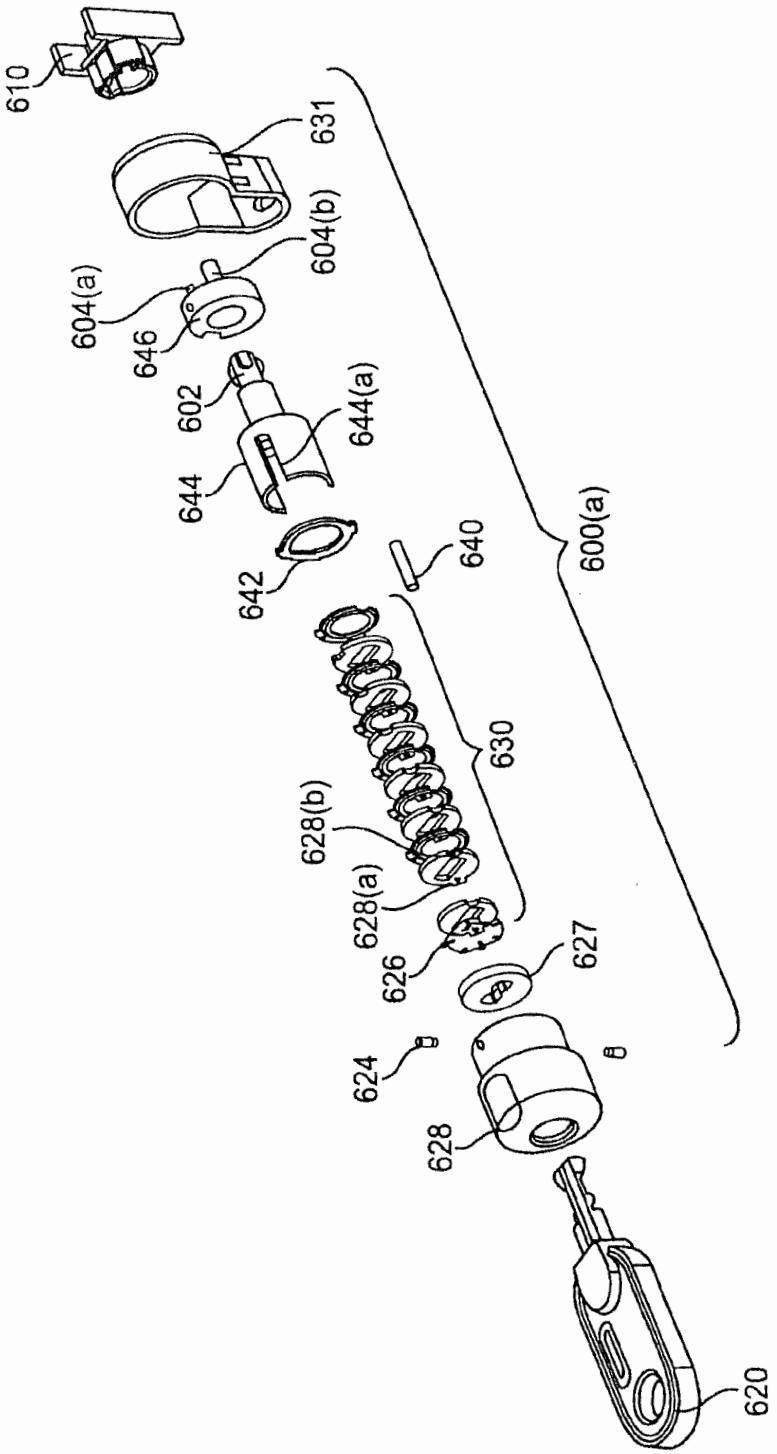


FIG. 8

Ex. 1002 - Page 712 of 997

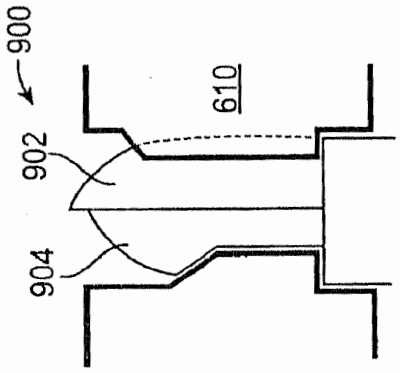


FIG. 9(c)

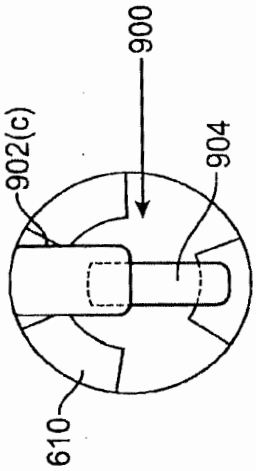


FIG. 9(d)

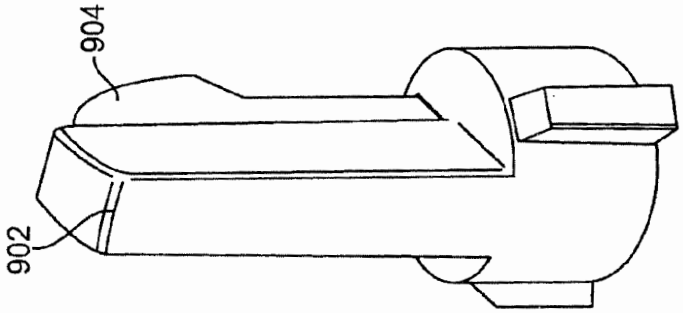


FIG. 9(b)

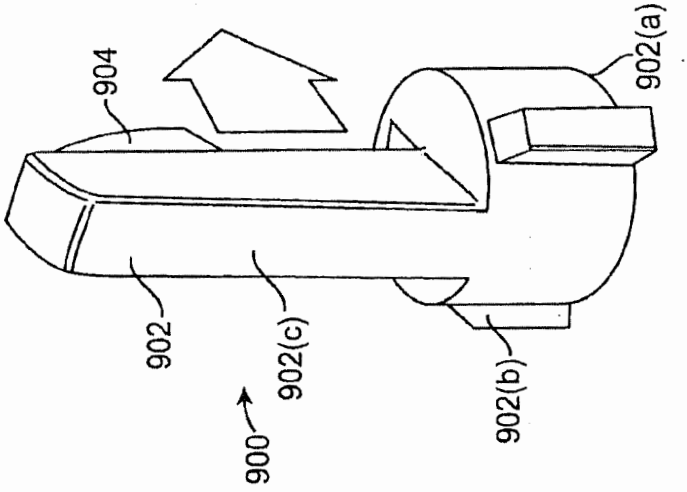


FIG. 9(a)

Ex. 1002 - Page 714 of 997

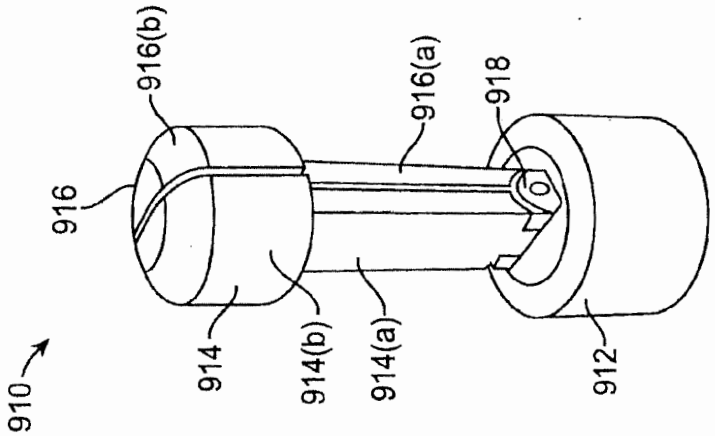


FIG. 10(a)

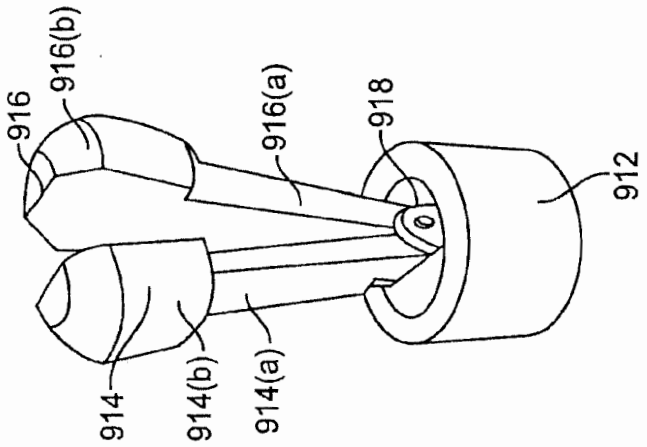


FIG. 10(b)

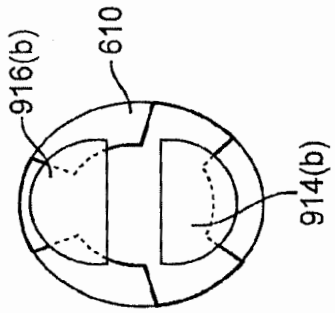


FIG. 10(c)

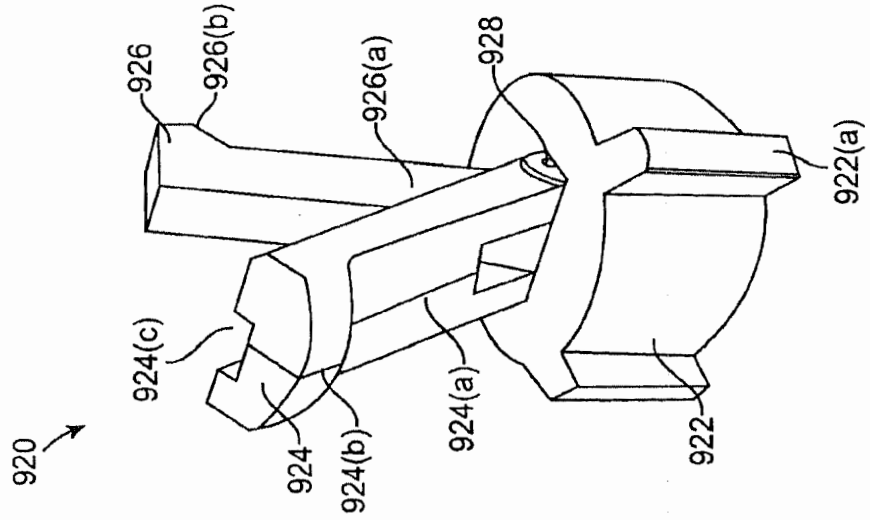


FIG. 11(a)

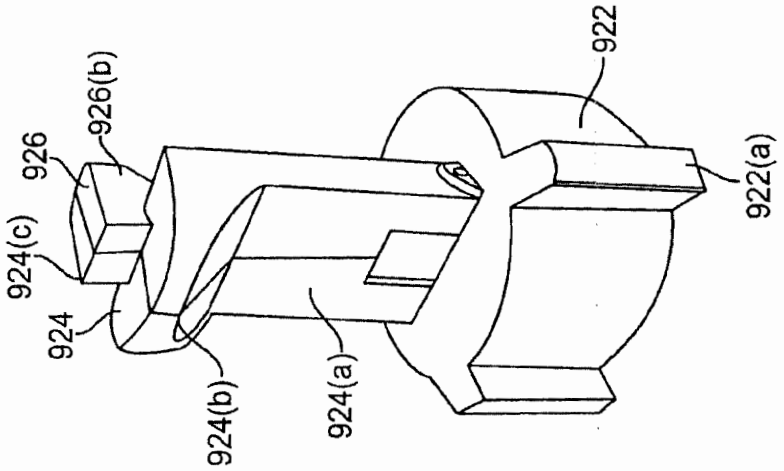


FIG. 11(b)

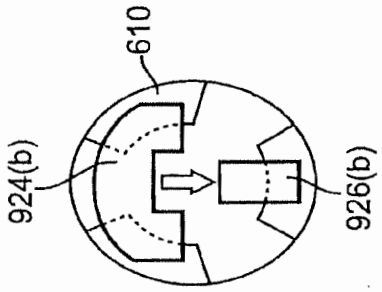


FIG. 11(c)

Ex. 1002 - Page 715 of 997

Ex. 1002 - Page 716 of 997

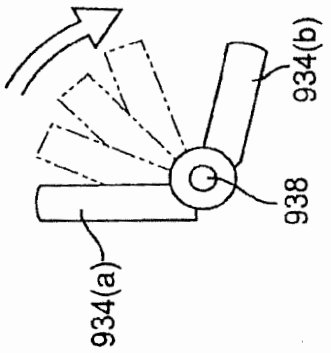


FIG. 12(c)

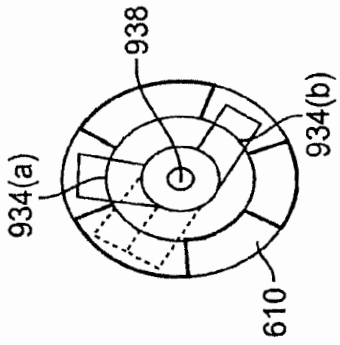


FIG. 12(b)

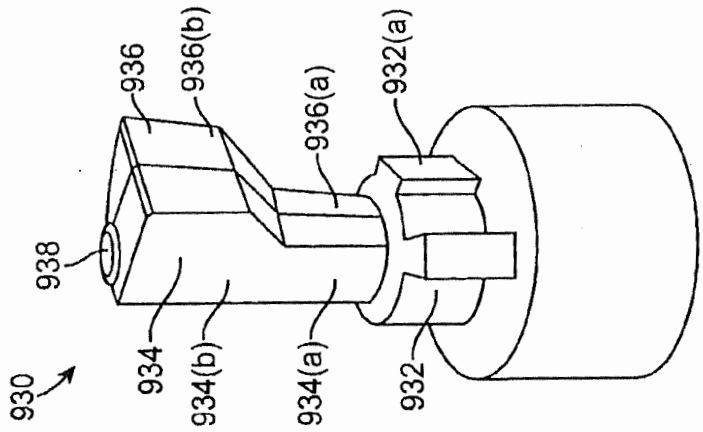


FIG. 12(a)

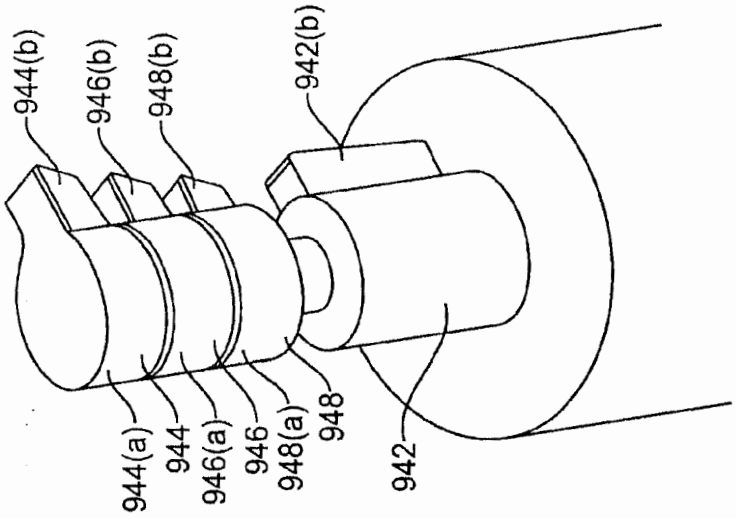


FIG. 13(c)

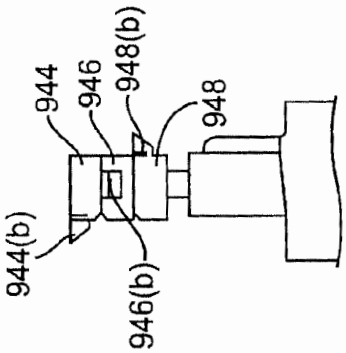


FIG. 13(b)

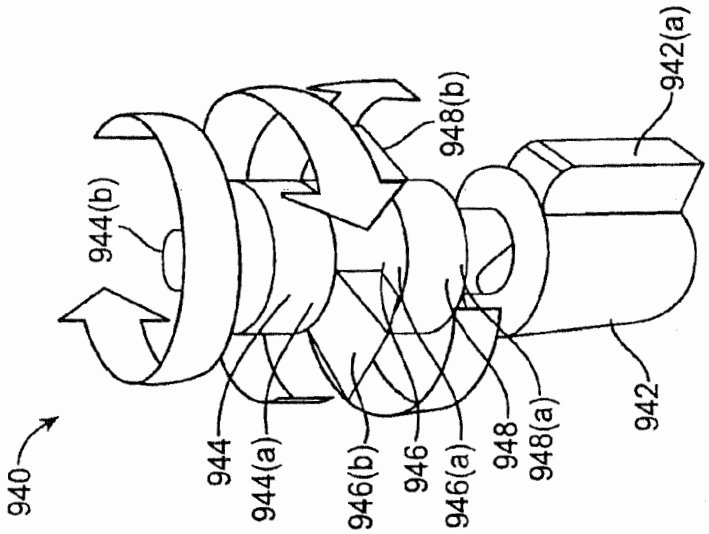


FIG. 13(a)

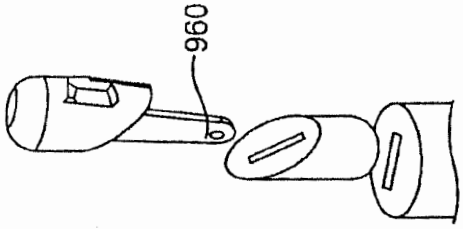


FIG. 14(c)

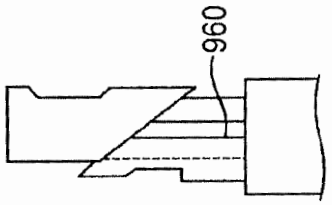


FIG. 14(e)

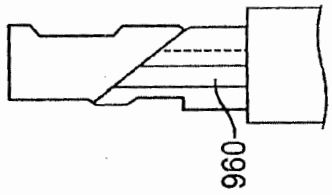


FIG. 14(d)

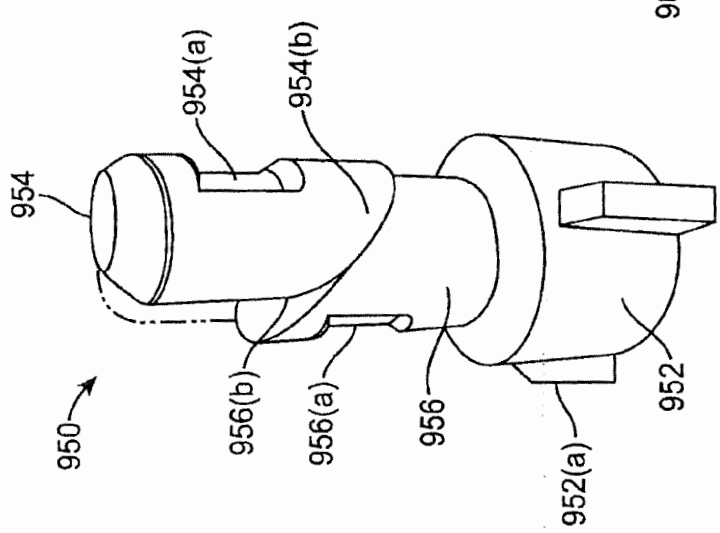


FIG. 14(b)

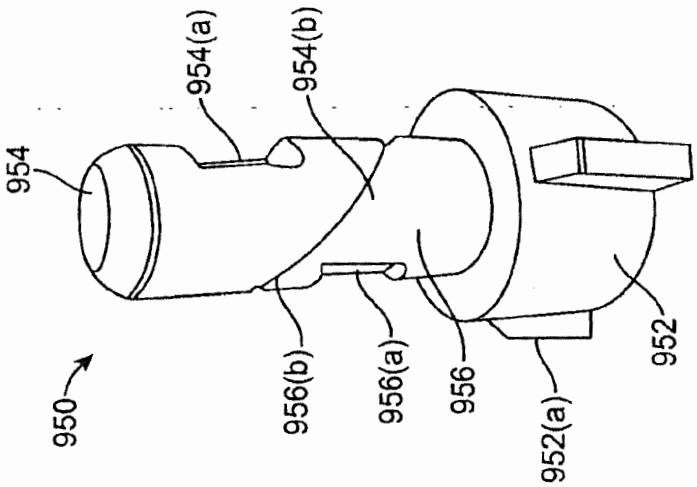


FIG. 14(a)

Ex. 1002 - Page 718 of 997

Ex. 1002 - Page 719 of 997

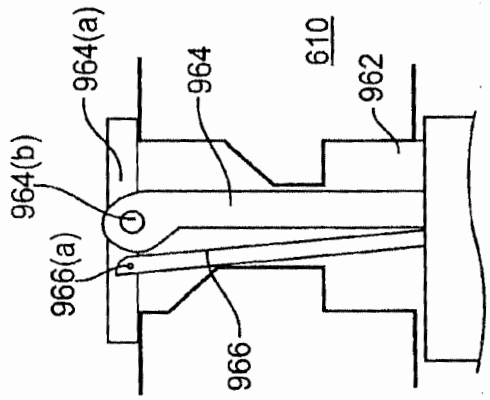


FIG. 15(c)

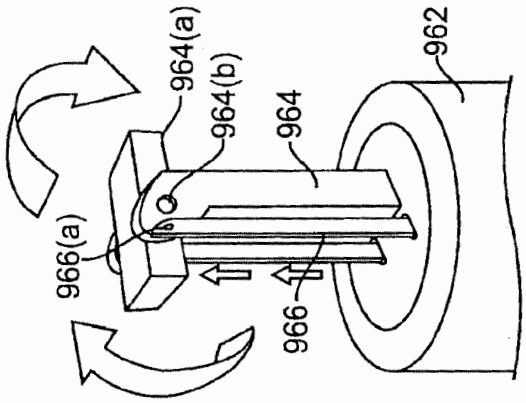


FIG. 15(b)

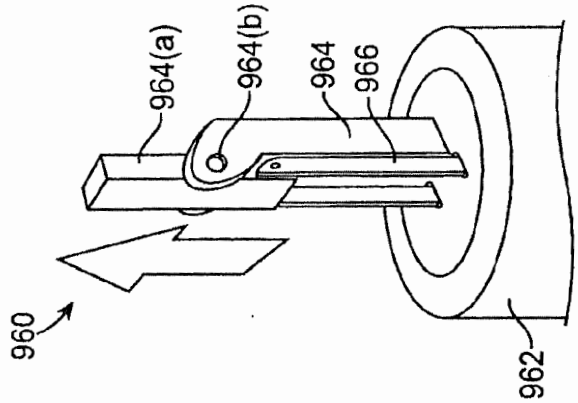


FIG. 15(a)

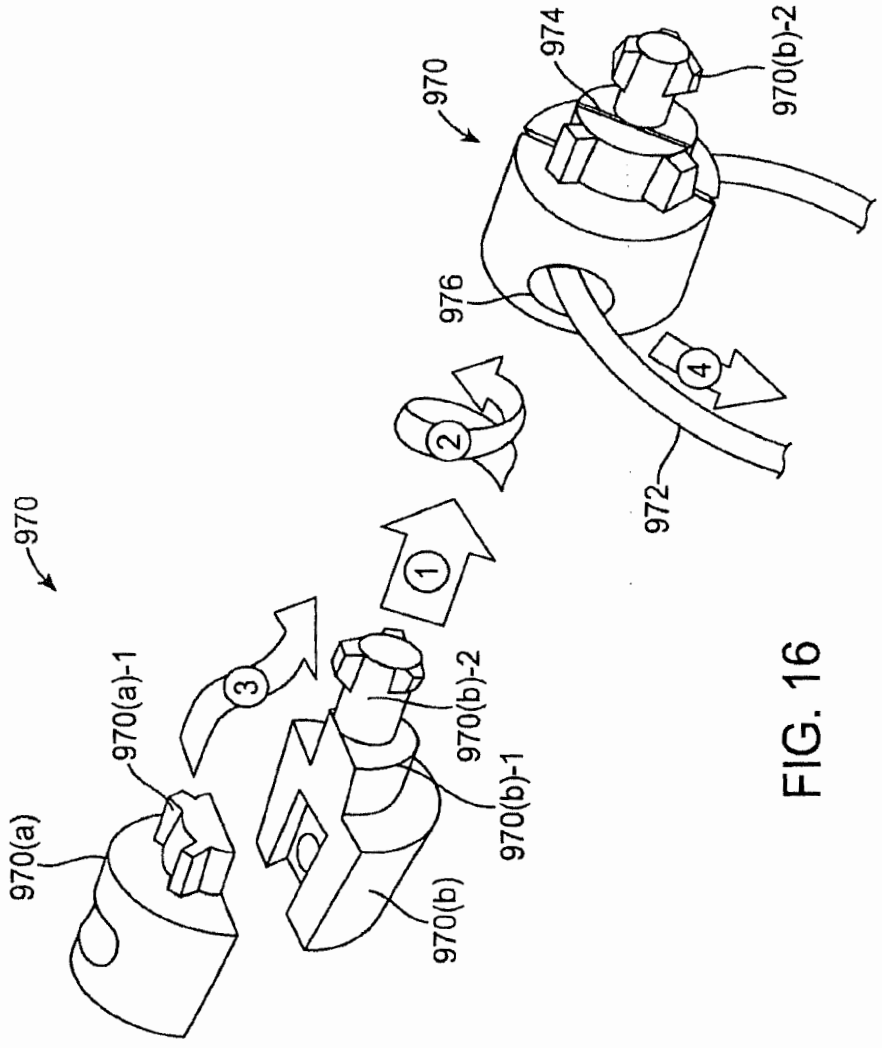


FIG. 16

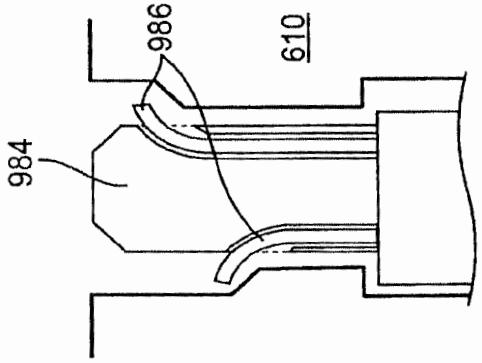


FIG. 17(c)

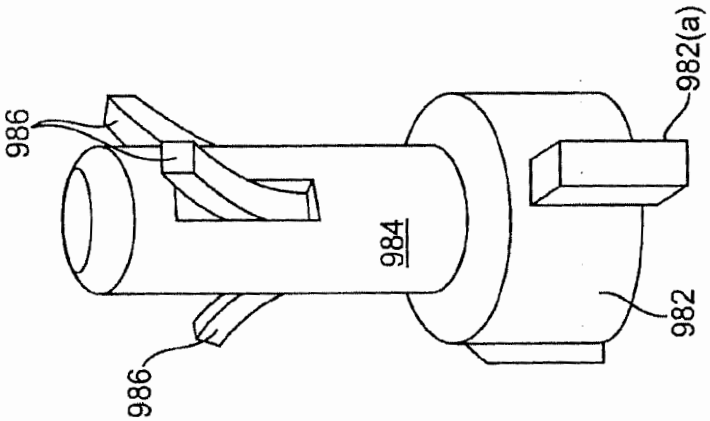


FIG. 17(b)

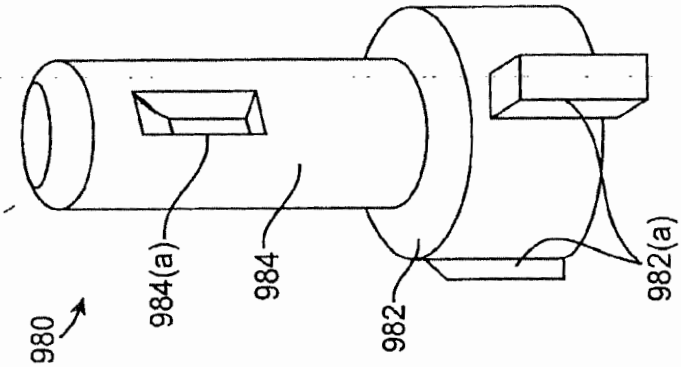


FIG. 17(a)

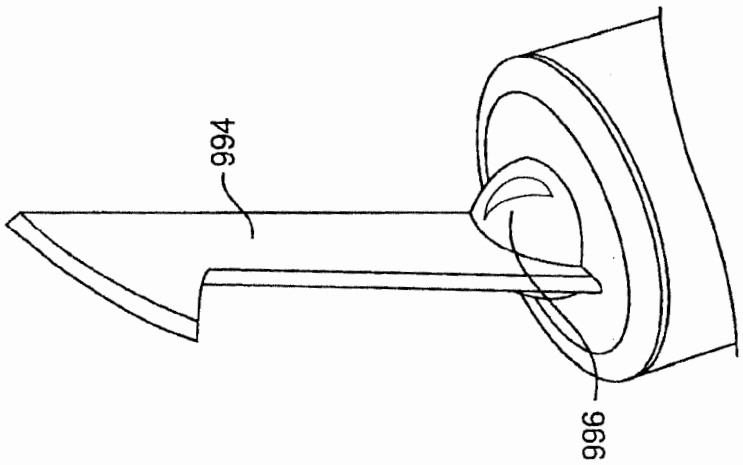


FIG. 18(c)

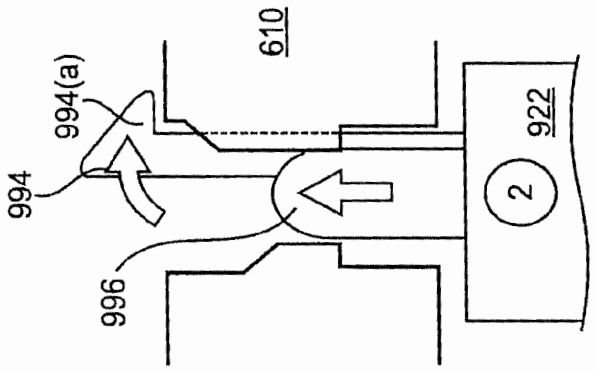


FIG. 18(b)

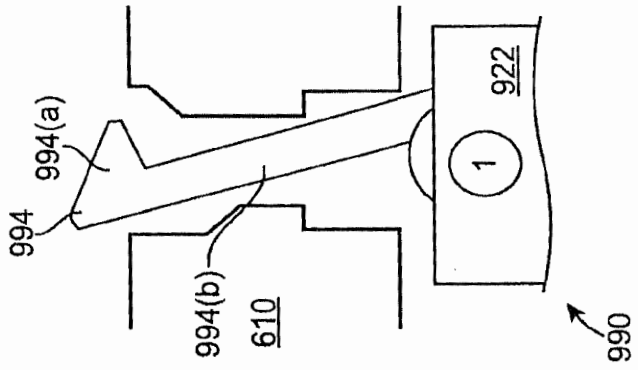


FIG. 18(a)

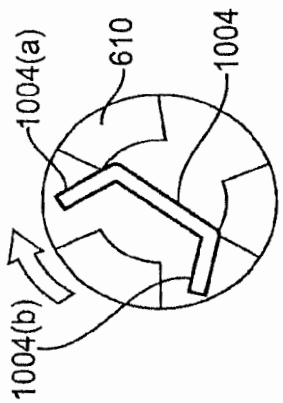


FIG. 19(c)

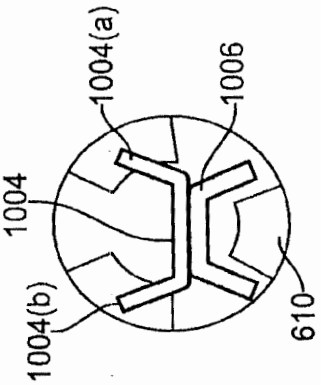


FIG. 19(d)

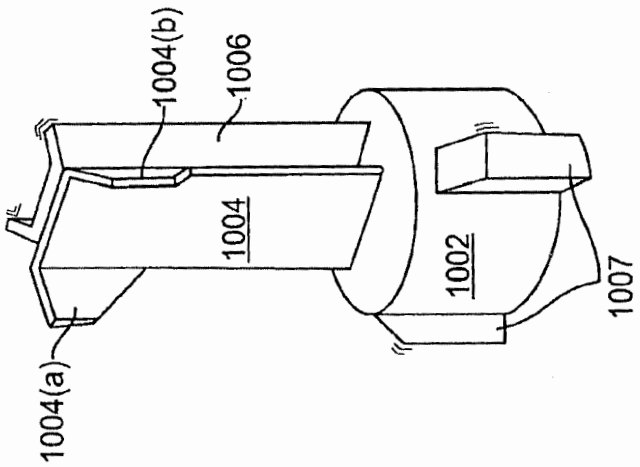


FIG. 19(b)

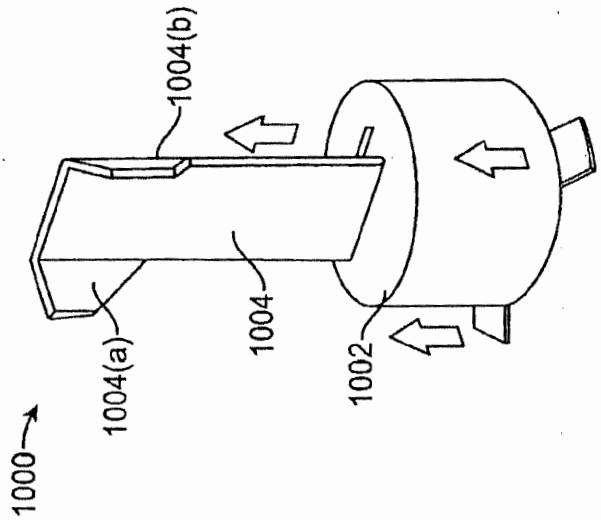


FIG. 19(a)

Ex. 1002 - Page 723 of 997

Ex. 1002 - Page 724 of 997

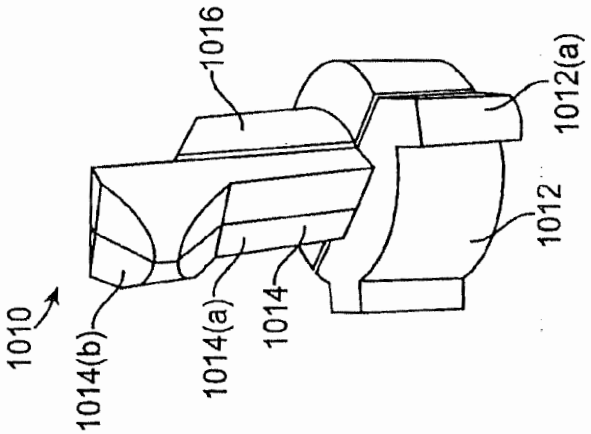


FIG. 20(a)

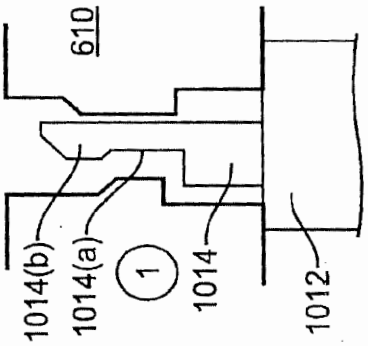


FIG. 20(b)

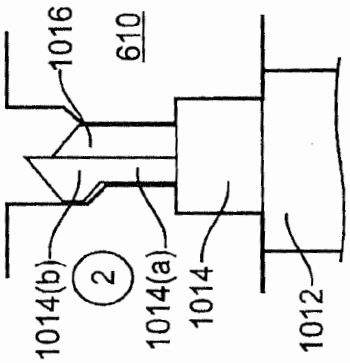


FIG. 20(c)

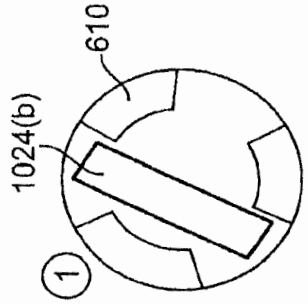


FIG. 21(c)

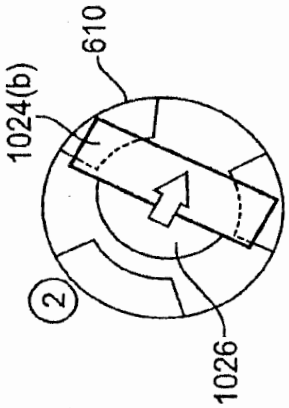


FIG. 21(d)

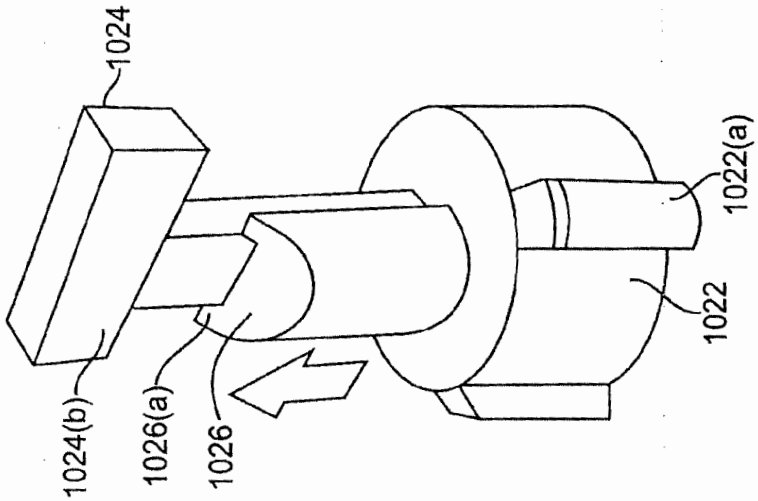


FIG. 21(b)

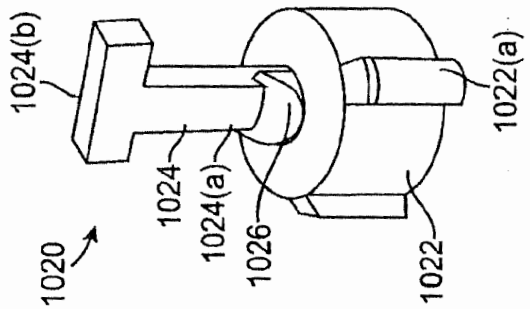


FIG. 21(a)

Ex. 1002 - Page 725 of 997

Ex. 1002 - Page 726 of 997

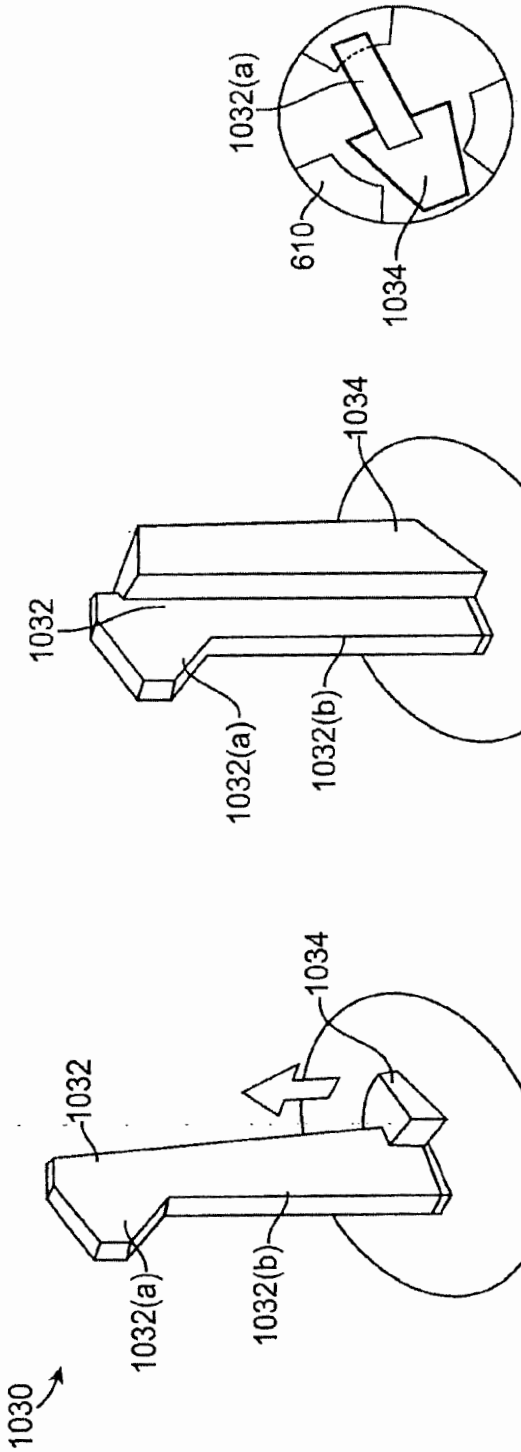


FIG. 22(a)

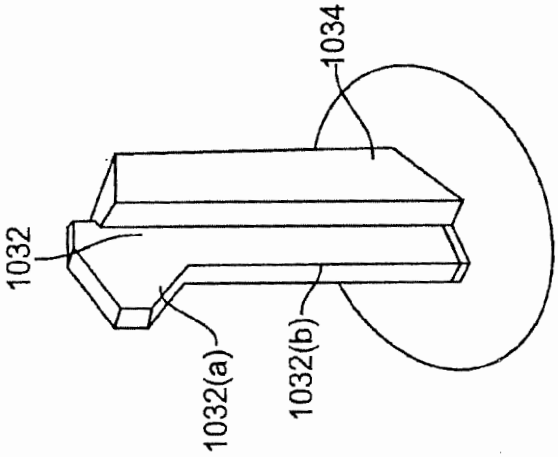


FIG. 22(b)

FIG. 22(c)

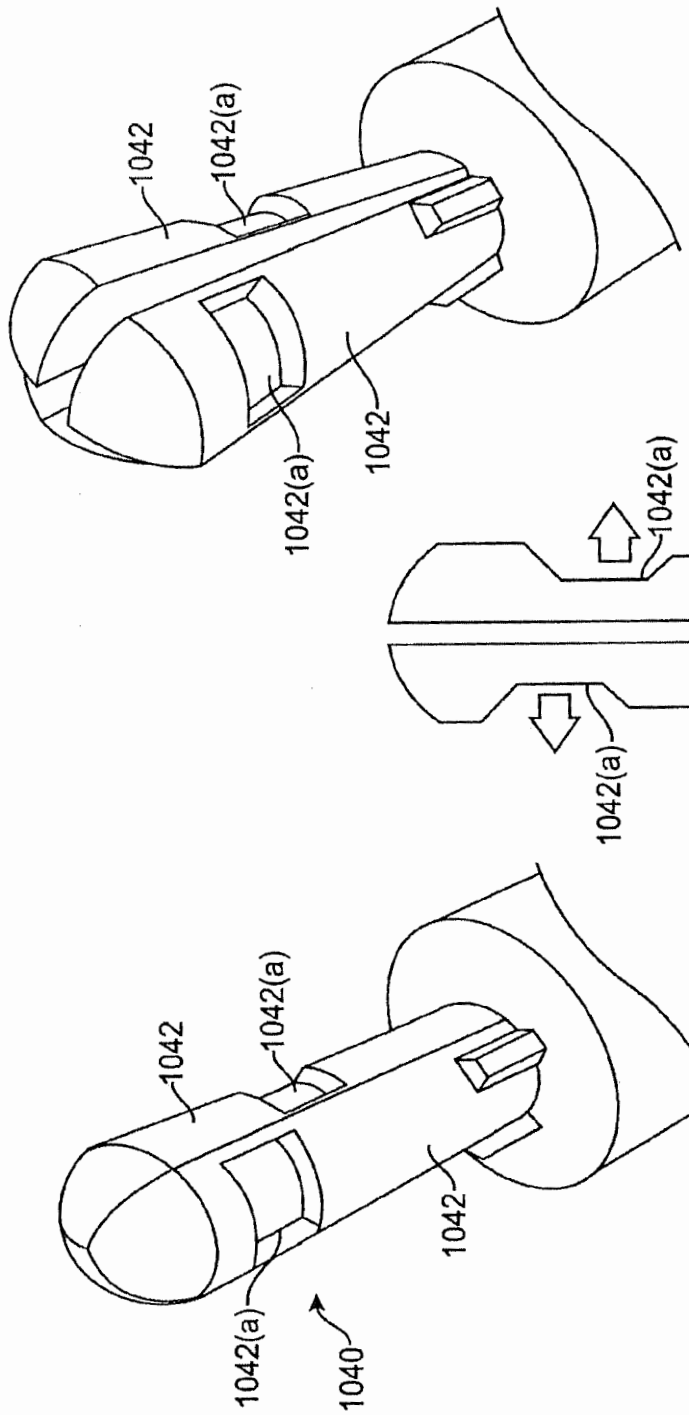


FIG. 23(b)

FIG. 23(c)

FIG. 23(a)

Ex. 1002 - Page 727 of 997

Ex. 1002 - Page 728 of 997

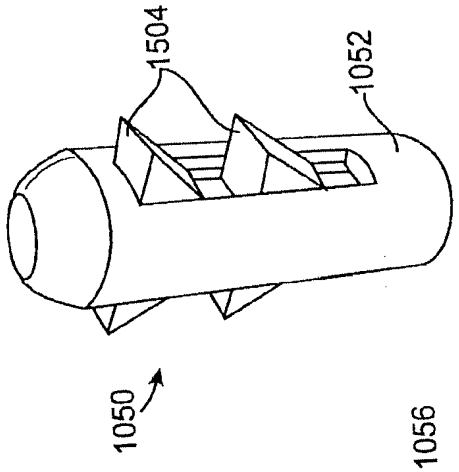


FIG. 24(c)

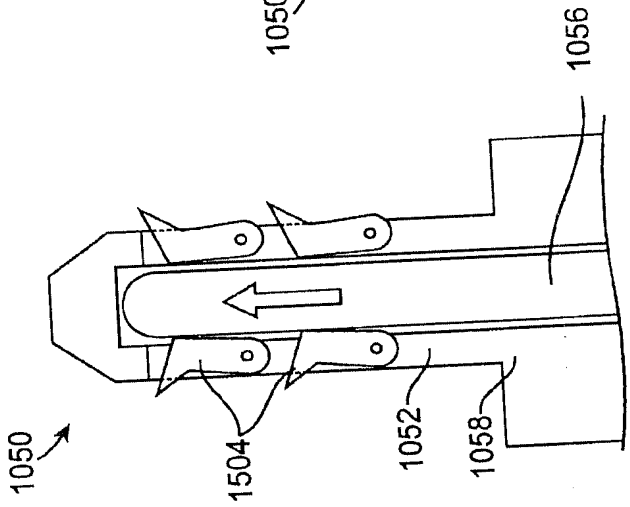


FIG. 24(b)

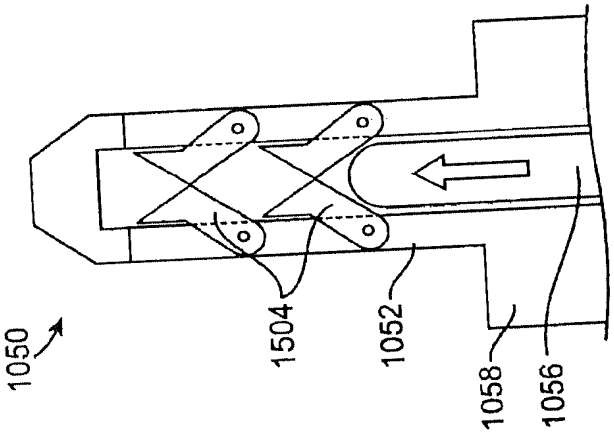


FIG. 24(a)

Ex. 1002 - Page 729 of 997

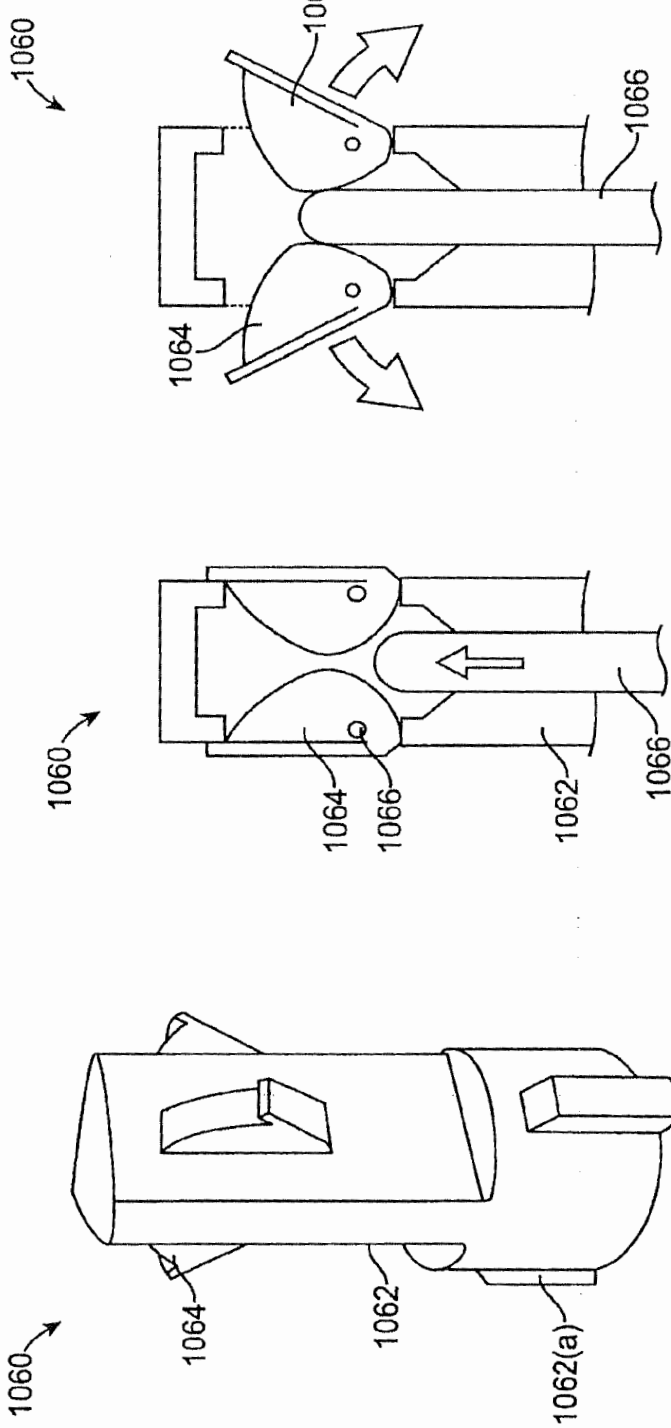


FIG. 25(c)

FIG. 25(b)

FIG. 25(a)

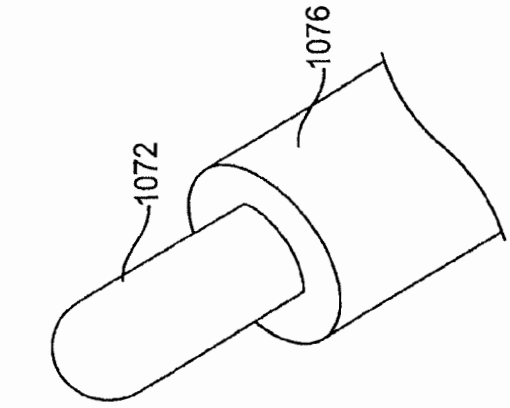


FIG. 26(c)

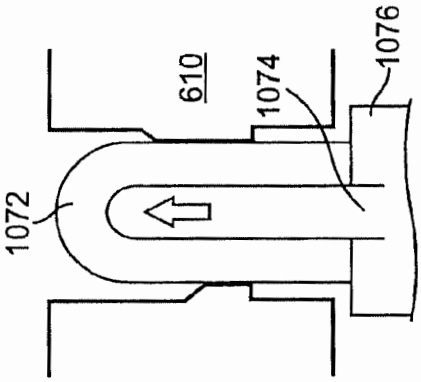


FIG. 26(b)

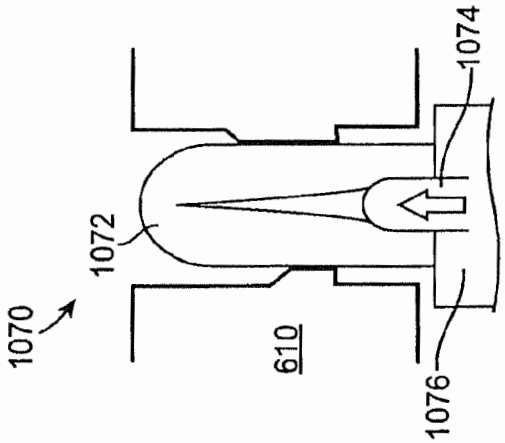


FIG. 26(a)

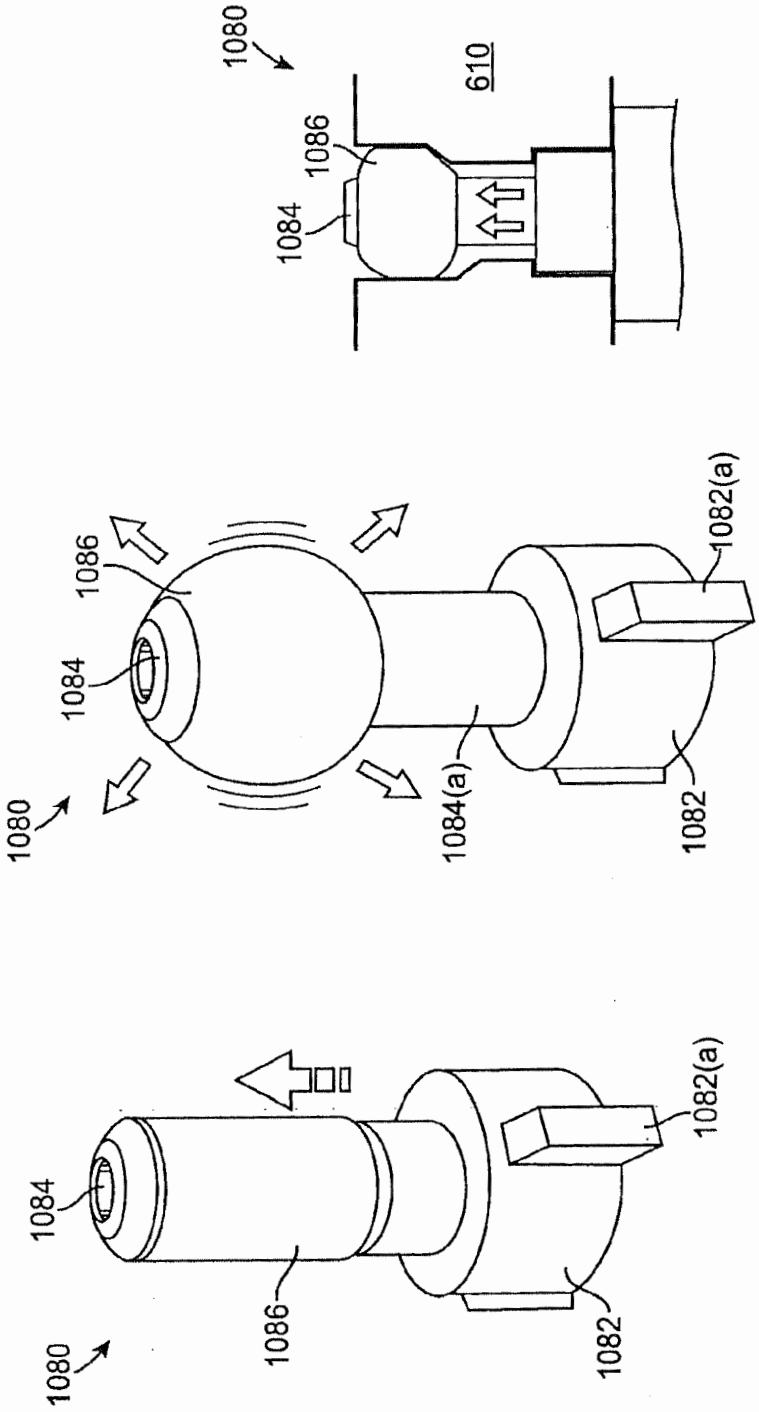


FIG. 27(a)

FIG. 27(b)

FIG. 27(c)

Ex. 1002 - Page 731 of 997

Ex. 1002 - Page 732 of 997

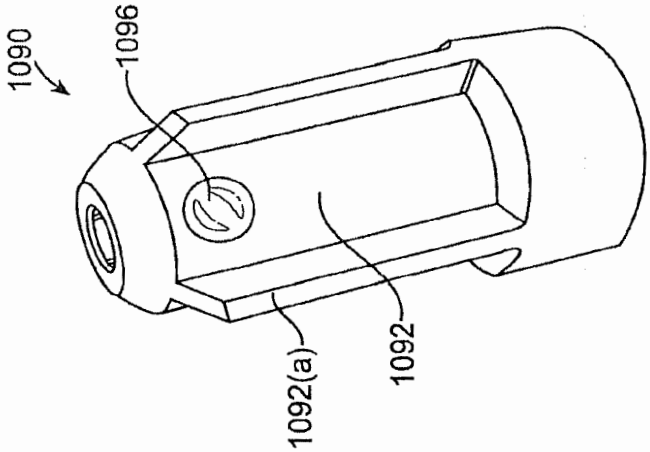


FIG.28(b)

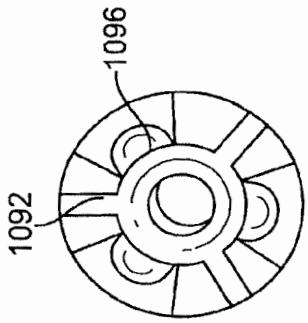


FIG.28(c)

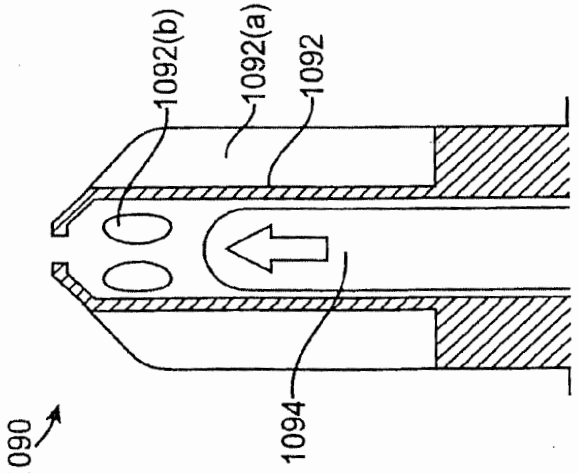


FIG.28(a)

Ex. 1002 - Page 733 of 997

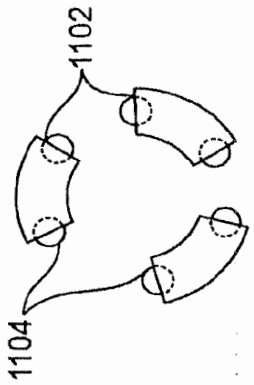


FIG. 29(c)

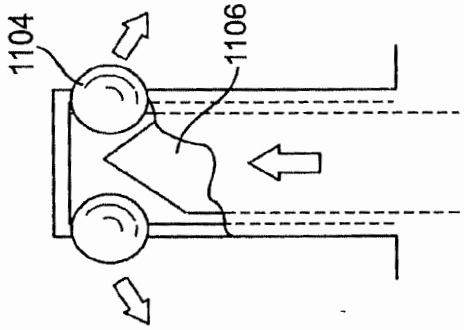


FIG. 29(b)

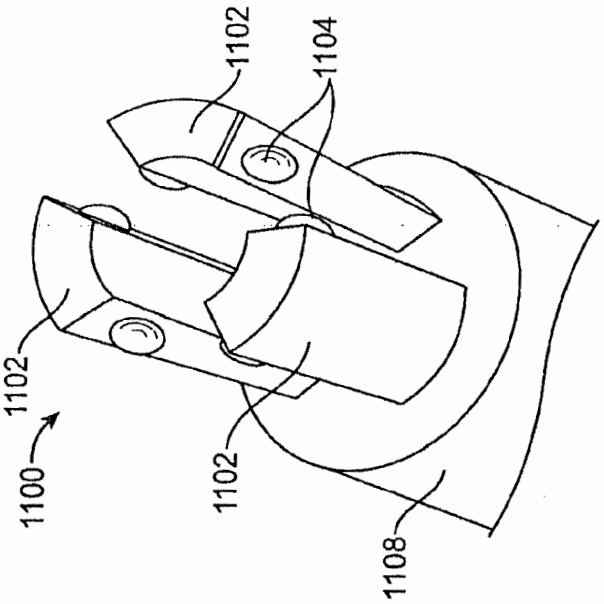


FIG. 29(a)

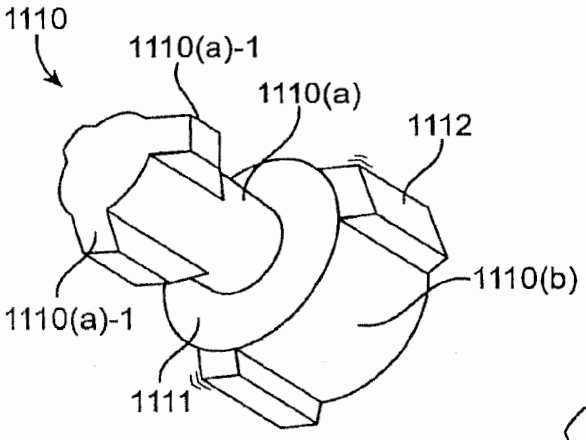


FIG. 30(a)

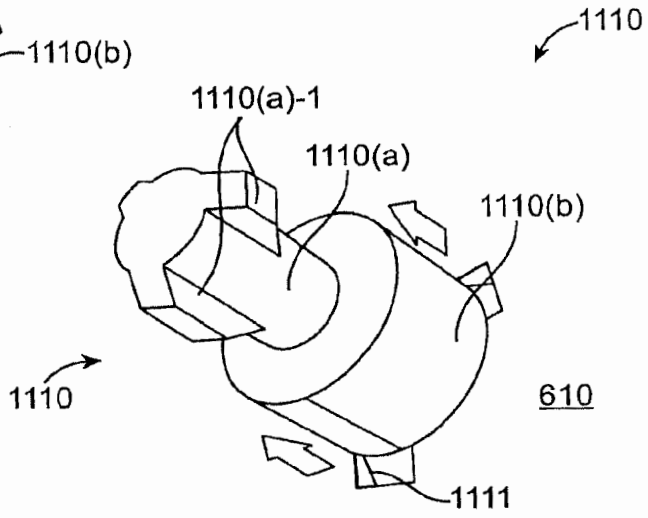


FIG. 30(b)

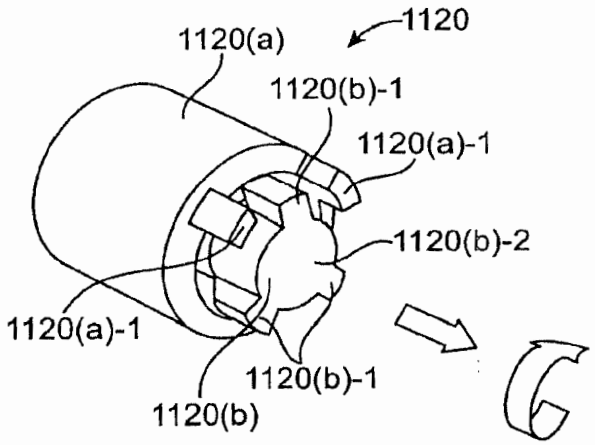


FIG. 31(a)

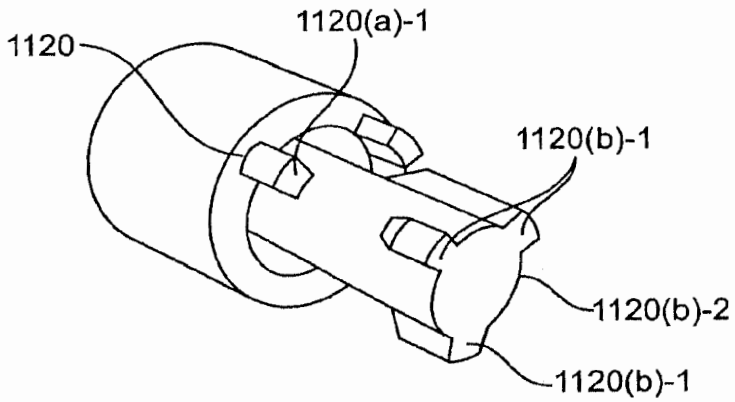


FIG. 31(b)

Ex. 1002 - Page 736 of 997

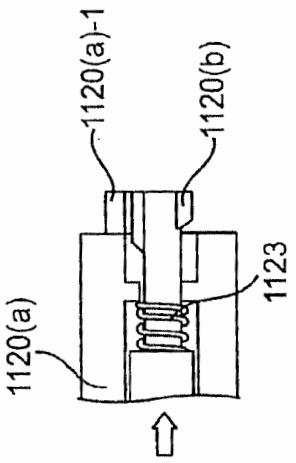


FIG. 32(b)

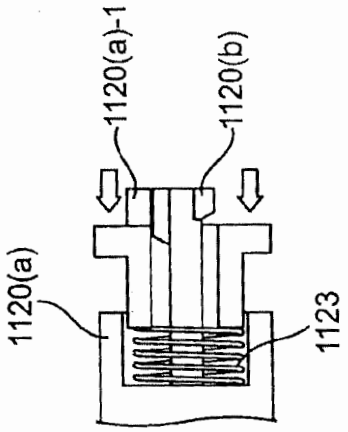


FIG. 32(c)

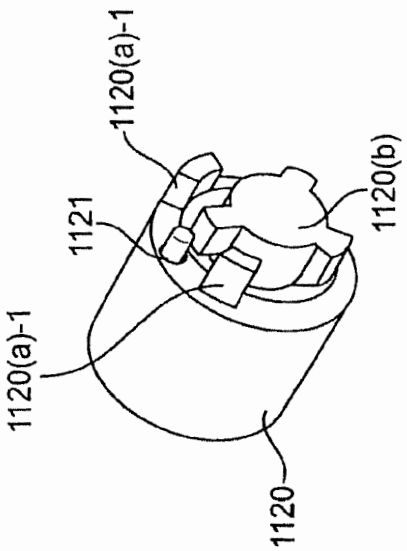


FIG. 32(a)

Ex. 1002 - Page 737 of 997

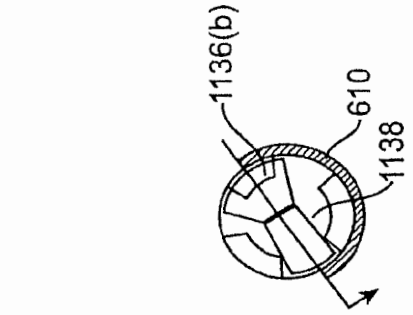


FIG. 33(c)

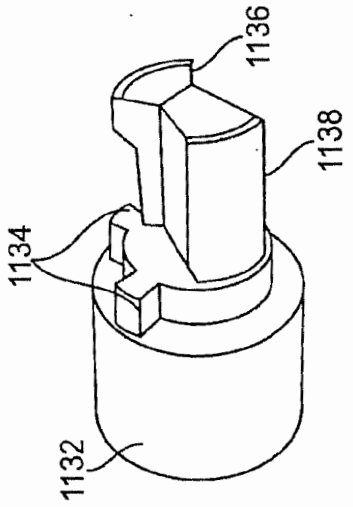


FIG. 33(b)

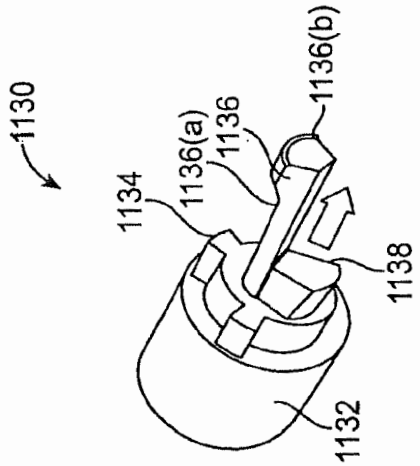


FIG. 33(a)

Ex. 1002 - Page 738 of 997

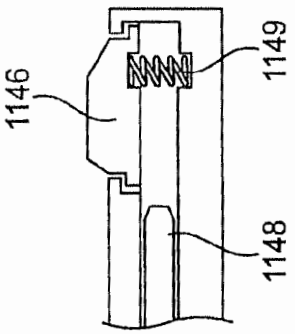


FIG. 34(b)

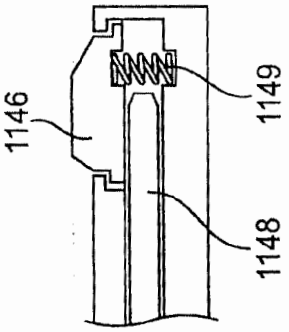


FIG. 34(c)

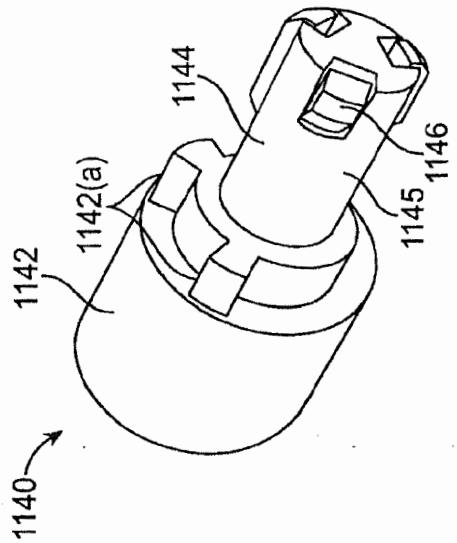


FIG. 34(a)

Ex. 1002 - Page 739 of 997

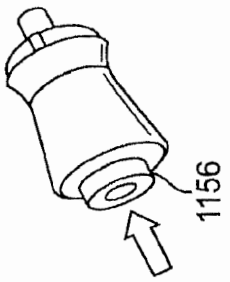


FIG. 35(c)

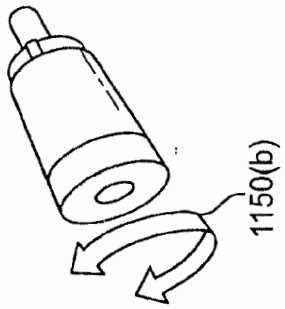


FIG. 35(d)

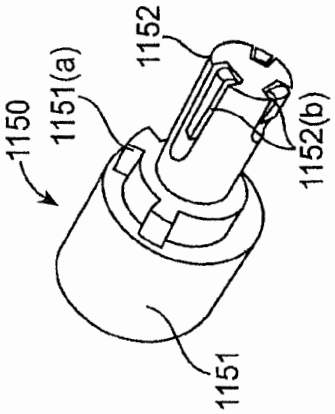


FIG. 35(a)

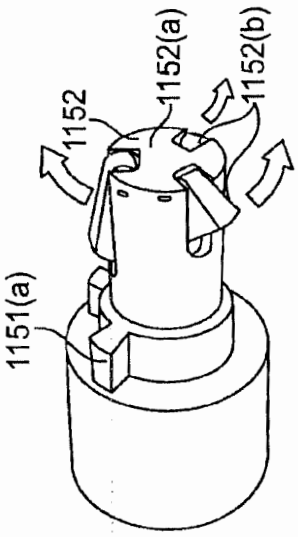


FIG. 35(b)

Ex. 1002 - Page 740 of 997

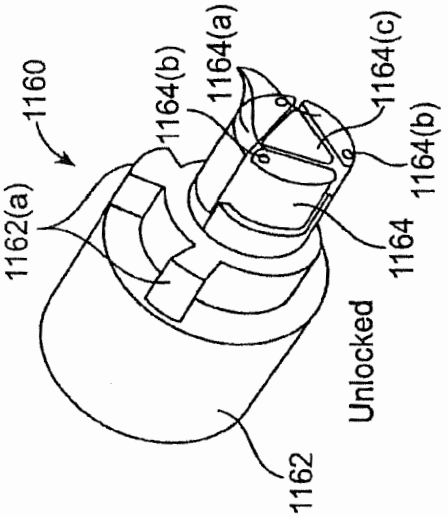


FIG. 36(a)

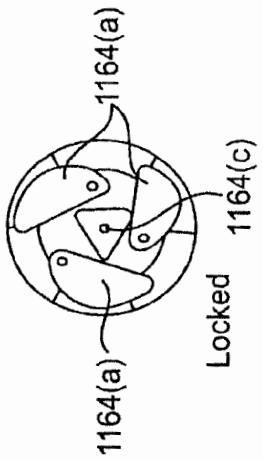


FIG. 36(c)

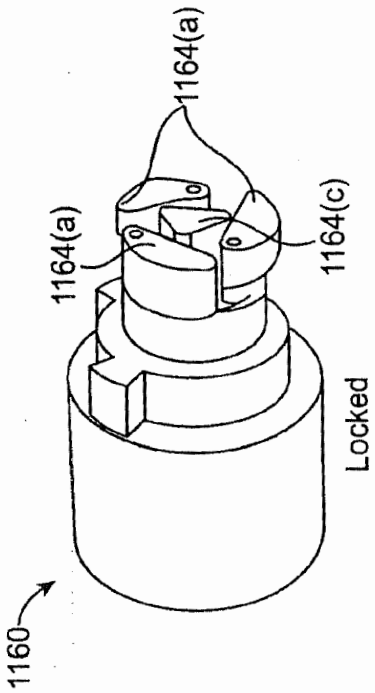


FIG. 36(b)

Ex. 1002 - Page 741 of 997

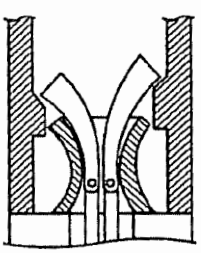


FIG. 37(c)

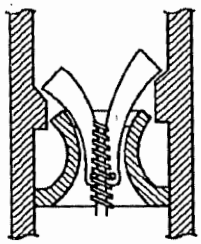


FIG. 37(d)

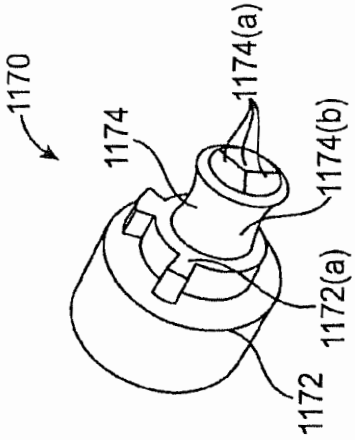


FIG. 37(a)

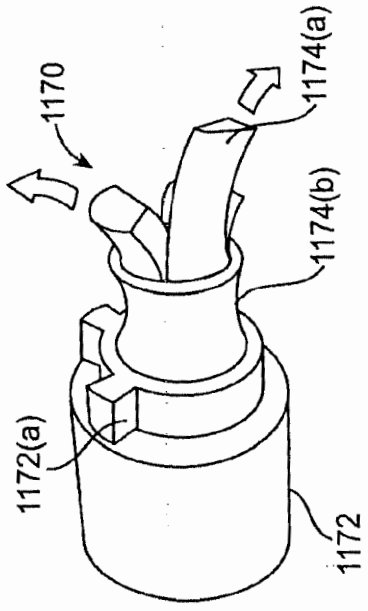


FIG. 37(b)

Ex. 1002 - Page 742 of 997

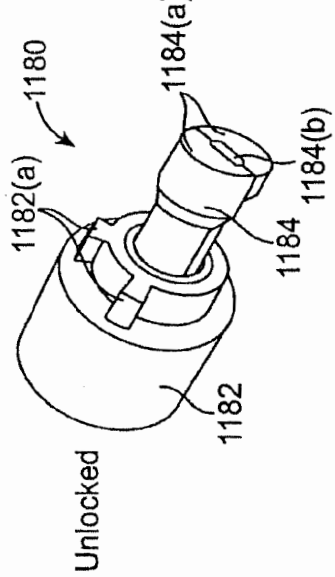


FIG. 38(a)

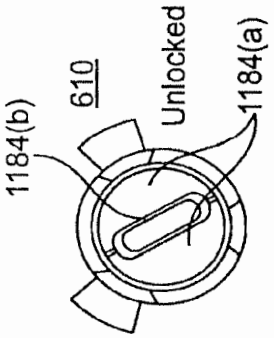


FIG. 38(c)

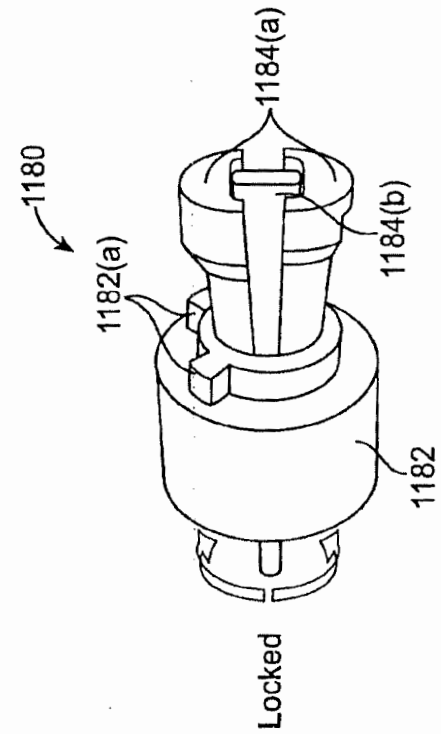


FIG. 38(b)

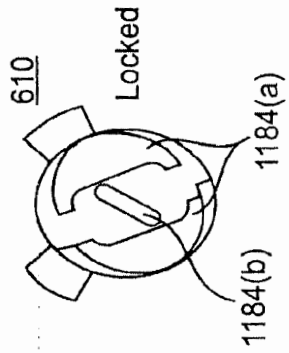


FIG. 38(d)

Ex. 1002 - Page 743 of 997

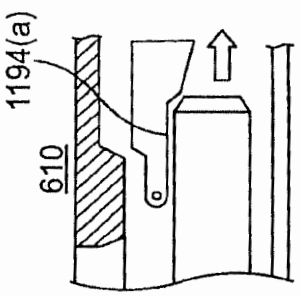


FIG. 39(c)

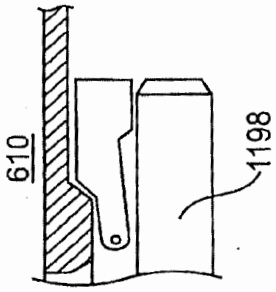


FIG. 39(d)

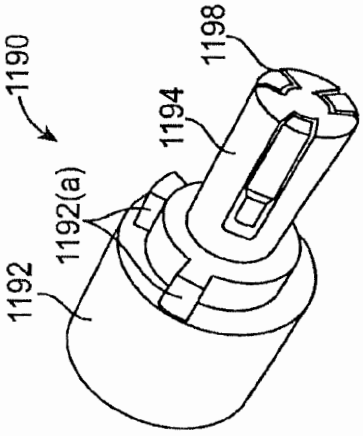


FIG. 39(a)

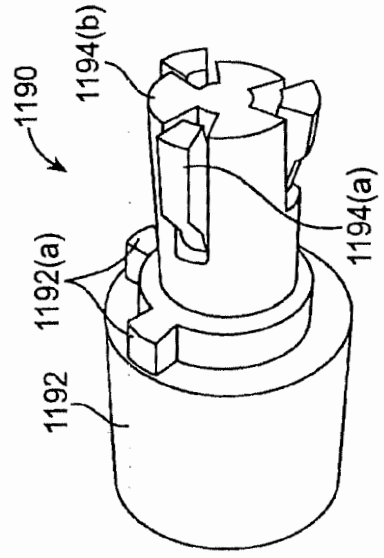


FIG. 39(b)

Ex. 1002 - Page 744 of 997

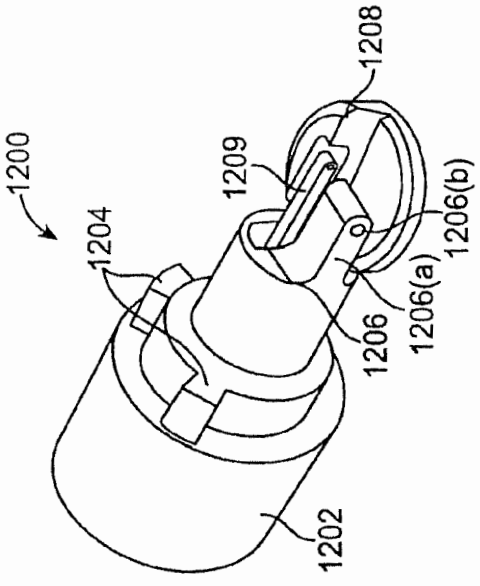


FIG. 40(a)

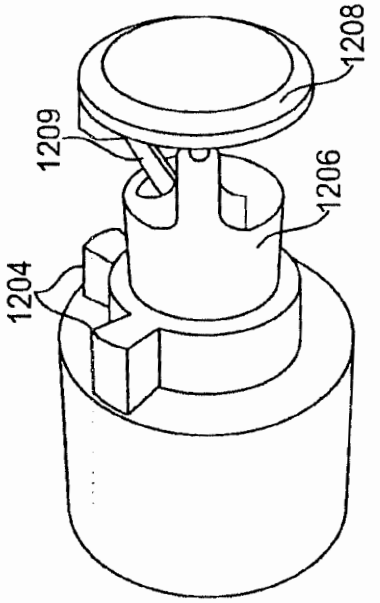


FIG. 40(b)

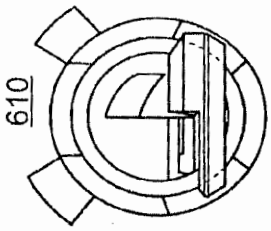


FIG. 40(c)

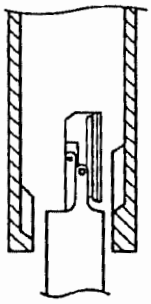


FIG. 40(d)

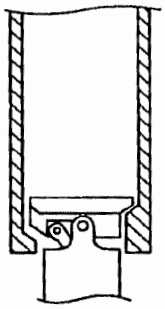


FIG. 40(e)

Ex. 1002 - Page 745 of 997

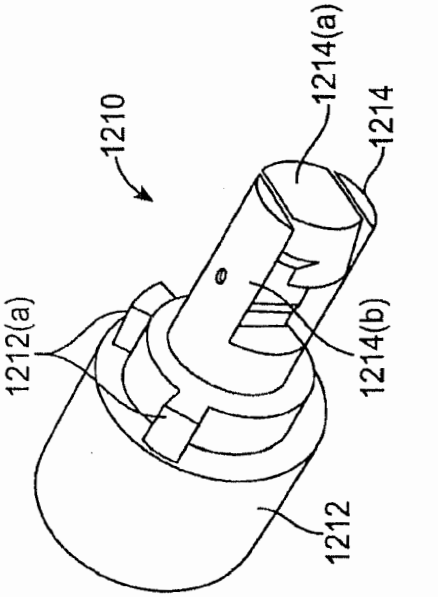


FIG. 41(a)

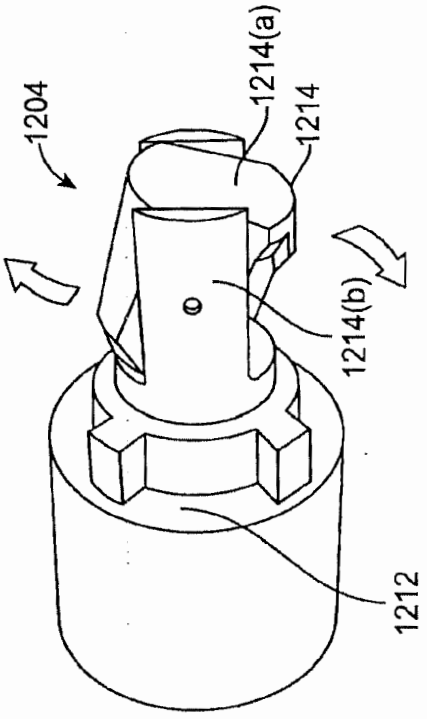


FIG. 41(b)

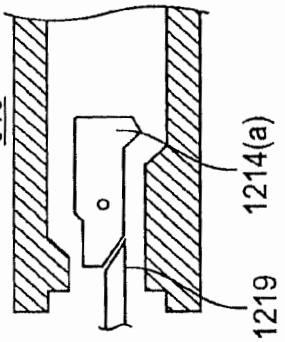


FIG. 41(c)

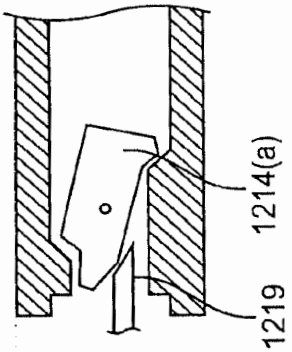


FIG. 41(d)

Ex. 1002 - Page 746 of 997

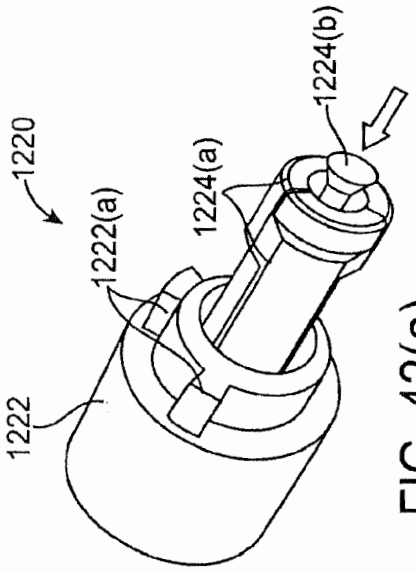


FIG. 42(a)

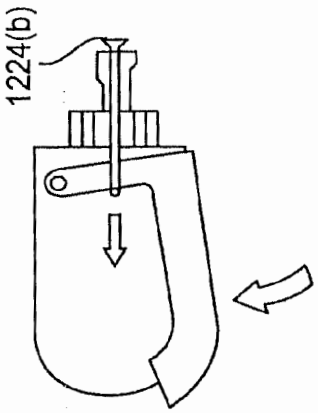


FIG. 42(c)

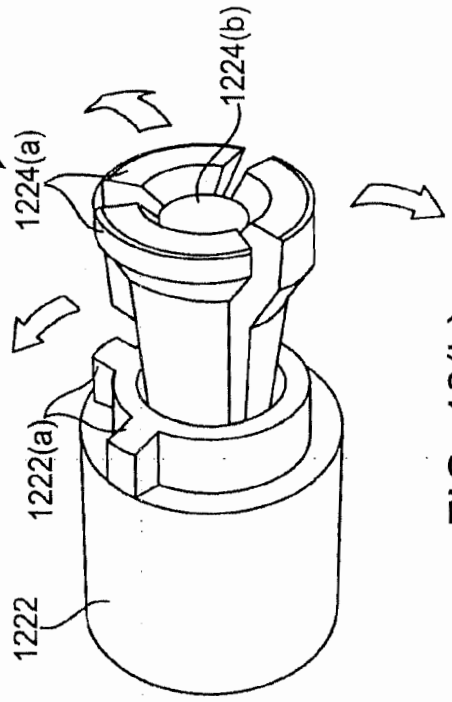


FIG. 42(b)

Ex. 1002 - Page 747 of 997

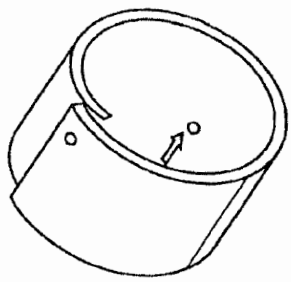


FIG. 43(c)

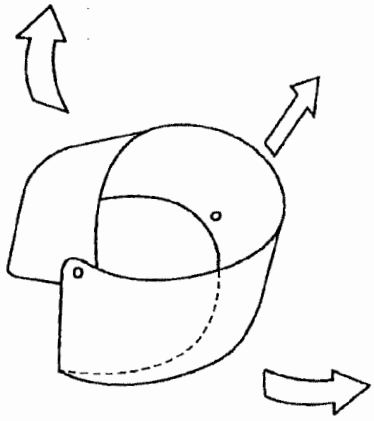


FIG. 43(d)

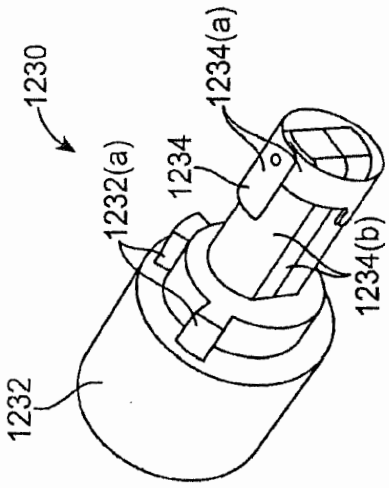


FIG. 43(a)

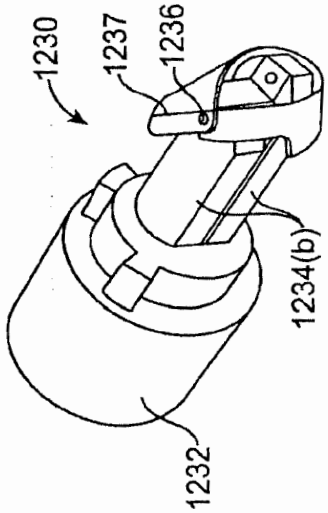


FIG. 43(b)

Ex. 1002 - Page 748 of 997

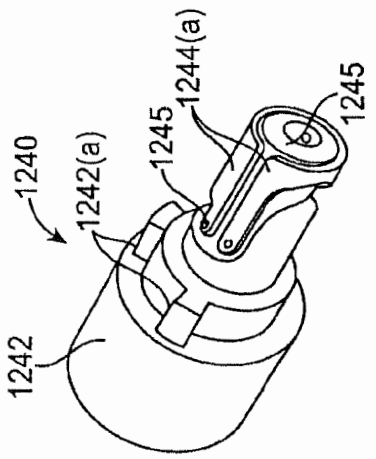


FIG. 44(a)

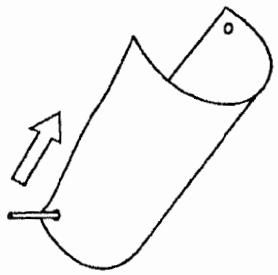


FIG. 44(c)

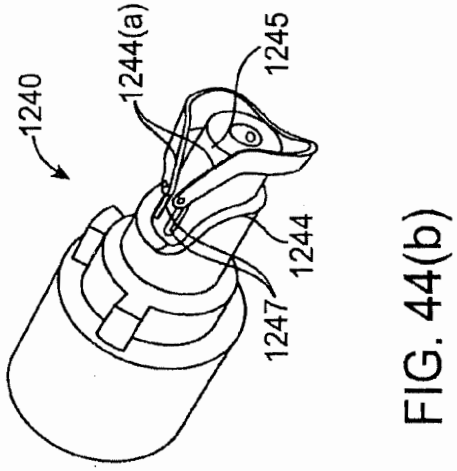


FIG. 44(b)

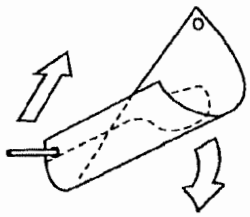


FIG. 44(d)

Ex. 1002 - Page 749 of 997

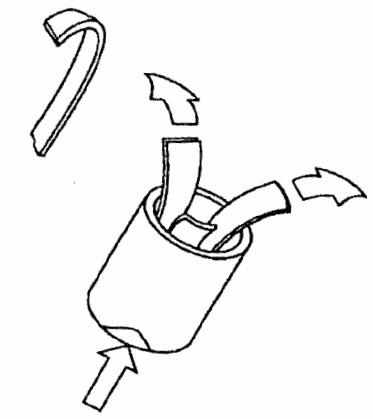


FIG. 45(c)

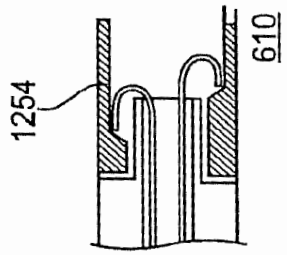


FIG. 45(d)

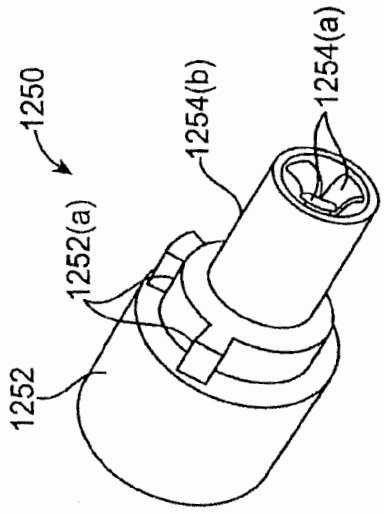


FIG. 45(a)

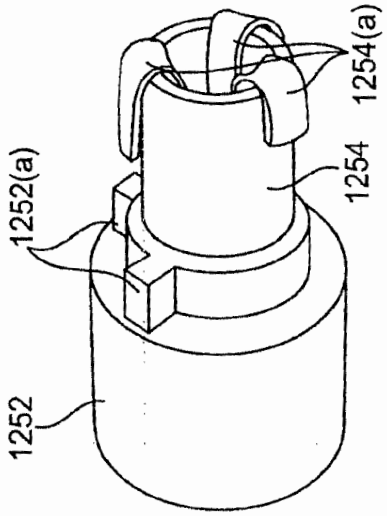


FIG. 45(b)

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
2 May 2008 (02.05.2008)

PCT

(10) International Publication Number
WO 2008/051930 A2

(51) International Patent Classification:
E05B 25/08 (2006.01)

(21) International Application Number:
PCT/US2007/082139

(22) International Filing Date: 22 October 2007 (22.10.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/853,888	23 October 2006 (23.10.2006)	US
60/909,867	3 April 2007 (03.04.2007)	US
60/940,318	25 May 2007 (25.05.2007)	US

(71) Applicant *(for all designated States except US)*: **ACCO BRANDS USA LLC** [US/US]; 300 Tower Parkway, Lincolnshire, Illinois 60069 (US).

(71) Applicant and
(72) Inventor: **KUO, Lambert**; No. 16, Lane 459, Sec. 1, An Ho Road, Tainan (TW).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **ANDRES, Guillermo** [US/US]; 3440 Gavina Place, Pleasanton, California 94566 (US). **WHITE, Ryan** [US/US]; 709 Clayton Street, Apt. 3, San Francisco, California 94117 (US). **HUNG, John** [CA/CA]; 2744 Byron Road, North Vancouver, British Columbia V7H 1M2 (CA).

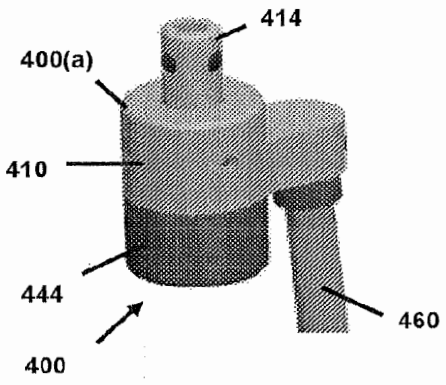
(74) Agents: **JEWIK, Patrick R.** et al.; Townsend and Townsend and Crew LLP, Two Embarcadero Center, 8th Floor, San Francisco, California 94111-3834 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *without international search report and to be republished upon receipt of that report*

(54) Title: SECURITY APPARATUS



(57) Abstract: A security apparatus is disclosed. The security apparatus is used with a lock interface member attached to a housing of a portable electronic device. The security apparatus may include a head comprising a plurality of engagement elements adapted to engage the lock interface member via the engagement regions, where the engagement elements are capable of extending radially outward to engage the engagement regions of the interface member.

WO 2008/051930 A2

SECURITY APPARATUS

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application is a non-provisional of and claims the benefit of the filing dates of the following U.S. provisional patent applications: 60/853,888, filed on October 23, 2006; 60/909,867, filed on April 3, 2007, and 60/940,318, filed on May 25, 2007, which are herein incorporated by reference in their entirety for all purposes.

BACKGROUND

[0002] Embodiments of the present invention relate to devices for inhibiting the theft of relatively small but expensive pieces of equipment.

[0003] Computers have evolved rather rapidly from large, expensive machines usable only by a few, to relatively small, portable machines which are usable by many. In particular, the development of personal computers with significant processing power has made computers available to the general population. It is now common for college and even high school students to have their own computer, and personal computers are in wide spread use as word processors and work stations in almost all forms of business. Personal computers are relatively small and easily transportable, and an undesirable side effect of their proliferation is the fact that the theft of such computers is a significant problem.

[0004] A variety of devices have been developed to inhibit the theft of personal computers and similar equipment. Since personal computer systems involve several components, typically including the computer itself, a separate monitor, keyboard and often a printer, such security systems often employ a cable which attaches each of the components to each other and to a relatively immovable object such as a desk. The principal difficulty in such systems is providing an effective and convenient method for attaching the cable itself to the equipment.

[0005] One way to address the problem of computer security is to provide a small, generally rectangular slot in a wall of a computer. A security apparatus with a locking head may be secured to the computer via the rectangular slot.

[0006] While the conventional rectangular slot solution is effective, improvements could be made. For example, although thieves are deterred from stealing portable computers secured by conventional security mechanisms, in some cases, such thieves may be more interested in the data stored in the computers rather than the computers themselves. Accordingly, the damage that may occur to a computer that may occur during the theft of the computer may not deter a thief who wants the data stored inside of the computer. It would be desirable to improve the strength of the physical coupling between the security apparatus and the computer and so that it is more difficult for potential thieves to separate the security apparatus from the computer.

[0007] Embodiments of the invention address these and other problems, individually and collectively.

BRIEF SUMMARY

[0008] Embodiments of the invention are directed to security apparatuses, systems, and methods for using such security apparatuses. Other embodiments of the invention may be directed to lock interface members and systems and methods incorporating such lock interface members.

[0009] One embodiment of the invention is directed to a security apparatus for use with a lock interface member comprising an aperture and engagement regions. The security apparatus comprises a head comprising a plurality of engagement elements adapted to engage the lock interface member via the engagement regions. The engagement elements are capable of extending radially outward to engage the engagement regions. A security device is coupled to the head.

[0010] Another embodiment of the invention is directed to a system comprising a portable electronic device comprising a lock interface member having an aperture and engagement regions, and a security apparatus for use with the lock interface member. The security apparatus comprises a head comprising a plurality of engagement elements adapted to engage the lock interface member via the engagement regions. The engagement elements are capable of extending radially outward to engage the engagement regions.

[0011] Another embodiment of the invention is directed to a method for securing the above-described security apparatus to the lock interface member. The method comprises: (a) inserting engagement elements into the aperture of the lock interface member; and (b)

pushing the engagement elements radially outward so that the engagement elements engage the lock interface member.

[0012] Another embodiment of the invention is directed to a security apparatus comprising a head comprising a plurality of elongated engagement elements adapted to engage an aperture in a lock interface member in a portable electronic device. The security apparatus comprises a rotatable spindle comprising a plurality of bumps, and a locking mechanism. The bumps on the spindle are configured to push the elongated engagement elements radially outward when the spindle is rotated, and a security device attached to the head.

[0013] Another embodiment of the invention is directed to a system comprising a portable electronic device, an aperture associated with a lock interface member in the portable electronic device, and a security apparatus. The security apparatus comprises a head comprising a plurality of elongated engagement elements adapted to engage the aperture, a rotatable spindle comprising a plurality of bumps, and a locking mechanism. The bumps on the spindle are configured to push the elongated engagement elements radially outward when the spindle is rotated.

[0014] Another embodiment of the invention is directed to a method for using the above-described security apparatus. The method comprises: (a) inserting the plurality of elongated engagement elements into the aperture; (b) rotating the spindle; (c) extending the elongated engagement elements radially outward; and (d) locking the head.

[0015] These and other embodiments of the invention are described in further detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] FIG. 1 shows a perspective view of a portable electronic device and a security apparatus.

[0017] FIG. 2(a) shows a portion of a wall of a portable electronic device and another lock interface member.

[0018] FIG. 2(b) shows a perspective view of a portion of another security apparatus according to an embodiment of the invention.

[0019] FIG. 2(c) shows a perspective view of the portion of the security apparatus shown in FIG. 2(b), as a portion of a head is inserted through an aperture in the wall of a portable electronic device and an aperture in the lock interface member. The engagement elements are in the form of balls and they are not yet engaged with the lock interface member. A portion of the lock interface member and the wall are cut away.

[0020] FIGS. 2(d) and 2(e) are views that are similar to the view in FIG. 2(c), except that the balls are engaged to the lock interface member.

[0021] FIG. 2(f) shows a cross-sectional view of a portion of the balls as they are present in the lock interface member.

[0022] FIG. 2(g) shows a perspective view of a security apparatus comprising balls, wherein the balls are not engaged to a lock interface member attached to a wall of a portable electronic device.

[0023] FIG. 2(h) shows a cross-sectional view of a portion of the balls as they are in a withdrawn position and are not engaged to the lock interface member.

[0024] FIG. 2(i) shows an exploded view of the security apparatus shown in FIG. 5(a), along with other components.

[0025] FIG. 2(k) is a front view of another lock interface member according to an embodiment of the invention.

[0026] FIG. 2(l) is a side, cross-sectional view of the lock interface member shown in FIG. 2(k).

[0027] FIG. 2(m) is a perspective view of the lock interface member shown in FIG. 2(k).

[0028] FIG. 3(a) shows a perspective view of a wall of a housing of a portable electronic device and an aperture in the wall. A security apparatus comprising a head according to another embodiment of the invention is also shown.

[0029] FIG. 3(b) shows a perspective view of the head shown in FIG. 3(a) where engagement elements of the security device do not engage the wall.

[0030] FIG. 3(c) shows a perspective view of the head shown in FIG. 3(c) where the engagement elements do engage the wall.

[0031] FIG. 3(d) shows a perspective side view of the head shown in FIG. 3(a), where a portion of the head and the wall are cut away. The engagement elements engage the wall.

[0032] FIG. 3(e) shows a perspective side view of the head shown in FIG. 3(a), where a portion of the head and the wall are cut away. The engagement elements do not engage the wall.

[0033] FIG. 3(f) shows an exploded view of another head according to another embodiment of the invention.

[0034] FIG. 4(a) is a system comprising a security apparatus of the type shown in FIGS. 3(a)-3(f) and a lock interface member.

[0035] FIG. 4(b) shows the system in FIG. 4(a) wherein engagement elements and a stabilizing element are inserted into an aperture in the lock interface member, but the engagement elements are not yet engaged to the lock interface member.

[0036] FIG. 4(c) shows the system in FIG. 4(a) wherein engagement elements and a stabilizing element are inserted into an aperture in the lock interface member, wherein the engagement elements are engaged to the lock interface member.

[0037] In the Figures, like numerals designate like elements.

DETAILED DESCRIPTION

[0038] Embodiments of the invention are directed to security apparatuses, methods for using security apparatuses, and systems using such security apparatuses. The security apparatuses can be used to prevent or deter the theft of devices such as portable electronic devices.

[0039] In addition, in embodiments of the invention, a lock interface member may be used to enhance security and to improve the strength of the coupling between a portable electronic device and a security apparatus. The lock interface member may be an attachment that may be attached to the housing of the portable electronic device, or it may be integrally formed in the housing or other component of the portable electronic device. For example, in some embodiments, the lock interface member may be integrally formed with (e.g., a wall portion of a wall or chassis portion of a chassis, and the lock interface member may be formed from the same material without an interface), or operatively or physically coupled to

the chassis of the portable electronic device and/or may be operatively or electrically coupled to some electrical component (e.g., a memory chip, disk drive, or microprocessor) in the portable electronic device. In addition, if the lock interface member is a separate component from the wall of the portable electronic device, the lock interface member may be positioned within an aperture formed in a wall of the portable electronic device, or inside of the portable electronic device. Exemplary lock interface members are described in further detail below.

[0040] By using a lock interface member, the strength of the coupling between the security apparatus and the lock interface member is increased over a conventional physical security system including a portable electronic device comprising only a 3 x 7 mm^2 security slot and a physical security apparatus secured to the portable electronic device via the security slot. A conventional security system such as this can withstand 150 lbs of force, because the plastic housing of the portable consumer device can fail or break when this magnitude of force is applied. Also, current locks on the market are designed to withstand 300 lbs of force before they are broken. Further, the ability to "torque" the conventional security apparatus out of a security slot is also of concern. Improved security apparatuses and systems are therefore desirable.

[0041] Using embodiments of the invention, the strength of the coupling between the security apparatus and the portable electronic device may be increased by at least 2, 6, or even 8 times compared to conventional systems. For example, by using embodiments of the invention, it may take more than about 300 lbs of force, or even more than about 500, 1000, or 2000 lbs of force to break the physical coupling between the head in a security apparatus and the lock interface member associated with the portable electronic device to which it is secured. As shown below, the engagement elements and stabilizing elements are preferably cooperatively structured with the internal surfaces of the lock interface member. The potential contact area between the engagement element and the inner surfaces of the lock interface member is more than in a conventional locking system. For example, in some embodiments, the contact area between the lock interface member and parts of a corresponding locking head can be at least about 5 times greater than conventional security systems. This increased contact area can also provide for better load distribution when stresses are applied to mating surfaces. The engagement elements and the stabilizing elements are also stronger than conventional elements in conventional locks, and weak links are reduced as compared to conventional security systems. Accordingly, embodiments of the

invention are stronger and therefore more effective at deterring and preventing the theft of portable electronic devices than conventional security systems.

[0042] A security apparatus according to an embodiment of the invention may comprise a head and a security device. The head and the security device may be physically and/or operationally coupled together.

[0043] The security device may comprise a cable, or some other type of device to provide security. If the security device comprises a cable, then the cable may be secured to an immovable object such as a desk or cabinet so that a portable electronic device coupled to the cable cannot be removed. The cable may comprise stainless steel, Kevlar®, or some other type of strong material.

[0044] In another embodiment, the security device may comprise a wireless device such as a wireless transmitter and/or receiver. The wireless device may be used in a proximity detection system or a motion detection system. For example, a motion detector could present in the wireless device so that when the motion detector moves, an associated alarm is triggered. The alarm may be in the security device or may be external to the security device. In another embodiment, there may be a base device associated with the wireless device, and these components may be used in a proximity detection system. Wireless signals may be transmitted between the security device and the base device, and when these devices are separated by a predetermined distance, an associated alarm (e.g., an audible alarm) may be triggered. The alarm could be in the base device or in the security device. The electronics associated with such wireless systems are known to those of ordinary skill in the art.

[0045] The head in the security apparatus may be a locking head. A locking head according to an embodiment of the invention may comprise a locking mechanism such as a key locking mechanism or a combination locking mechanism disposed within a locking head housing. Various types of locking heads are described in further detail below.

[0046] The portable electronic device that is to be secured may comprise any suitable device. Examples of such devices comprise portable computers such laptop, desktop, and server computers, flat panel televisions, projectors, monitors, portable music players, printers, external hard-drives, cell phones, etc.

[0047] The parts of the locking head and/or the lock interface member may be made of any suitable material, and may be formed in any suitable manner. Suitable materials

include materials such as stainless steel, nickel alloys, etc. They can be formed by machining, molding, etc.

[0048] As used herein, in the above described embodiments and in other embodiments, an "aperture" may include a blind aperture or a through aperture. A through aperture may be in the form of a hole, or a recess. Apertures according to embodiments of the invention can be of any suitable size, but preferably have dimensions less than about 10 mm in some embodiments.

[0049] FIG. 1 shows a system comprising a portable electronic device **30** and a security apparatus **26** that is used to secure the portable electronic device **30** to an immovable object **10** such as a desk leg or the like. The security apparatus **26** comprises a head **28** and a cable **32** coupled to the head **28**, which may be a locking head in this example. A loop **34** is at a terminal end of the head **28**. The cable **32** may comprise a strong material such as stainless steel or Kevlar™.

[0050] To secure the portable electronic device **30** to the immovable object, the cable **32** may be wrapped around the immovable object and the head **28** may pass through the loop **34**. An engagement element in the head **28** may then be inserted into an aperture in the portable electronic device **30**, or in an aperture in a lock interface member that is associated with the portable electronic device **30**. Before, during, or after this, a stabilizing element may then be inserted into the aperture in the lock interface member to stabilize the head **28** so that the engagement element cannot be readily withdrawn from the aperture. A locking mechanism such as a key locking mechanism or a combination locking mechanism may be used to keep the stabilizing element and/or the engagement element from moving or not moving.

[0051] An embodiment of the invention can be directed to a security apparatus for use with a lock interface member comprising an aperture and engagement regions. The security apparatus comprises a head comprising a plurality of engagement elements adapted to engage the lock interface member via the engagement regions, wherein the engagement elements are capable of extending radially outward to engage the engagement regions. The engagement regions may be structurally discrete or non-discrete regions. For example, in some cases, the engagement regions may be a single curved surface with areas for engagement by many engagement elements. A security device may be coupled to the head.

[0052] FIG. 2(a) shows a lock interface member **402** attached to the inner surface of a wall **404**. The wall **404** may be part of a housing of a portable electronic device (not shown). In this example, the lock interface member **402** is circular or disk-shaped.

[0053] A security apparatus **400** that can be used with the lock interface member **402** is shown in FIG. 2(b). The security apparatus **400** comprises a head **400(a)** attached to a cable **460**. The head **400(a)** includes a cable ring **410** and a body **444** which may form a housing as in other embodiments of the invention.

[0054] As shown in FIG. 2(c), the head **400(a)** comprises a post **414** which may include a spring clip **414(a)**. The post **414** may be considered a stabilizing element. The post **414** may be inserted into the aperture in the lock interface member **402** as shown in FIG. 5(c). In this example, the aperture in the lock interface member **402** is in the form of the through aperture. At this point, balls **406** in the post **414** are retracted.

[0055] As shown in FIG. 2(d), a key (not shown) may be inserted into a keyway at the rear of the head **400(a)** and may then be turned. The turning of the key may cause the balls **406** to extend radially outward so that corresponding inner recesses **402(a)** in the lock interface member **402** are engaged by the balls **406**. The balls **406** may be characterized as engagement elements in some cases, and the recesses **402(a)** may be characterized as discrete engagement regions in other embodiments.

[0056] FIG. 2(e) is a partial cut away view showing balls **406** in inwardly facing recesses **402(a)** in the lock interface member **402(a)**. A spindle **408** can rotate and can cause the balls **406** to extend radially outward. As shown in FIG. 2(f), a terminal end of the spindle **408** may resemble a triangle with curved sides. The corners of the triangle may be considered raised portions and may push the balls **406** radially outward when the head **400(a)** transitions from an unlocked configuration to a locked configuration.

[0057] FIG. 2(g) shows a partial cut away view showing balls **406** withdrawn into recesses **408(a)** in the terminal end **408(b)** of the spindle **408**. As shown in FIG. 2(h), the balls **406** are in recesses **408(a)** at the terminal end of the spindle **408**. The head is thereafter in an unlocked configuration, and as shown in FIG. 2(h), the balls **406** do not contact engagement regions in the lock interface member **402**.

[0058] FIG. 2(i) shows an exploded view of the security apparatus shown in FIG. 2(b). In FIG. 2(i), a body **444** is cylindrically shaped, and has at least one aperture **444(a)**.

The aperture **444(a)** can align with aperture **410(a)** in the cable ring **410** and aperture **412(c)** in a spindle holder **412**. As in prior embodiments, the cable ring **410** has a ferrule holder **430** and a ferrule **432** attached to it.

[0059] The spindle holder **412** comprises a plate portion **412(a)**, which is shaped like a disk at end, and an apertured portion **412(b)** at another end. An axial passage **412(d)** runs axially through the spindle holder **412**.

[0060] Three balls **406** (e.g., steel ball bearings) may be sandwiched between the apertures in the apertured portion **412(b)** of the spindle holder **412** and a retainer clip **414(a)** having corresponding apertures. The apertures in the retaining clip **412** (or spring clip) and the apertured portion **412(b)** of the spindle holder **412** may radially overlap, and may have diameters that are smaller than the diameters of the balls **406**. The retaining clip **412** can flex or is resilient so that the balls **406** can extend radially outward or retract radially inward while being retained between the retaining clip **412** and the apertured portion **412(b)** in fixed axial positions.

[0061] The head in the security apparatus shown in FIG. 2(i) includes a locking mechanism which may comprise a first cylinder **420** and a second cylinder **422**. The first cylinder **420** and a second cylinder **422**, with other components, may form parts of a locking mechanism. The first cylinder **420** may include a first plurality of axial holes which may receive driver pins (not shown) and springs (not shown), while the second cylinder **422** may include a second plurality of axial holes in a rear portion **422(a)** which may receive key pins (not shown). The second cylinder **422** may also comprise a front portion **422(b)** which may have a smaller diameter than the rear portion **422(b)**. The second cylinder **422** may rotate relative to the first cylinder **420** when a key is inserted through a keyway at a rear of the second cylinder **422** and turned. The key pins may be driven inward different lengths by a key (not shown) with so that no pins lay across a shear line between the first cylinder **420** and the second cylinder **422**.

[0062] Another pin **424** passes through a radially extending hole **422(b)-1** and is inserted in hole **408(b)-1** in the spindle **408**, so that the spindle **408** is coupled to the second cylinder **422**. As shown, the spindle **408** includes a rear portion **408(b)** and a front portion **408(a)**. The rear portion **408(b)** engages the second cylinder **422**, while the front portion **408(a)** engages and manipulates balls **406**.

[0063] A lock interface member **402** is also shown in FIG. 2(i). The details of this particular lock interface member **402** are provided below.

[0064] Referring to FIG. 2(i), in use, a key (not shown) may be inserted into a keyway in the second cylinder **422**, and may be turned, for example, clockwise. The second cylinder **422(a)** can thereafter turn the spindle **408**, and the raised portions at the front portion **408(a)** of the spindle pushes the balls **406** radially outward to engage the lock interface member **402**. The balls **406** are held in fixed axial positions. The key is withdrawn and the head is thereafter in a locked configuration.

[0065] To unlock the head, the key is inserted into the keyway in the second cylinder **422** and may be turned, for example, counter clockwise. The spindle **408** may then turn, thereby causing the balls **406** to retract into recesses at the terminal end of the spindle **408**. Once the balls **406** retract, the balls **406** and therefore the head disengage from the lock interface member **402** and the head can be withdrawn from the lock interface member **402**.

[0066] FIGS. 2(k)-2(m) show different views of the previously described lock interface member **402**. Exemplary dimensions of the parts of the lock interface member **402** are shown in FIG. 2(k) in millimeters. As shown in FIG. 2(k), the lock interface member **402** comprises a tab **402(c)** attached (*e.g.*, integrally attached) to a ring **402(b)**. As shown in FIG. 2(l), the tab **402(c)** is oriented perpendicular to the ring **402(b)**, and has a hole **402(c)-1**. The ring **402(b)** has an inner rim **402(b)-2**, an outer edge portion **402(b)-1**, and an axially extending inner portion **402(b)-3**. The previously described balls can engage the rim **402(b)-2**, which may be a continuous, curved surface as shown in FIG. 2(l). In other embodiments, the rim may have a more abrupt surface. The rim **402(b)-2** may comprise a plurality of engagement regions, even though it is a continuous surface. FIG. 2(m) shows a perspective view of the lock interface member **402**.

[0067] Another embodiment of the invention is directed to a security apparatus comprising a head comprising a plurality of elongated engagement elements adapted to engage an aperture in a lock interface member in a portable electronic device. The security apparatus comprises a rotatable spindle comprising a plurality of bumps, and a locking mechanism. The bumps on the spindle are configured to push the elongated engagement elements radially outward when the spindle is rotated, and a security device attached to the head.

[0068] FIG. 3(a) shows an embodiment of the invention of this type. FIG. 3(a) shows a security apparatus **500** comprising a head **500(a)**. The head **500(a)** comprises a body **510**, a cable ring **526**, and an engagement arm housing **522** with a front portion **522(a)** which is cooperatively structured with an aperture **508(a)** in a wall **508** of a portable electronic device (not shown here, but shown in other Figures). These components may form a housing for the head **500(a)**. The engagement arm housing **522** houses four engagement arms **524(a)** which are spaced at regular radial positions (e.g., 12, 3, 6, and 9 o'clock). The engagement arms **524(a)** surround a front portion **518(b)** of a spindle, and may comprise flanges.

[0069] Referring to FIG. 3(b), a portion of the engagement arm housing **522** is inserted into the aperture **508(a)** of the wall **508** of the portable electronic device. The engagement arms **524(a)** are not yet radially extended and the head **500(a)** is in an unlocked configuration.

[0070] FIG. 3(c)-3(d) show the head **500(a)** after the head **500(a)** is changed to a locked configuration. The front portion **518(b)** of the spindle is rotated using a key (not shown), bumps **518(b)-1** on the engagement arms **524(a)** push the forward ends of the engagement arms **524** radially outward to engage the surface defining the aperture **508(a)** and the inner surface of the wall **508**. Each engagement arm **524** includes a flange that extends radially outward.

[0071] As shown in FIG. 3(d), the front portions of the engagement arms **524** extend radially outward when the head **500(a)** has a locked configuration. However, in the locked configuration, the rear portions of the engagement arms **524** have radially fixed positions in both the locked and unlocked configurations. The engagement arms **524** can be characterized as pivoting at their rear portions and may have separate pivot points. Pins **512(a)**, **512(b)** secure the body **510** to the engagement arm housing **522**.

[0072] FIG. 3(e) shows the head **500(a)** in an unlocked configuration. As shown, the engagement arms are positioned between the bumps **518(b)-1** so that they are retracted radially inward. The engagement arms **524** are no longer engaged with the wall of the portable electronic device, and the head **500(b)** can be separated from it.

[0073] FIG. 3(f) shows an exploded view of the previously described lock apparatus **500**. FIG. 3(f) shows a cylindrical body **510** comprising holes **512(a)**. Pins **512(a)**, **512(b)** secure the body **510** to the engagement arm housing **522**, which may be referred to as a collet housing in some cases. As described above, at least portions of the engagement arms **524** are

inside of the engagement arm housing **522**. Two retainer clips **520** are used to retain the ends of the engagement arms **524**.

[0074] A locking mechanism including a first cylinder **516** and a second cylinder **514** are disposed in the body **510**. The characteristics of the first and second cylinders **516**, **514** may be the same as the previously described first and second cylinders. In addition, the second cylinder has an elongated portion **514(b)** which couples to the rear portion **518(a)** of the spindle **518** using a pin **512(b)**.

[0075] As in prior embodiments, a ferrule holder **528** and a ferrule **530** are attached to the cable ring **526**. A snap ring **523** and an optional lock interface member **532** are also shown in FIG. 3(f). The lock interface member **532** may include or be in the form of a collar.

[0076] FIGS. 4(a)-4(c) are similar to FIGS. 4(a)-4(c), except that a lock interface member **534** is shown and used. The lock interface member **534** includes a ring **534(a)**, an inner rim, and a perpendicular tab **534(c)**. As shown, the flanges associated with the engagement arms **524** can engage the lock interface member **534**.

[0077] The lock interface member **534** comprises a ring portion **534(a)** including a rim **534(b)** which may be in the form of a continuous surface. A tab **534(c)** extends from the ring portion **534(a)** and is oriented perpendicular to the orientation of the ring portion **534(b)**. As in prior embodiments, the tab **534(c)** may be used to attach the lock interface member **534** to a structural component of the portable electronic device including the wall **599**.

[0078] Embodiments of the invention have a number of advantages. As shown above, some embodiments use a lock interface member which has multiple points of engagement with engagement elements in a locking head. This provides for a stronger connection between the locking head and a portable electronic device including the lock interface member. It also makes it more difficult to torque a head out of the interface member.

[0079] The above description is illustrative and is not restrictive. Many variations of the invention will become apparent to those skilled in the art upon review of the disclosure. The scope of the invention should, therefore, be determined not with reference to the above description, but instead should be determined with reference to the pending claims along with their full scope or equivalents.

[0080] One or more features from any embodiment may be combined with one or more features of any other embodiment without departing from the scope of the invention.

[0081] A recitation of "a", "an" or "the" is intended to mean "one or more" unless specifically indicated to the contrary.

[0082] All patents, patent applications, publications, and descriptions mentioned above are herein incorporated by reference in their entirety for all purposes. None is admitted to be prior art.

WHAT IS CLAIMED IS:

1. A security apparatus for use with a lock interface member comprising an aperture and engagement regions, the security apparatus comprising:

a head comprising a plurality of engagement elements adapted to engage the lock interface member via the engagement regions, wherein the engagement elements are capable of extending radially outward to engage the engagement regions; and

a security device coupled to the head.

2. The security apparatus of claim 1 wherein the engagement elements comprise balls.

3. The security apparatus of claim 1 wherein the head further comprises a retaining element comprising a retainer clip, and wherein the retainer clip holds the balls in a fixed axial position.

4. The security apparatus of claim 1 further comprising a spindle comprising recesses defined by raised portions, wherein the raised portions are configured to push the balls outward when the spindle is rotated to a locked position and wherein the recesses are configured to receive the balls when the spindle is rotated to an unlocked position.

5. The security apparatus of claim 1 further comprising a locking mechanism comprising a first cylinder and a second cylinder in the head, wherein the second cylinder is adapted to rotate relative to the first cylinder.

6. The security apparatus of claim 1 wherein the first and second cylinders comprise a plurality of axially extending holes in the first cylinder and the second cylinder, and pins in the axially extending holes.

7. The security apparatus of claim 1 wherein the head comprises a key locking mechanism.

8. A system comprising:

a portable electronic device comprising a lock interface member having an aperture and engagement regions; and

a security apparatus for use with the lock interface member, the security apparatus comprising a head comprising a plurality of engagement elements adapted to engage the lock interface member via the engagement regions, wherein the engagement elements are capable of extending radially outward to engage the engagement regions.

9. The system of claim 8 wherein the portable electronic device comprises a computer.

10. The system of claim 8 wherein the lock interface member is in the form of a collar.

11. The system of claim 8 wherein the engagement regions are recesses cooperatively structured with the engagement elements.

12. The system of claim 8 wherein the engagement elements comprise balls.

13. A method for securing a security apparatus of claim 1 to the lock interface member, the method comprising:

(a) inserting engagement elements into the aperture of the lock interface member; and

(b) pushing the engagement elements radially outward so that the engagement elements engage the lock interface member.

14. The method of claim 13 further comprising, turning a key and then pushing the engagement elements radially outward.

15. The method of claim 13 wherein the security device comprises a cable and a loop at an end of the cable, wherein the method further comprises:

wrapping the cable around an immovable object;

inserting the head into the loop; and

then performing (a) and (b).

16. A security apparatus comprising:

a head comprising a plurality of elongated engagement elements adapted to engage an aperture in a portable electronic device or in a lock interface member in the portable electronic device, a rotatable spindle comprising a plurality of bumps, and a locking mechanism, wherein the bumps on the spindle are configured to push the elongated engagement elements radially outward when the spindle is rotated; and

a security device attached to the head.

17. The security apparatus of claim 16 wherein the engagement elements comprise flanges at the ends of the engagement elements.

18. A system comprising:

a portable electronic device;

an aperture associated with the portable electronic device; and

a security apparatus comprising a head comprising a plurality of elongated engagement elements adapted to engage the aperture, a rotatable spindle comprising a plurality of bumps, and a locking mechanism, wherein the bumps on the spindle are configured to push the elongated engagement elements radially outward when the spindle is rotated.

19. The system of claim 18 wherein the security apparatus further comprises a cable coupled to the head.

20. The system of claim 18 wherein the cable comprises a loop at an end of the cable.

21. The system of claim 18 wherein the portable electronic device comprises a portable computer.

22. A method for using the security apparatus of claim 16, the method comprising:

(a) inserting the plurality of elongated engagement elements into the aperture;

(b) rotating the spindle;

(c) extending the elongated engagement elements radially outward; and

(d) locking the head.

23. The method of claim 22 wherein the method further comprises:

unlocking the head;

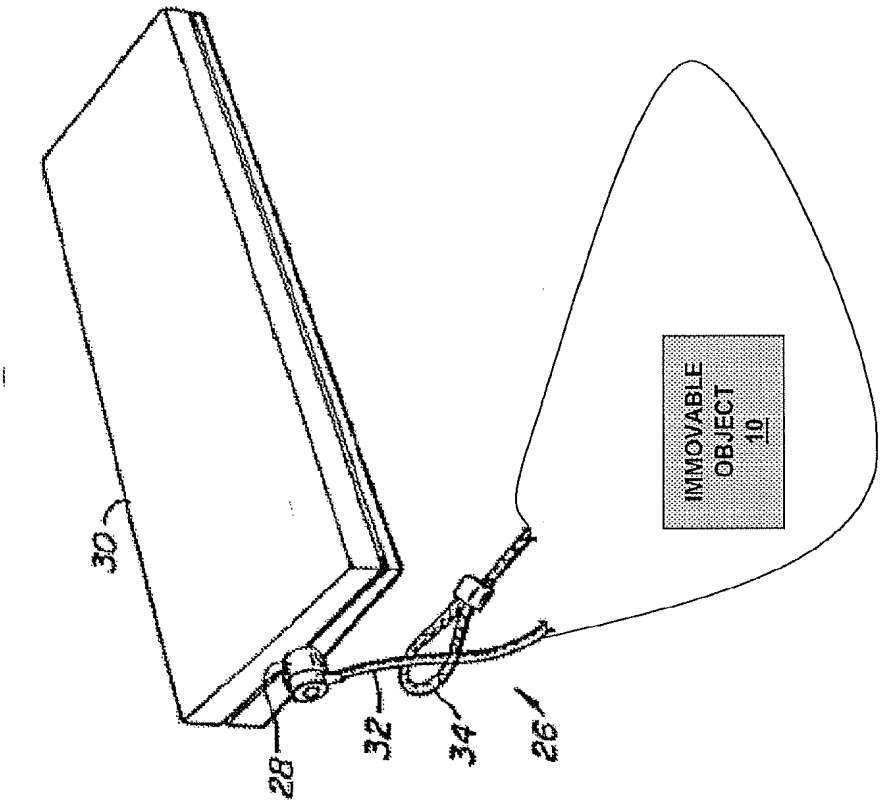
rotating the spindle in an opposite direction to the direction of rotation in (b);

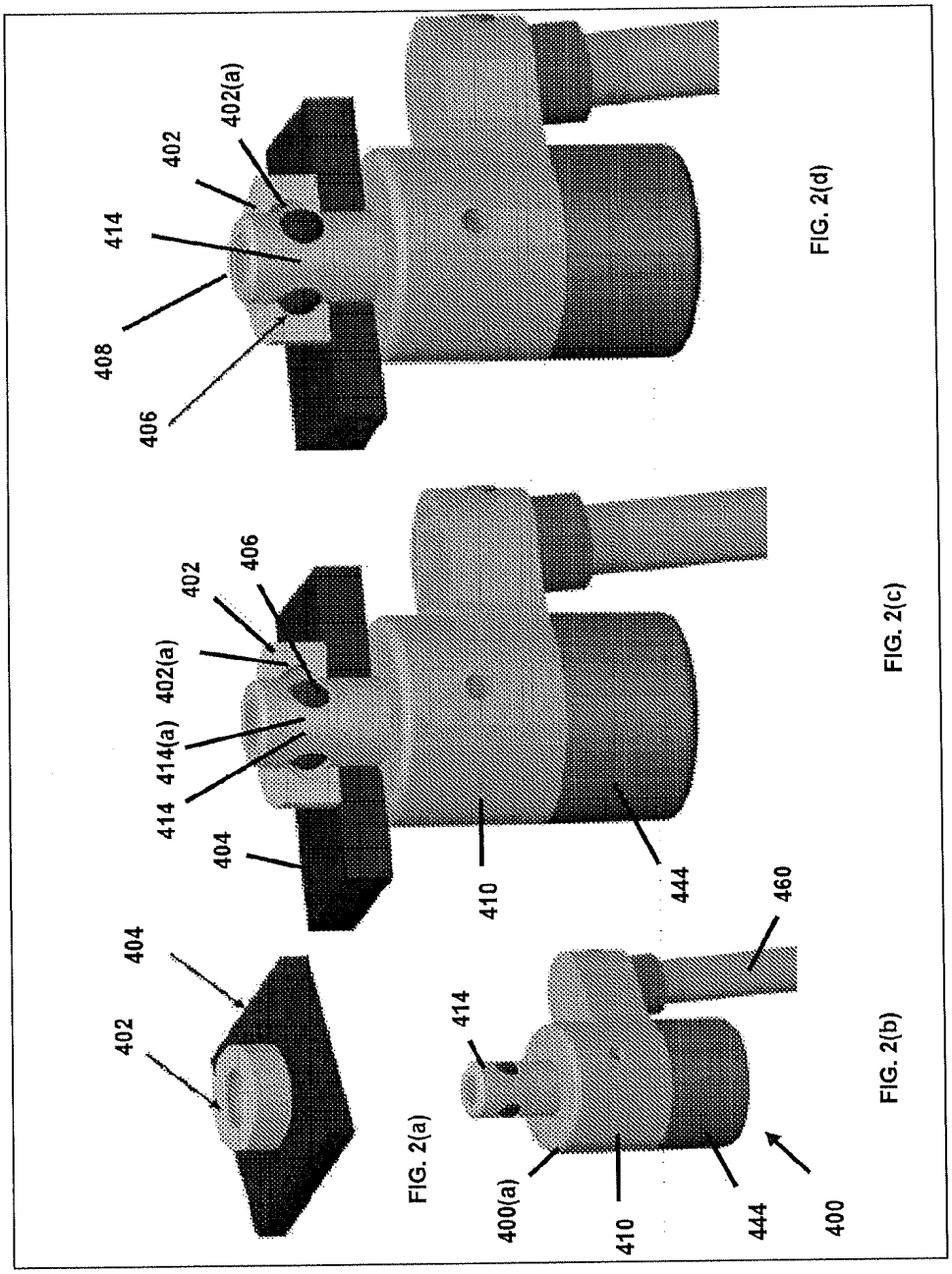
retracting the elongated engagement elements radially inward.

24. The method of claim 22 wherein the portable electronic device comprises a portable computer.

25. The method of claim 22 wherein the head comprises a key locking mechanism.

FIG. 1





Ex. 1002 - Page 770 of 997

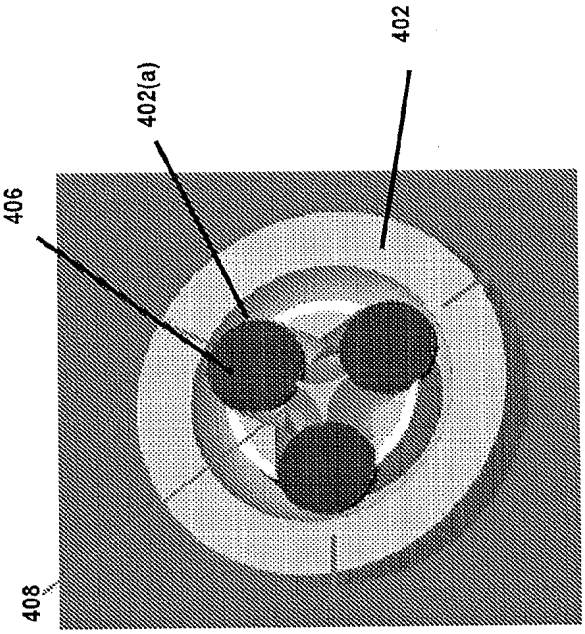


FIG. 2(f)

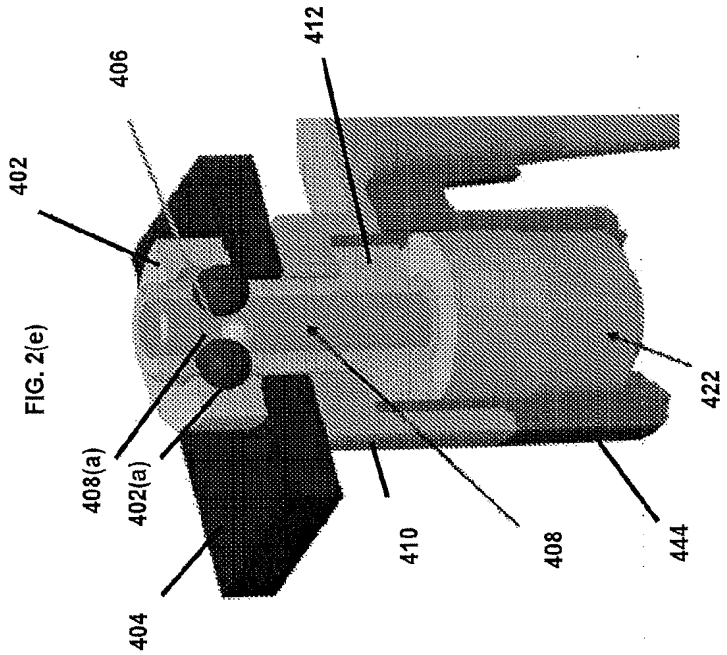


FIG. 2(e)

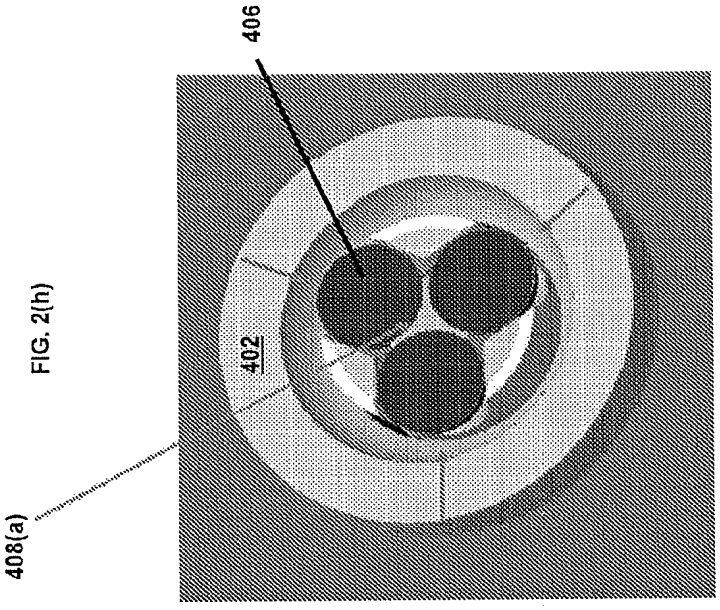


FIG. 2(h)

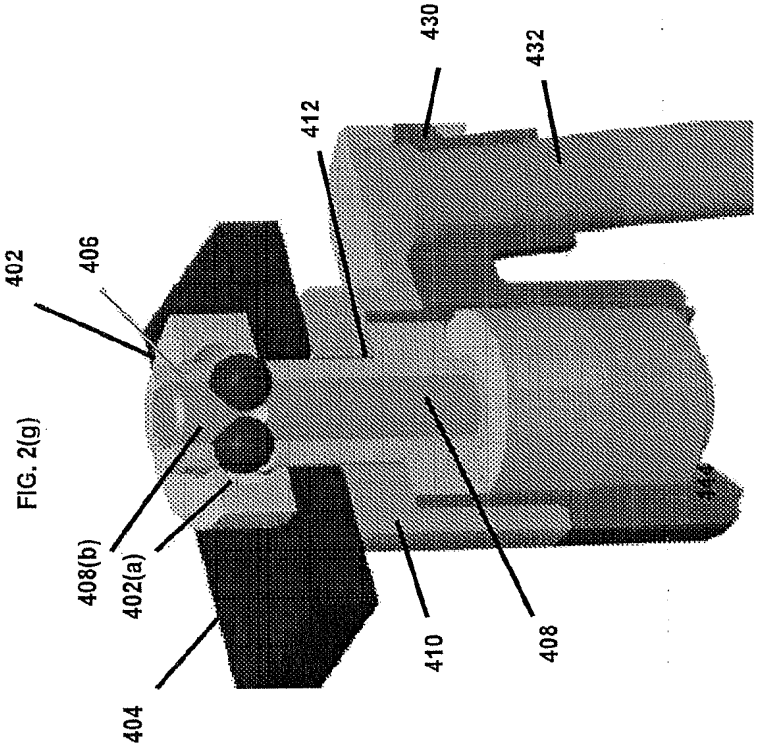


FIG. 2(g)

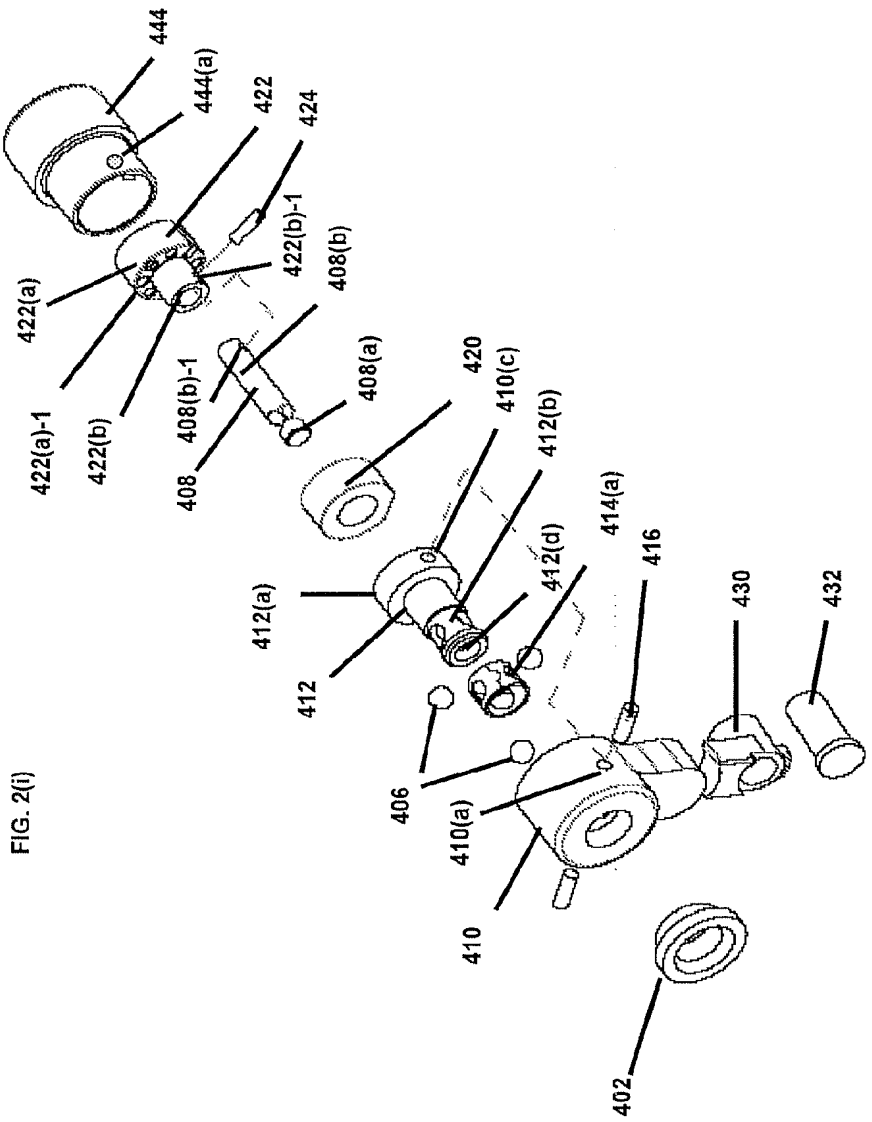

444
444(a)
422
424
422(b)-1
408(b)
422(a)
422(a)-1
422(b)
408(b)-1
408
408(a)
420
410(c)
412(b)
412(a)
412
412(d)
414(a)
416
430
432
406
410(a)
410
402

FIG. 2(i)

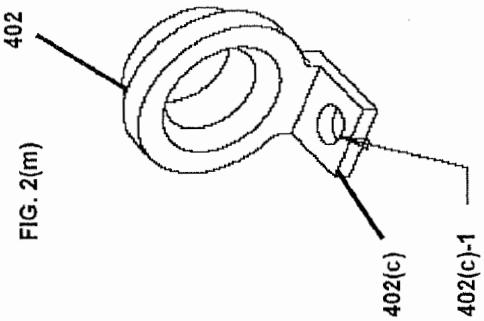


FIG. 2(m)

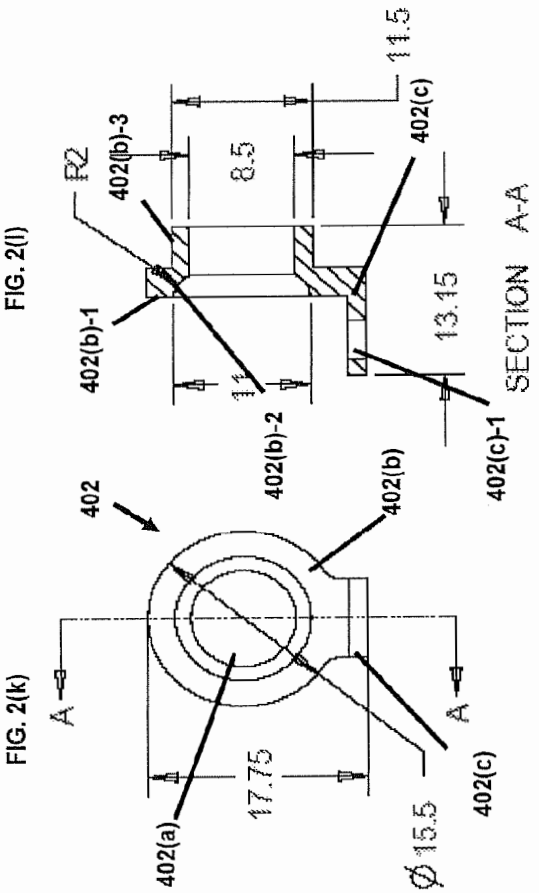


FIG. 2(l)

FIG. 2(k)

Ex. 1002 - Page 774 of 997

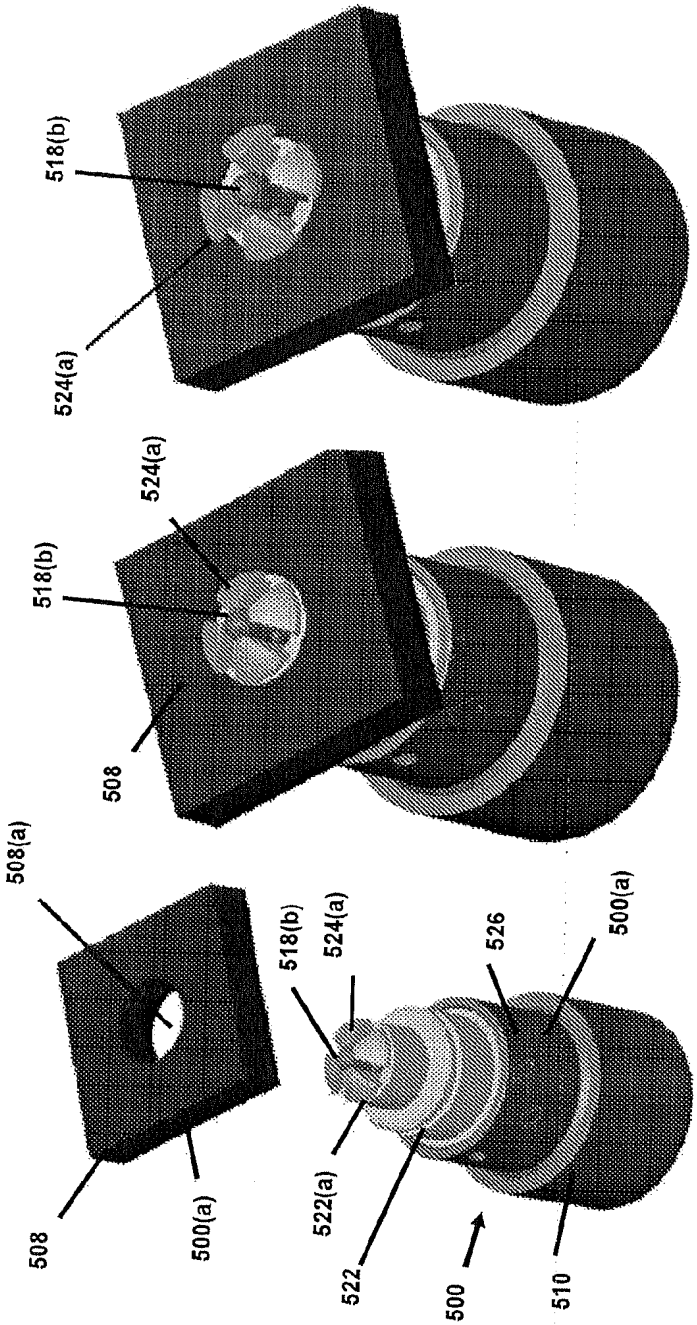


FIG. 3(c)

FIG. 3(b)

FIG. 3(a)

Ex. 1002 - Page 775 of 997

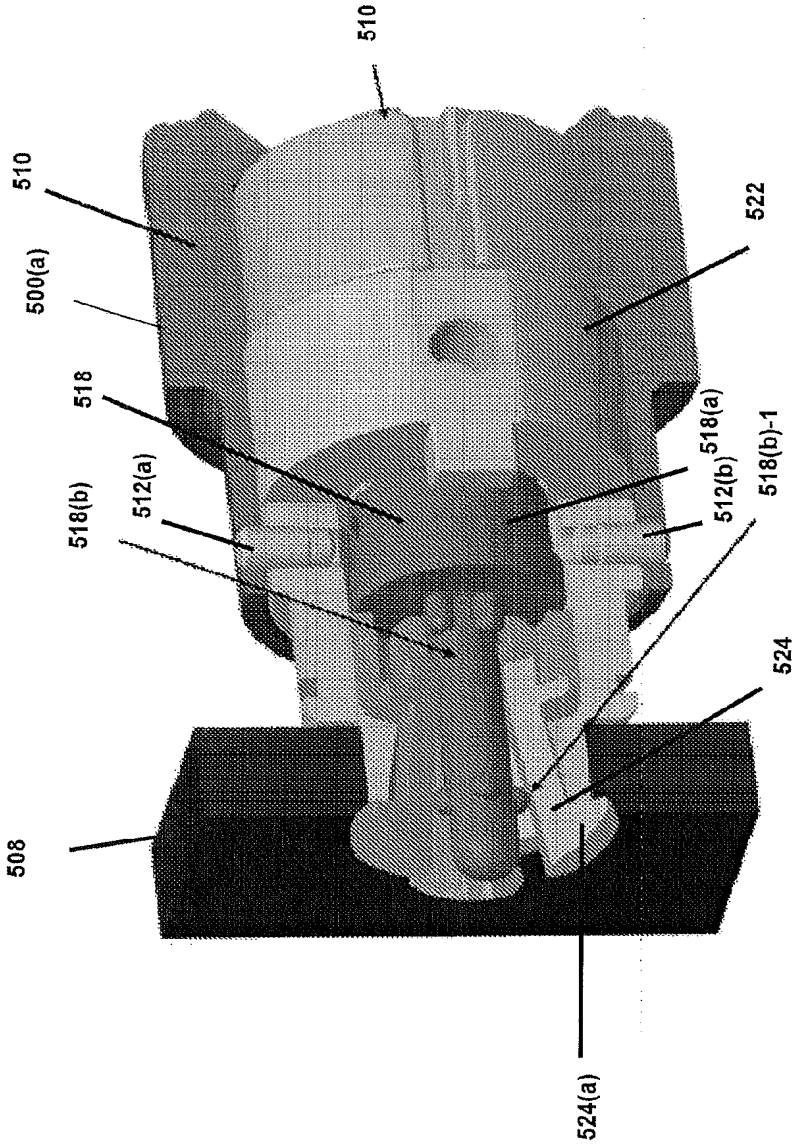


FIG. 3(d)

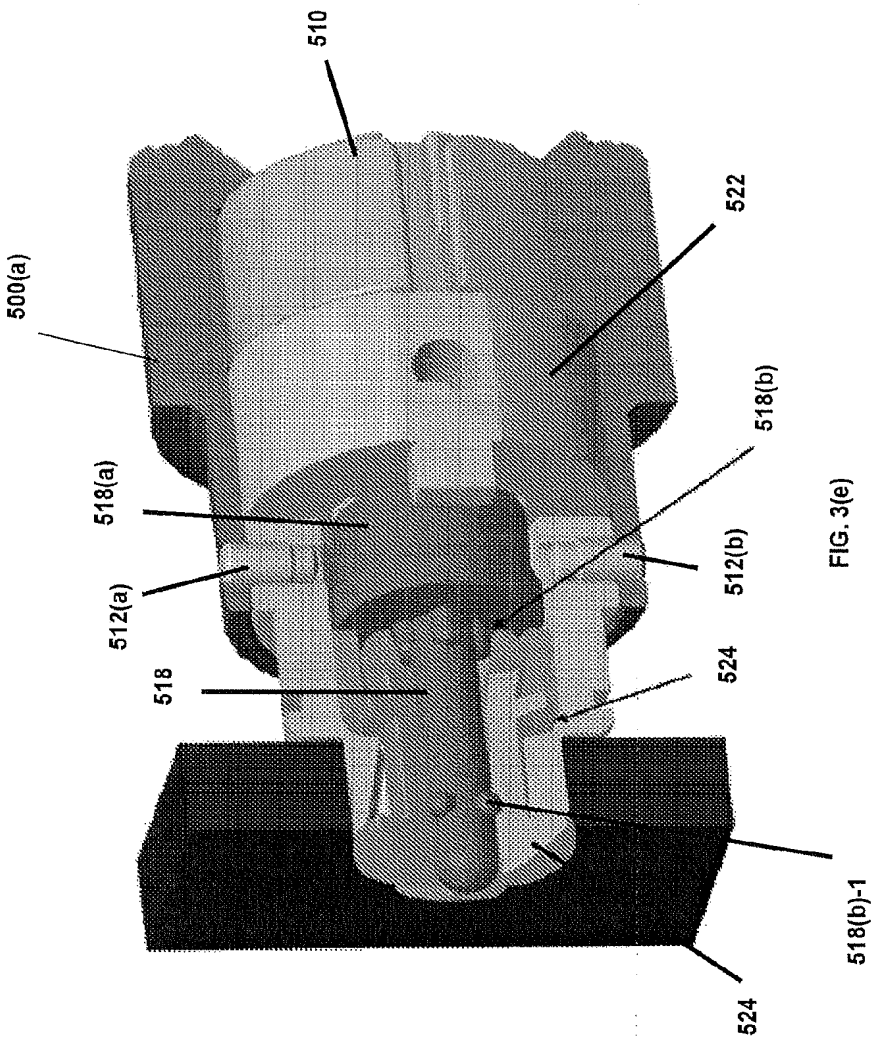


FIG. 3(e)

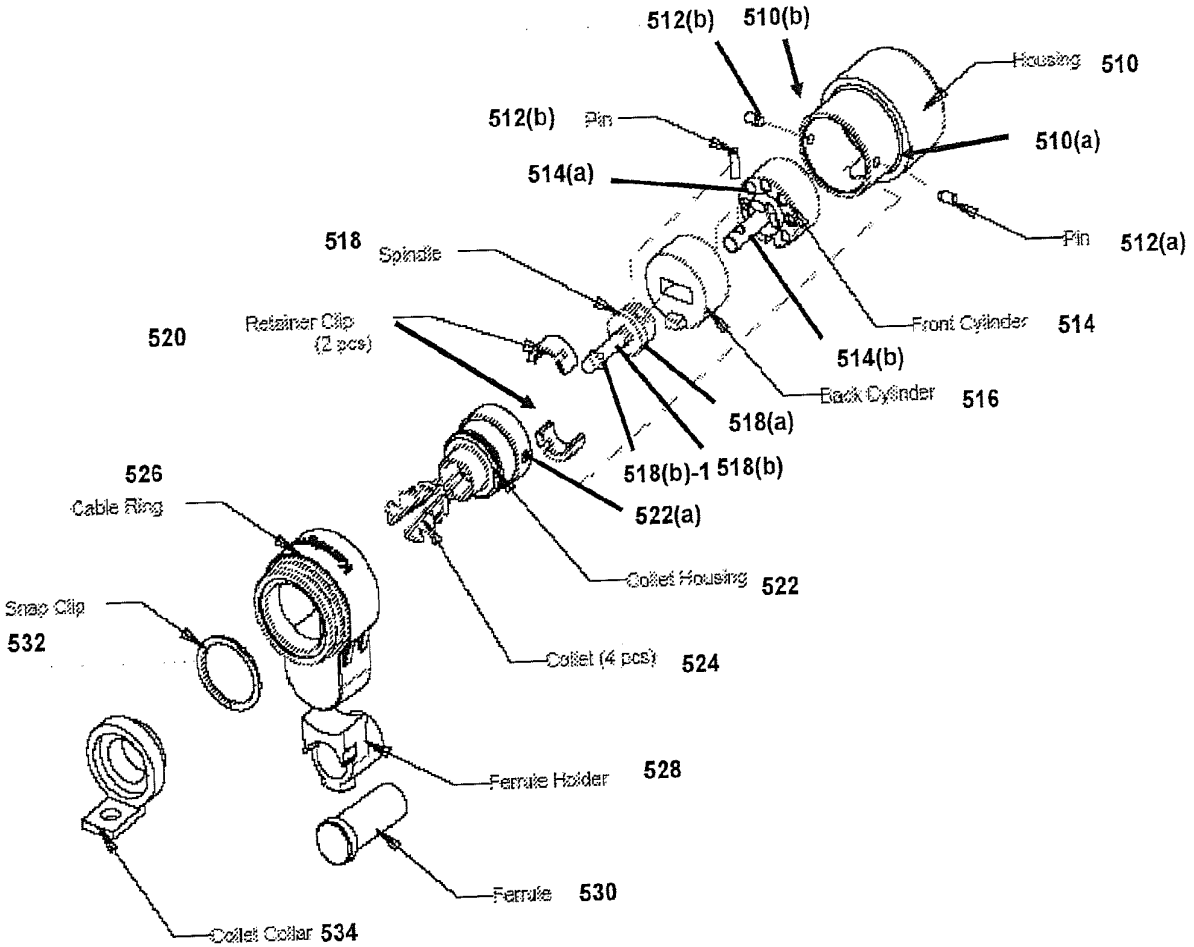

512(b)
510(b)
Housing 510
512(b) Pin
510(a)
514(a)
Pin 512(a)
518
Spindle
520
Retainer Clip (2 pcs)
Front Cylinder 514
514(b)
Back Cylinder 516
518(a)
518(b)-1
518(b)
526
Cable Ring
522(a)
Collet Housing 522
Snap Clip
532
Collet (4 pcs) 524
Ferrule Holder 528
Ferrule 530
Collet Collar 534

FIG. 3(f)

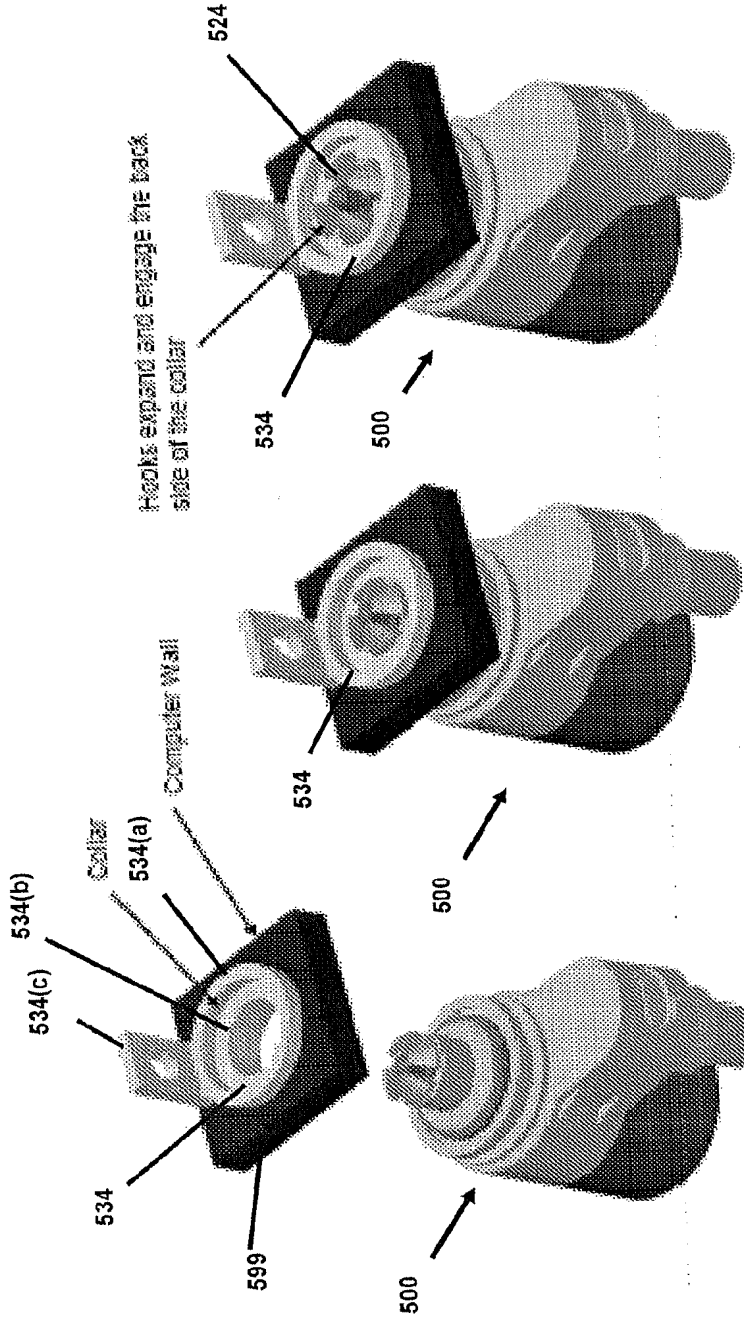


FIG. 4(a) FIG. 4(b) FIG. 4(c)

Unlocked Locked

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
4 December 2008 (04.12.2008)

PCT

(10) International Publication Number
WO 2008/147818 A1

(51) International Patent Classification:
E05B 65/48 (2006.01)

(21) International Application Number:
PCT/US2008/064382

(22) International Filing Date: 21 May 2008 (21.05.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/940,318 25 May 2007 (25.05.2007) US

(71) Applicant *(for all designated States except US)*: **ACCO BRANDS USA LLC** [US/US]; 300 Tower Parkway, Lincolnshire, Illinois 60069 (US).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **HUNG, John** [CA/CA]; 312 - 500 West 10th Avenue, Vancouver, British Columbia V5Z 4P1 (CA). **WHITE, Ryan** [US/US]; 709 Clayton Street, Apartment 3, San Francisco, California 94117-4055 (US).

(74) Agents: **JEWIK, Patrick R.** et al.; Townsend and Townsend and Crew LLP, Two Embarcadero Center, 8th Floor, San Francisco, California 94111 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL,

[Continued on next page]

(54) Title: SECURITY SYSTEM WITH LOCK INTERFACE MEMBER WITH MULTIPLE APERTURES

(57) Abstract: A system is disclosed. It includes a portable electronic device comprising a lock interface member having a first aperture configured to engage with a first security apparatus and a second aperture configured to engage with a second security apparatus. At least one of the first security apparatus and the second security apparatus is engaged with the lock interface member.

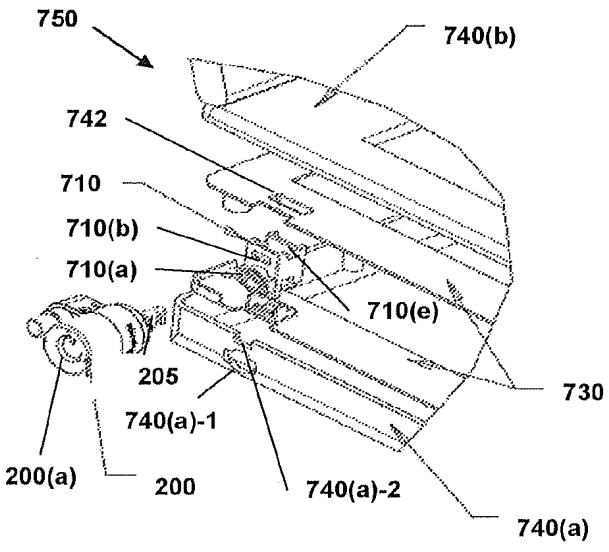


FIG. 2(a)

WO 2008/147818 A1

NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

SECURITY SYSTEM WITH LOCK INTERFACE MEMBER WITH MULTIPLE APERTURES

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application is a non-provisional of and claims the benefit of the filing date of U.S. Provisional Patent Application No. 60/940,318, filed on May 25, 2007, which is herein incorporated by reference in its entirety for all purposes.

BACKGROUND

[0002] Embodiments of the invention relate to devices for inhibiting the theft of relatively small but expensive pieces of equipment.

[0003] Computers have evolved rather rapidly from large, expensive machines usable only by a few, to relatively small, portable machines which are usable by many. In particular, the development of desk top computers with significant processing power has made computers available to the general population. It is now common for college and even high school students to have their own computer, and desk top computers are in wide spread use as word processors and work stations in almost all forms of business. Desk top computers are relatively small and easily transportable, and an undesirable side effect of their proliferation is the fact that the theft of such computers is a significant problem.

[0004] A variety of devices have been developed to inhibit the theft of desk top computers and similar equipment. Since desk top computer systems involve several components, typically including the computer itself, a separate monitor, keyboard and often a printer, such security systems often employ a cable which attaches each of the components to each other and to a relatively immovable object such as a desk. The principal difficulty in such systems is providing an effective and convenient method for attaching the cable itself to the equipment.

[0005] One way to address the problem of computer security is to provide a small, generally rectangular slot in a wall of a computer. A security apparatus with a locking head may be secured to the computer via the rectangular slot. While this solution is effective, improvements could be made. For example, although thieves are deterred from stealing

portable computers secured by conventional security mechanisms, in some cases, such thieves may be more interested in the data stored in the computers rather than the computers themselves. Accordingly, the damage that may occur to a computer that may occur during the theft of the computer may not deter a thief who wants the data stored inside of the computer. It would be desirable to improve the strength of the physical coupling between the security apparatus and the computer and so that it is more difficult for potential thieves to separate the security apparatus from the computer.

[0006] Some lock interface members and security apparatuses that provide for improved strength are described in U.S. Provisional Patent Application No. 60/853,888, filed on October 23, 2006. Some examples described in this application include a lock interface member that is used with a security apparatus comprising an engagement element having a particular configuration. In these examples, each lock interface member is generally configured to engage only one type of engagement element in a specific type of security apparatus. While such lock interface members and security apparatuses are effective, there may be some instances where a different user may have or want to use a different security apparatus for a portable electronic device. It would be desirable to provide for the ability to use different security apparatuses with a single portable electronic device.

[0007] Embodiments of the invention address these and other problems, individually and collectively.

BRIEF SUMMARY

[0008] Embodiments of the invention are directed to security apparatuses, systems, and methods for using such security apparatuses. Other embodiments of the invention may be directed to lock interface members and systems and methods incorporating such lock interface members.

[0009] One embodiment of the invention is directed to a system comprising: a portable electronic device comprising a lock interface member having a first aperture configured to engage with a first security apparatus and a second aperture configured to engage with a second security apparatus; and at least one of the first security apparatus and the second security apparatus engaged with the lock interface member.

[0010] Another embodiment of the invention is directed to a method comprising: obtaining a portable electronic device comprising a lock interface member having a first

aperture configured to engage with a first security apparatus and a second aperture configured to engage with a second security apparatus; inserting at least a portion of the first security apparatus into the first aperture; and securing the first security apparatus to the lock interface member via the first aperture.

[0011] Another embodiment of the invention is directed to a lock interface member comprising: a first aperture configured to engage with a first security apparatus; and a second aperture configured to engage with a second security apparatus.

[0012] These and other embodiments of the invention are described in further detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1 shows a perspective view of a portable electronic device and a security apparatus.

[0014] FIGS. 2(a)-2(b) respectively show an exploded view and a side cross-sectional view of a system according to an embodiment of the invention.

[0015] FIGS. 3(a)-3(g) shows various views of a lock interface member with first and second apertures. FIGS. 3(a)-3(c) respectively show a front, upper perspective view, a rear upper perspective view, and a lower front perspective view of a lock interface member according to an embodiment of the invention. FIGS. 3(d)-3(g) respectively show a side cross-section view, a front elevation view, a top plan view, and a bottom plan view of a lock interface member according to an embodiment of the invention.

[0016] FIG. 4(a) shows a front, perspective view of a portion of a security apparatus that can engage a first aperture in a lock interface member.

[0017] FIG. 4(b) shows an exploded view of the security apparatus shown in FIG. 4(a).

[0018] FIG. 5 shows a perspective view of another security apparatus that can engage a second aperture in a lock interface member.

[0019] FIG. 6 shows an exploded view of the security apparatus in FIG. 5.

[0020] FIG. 7 shows a side, cross-sectional view of another security appartus according to an embodiment of the invention.

[0021] In the Figures, like numerals designate like elements.

DETAILED DESCRIPTION

[0022] Embodiments of the invention include systems, methods, and lock interface members. In embodiments of the invention, reference is made to "first" and "second" apertures in a lock interface member, and "first" and "second" security apparatuses. It is understood that embodiments of the invention may include more than two apertures or more than two security apparatuses.

[0023] As used herein, in the above described embodiments and in other embodiments, an "aperture" may include a blind aperture or a through aperture. A through aperture may be in the form of a hole, or a recess.

[0024] One embodiment of the invention is directed to a system including a portable electronic device including a lock interface member having a first aperture configured to engage with a first security apparatus and a second aperture configured to engage with a second security apparatus. At least one of the first security apparatus and the second security apparatus is engaged with the lock interface member.

[0025] The lock interface member may be an attachment that may be attached to the housing of the portable electronic device, or it may be integrally formed in the housing or other component of the portable electronic device. For example, in some embodiments, the lock interface member may be integrally formed with, or operatively or physically coupled to the chassis of the portable electronic device and/or may be operatively or electrically coupled to some electrical component in the portable electronic device. In addition, if the lock interface member is a separate component from the wall of the portable electronic device, the lock interface member may be positioned within an aperture formed in a wall of the portable electronic device, or inside of the portable electronic device. Exemplary lock interface members are described in further detail below. Further, the lock interface members can be made of any suitable material including plastic, steel, or nickel alloys.

[0026] The first and second apertures can have first and second configurations, where the first and second configurations are different. First and second engagement elements in the first and second security apparatuses may also have different configurations so that they can respectively engage the first and second apertures. For example, the first aperture may be defined by one or more protrusions in an aperture wall, while the second aperture may be a

substantially rectangular slot without protrusions. The first security apparatus may have an engagement element with recesses that are cooperatively configured to be received by the protrusions associated with the first aperture. The second apparatus may have an engagement element which is in the form of a T-bar with a shaft and a cross-member. The cross-member may be rotatable so that it can pass through the second aperture when it is aligned with the second aperture. It can then be rotated about 90 degrees so that it is not aligned with the second aperture and thereafter engages the lock interface member via the second aperture.

[0027] In some embodiments of the invention, the first engagement element associated with the first security apparatus can engage the lock interface member via the first aperture, but cannot engage the lock interface member via the second aperture. Also, in such embodiments, the second security apparatus can engage the lock interface member via the second aperture, but cannot engage the lock interface member via the first aperture. The first aperture and the second aperture may be sufficiently close together so that only one type of security apparatus can be used at a time.

[0028] In embodiments of the invention, the lock interface member can engage only one of the first and the second security apparatuses, or can engage both of the first and second security apparatuses simultaneously. In this way, at least two different types of security apparatuses can be used with the lock interface member to secure a portable electronic device. If a user only has a security apparatus that is like the first security apparatus, then the user can use the first security apparatus to secure the portable electronic device. If the user only has a security apparatus like the second security apparatus, then the user can use the second security apparatus to secure the portable electronic device.

[0029] Also, in some embodiments of the invention, the first and second apertures are only used to interface with physical security apparatuses and to prevent the unauthorized taking and/or use of the portable electronic device. For example, the first and second apertures are typically not used to provide any function for normal operation of the portable electronic device. In some embodiments, electronics that may disable the portable electronic device may be associated with the first and/or second apertures in the lock interface member. If, for example, the first security apparatus is used to secure a portable electronic device via a first aperture in a lock interface member, the unauthorized removal of the security apparatus may disable the portable electronic device.

[0030] Embodiments of the invention provide for a number of advantages. For example, a user of a portable electronic device including a lock interface member with at least a first and a second aperture may use many different types of security apparatuses to secure the portable electronic device to an immovable object. The user is not restricted to the use of one type of security apparatus with only one type of engagement element. If, for example, the first aperture in the lock interface member may be adapted to interface with an older security apparatus and the second aperture in the lock interface member may be adapted to interface with a newer security apparatus. If the user decides to upgrade from the older security apparatus to the newer security apparatus, the newer security apparatus can still be used to secure the portable electronic device to an immovable object.

[0031] In addition, by using a lock interface member, the strength of the coupling between at least one of the first and the second security apparatuses and the lock interface member can be increased over a conventional physical security system including a portable electronic device comprising a conventional security slot and a physical security apparatus secured to the portable electronic device via the security slot. A conventional security system such as this can withstand 150 lbs of force, because the plastic housing of the portable consumer device can fail or break when this magnitude of force is applied. Also, current locks on the market are designed to withstand 300 lbs of force before they are broken. Improved security apparatuses and systems are therefore desirable.

[0032] In some embodiments of the invention, the strength of the coupling between the security apparatus and the portable electronic device may be increased by at least 2, 6, or even 8 times compared to conventional systems. For example, by using embodiments of the invention, it may take more than about 300 lbs of force, or even more than about 500, 1000, or 2000 lbs of force to break the physical coupling between the head in a security apparatus and the portable electronic device to which it is secured. As shown below, the lock interface members of some security apparatuses and the corresponding engagement elements and stabilizing elements are cooperatively structured with each other, and have more contact area than conventional security systems. The engagement elements and the stabilizing elements are also stronger than conventional elements in conventional locks. Accordingly, embodiments of the invention are stronger and therefore more effective at deterring and preventing the theft of portable electronic devices than conventional security systems.

[0033] Exemplary security apparatuses are described in detail below. The security apparatuses may comprise a head and a security device. The head and the security device may be physically and/or operationally coupled together.

[0034] In an embodiment of the invention, the security device may comprise a cable, or some other type of device to provide security. If the security device comprises a cable, then the cable may be secured to an immovable object such as a desk or cabinet so that a portable electronic device coupled to the cable cannot be removed. The cable may comprise stainless steel, Kevlar®, or some other type of strong material.

[0035] In another embodiment, the security device may comprise a wireless device such as a wireless transmitter and/or receiver. The wireless device may be used in a proximity detection system or a motion detection system. For example, a motion detector could be present in the wireless device so that when the motion detector moves, an associated alarm is triggered. The alarm may be in the security device or may be external to the security device. In another embodiment, there may be a base device associated with the wireless device, and these components may be used in a proximity detection system. Wireless signals may be transmitted between the security device and the base device, and when these devices are separated by a predetermined distance, an associated alarm (e.g., an audible alarm) may be triggered. The alarm could be in the base device or in the security device. The electronics associated with such wireless systems are known to those of ordinary skill in the art.

[0036] The security apparatus may comprise a head. The head in the security apparatus may be a locking head. A locking head according to an embodiment of the invention may comprise a locking mechanism such as a key locking mechanism or a combination locking mechanism disposed within it. Various types of locking heads are described in further detail below.

[0037] The portable electronic device that is to be secured may comprise any suitable device. Examples of such devices comprise portable computers such laptop, desktop, and server computers, flat panel televisions, projectors, monitors, portable music players, printers, external hard-drives, cell phones, etc.

[0038] FIG. 1 shows a system comprising a portable electronic device **30** and a security apparatus **26** that is used to secure the portable electronic device **30** to an immovable object **10** such as a desk leg or the like. The security apparatus **26** comprises a head **28** and a cable **32** coupled to the head **28**, which may be a locking head in this example. A loop **34** is

at a terminal end of the head **28**. The cable **32** may comprise a strong material such as stainless steel or Kevlar™.

[0039] To secure the portable electronic device **30** to the immovable object, the cable **32** may be wrapped around the immovable object and the head **28** may pass through the loop **34**. An engagement element in the head **28** may then be inserted into an aperture in the portable electronic device **30**, or in an aperture in a lock interface member that is associated with the portable electronic device **30**. A stabilizing element may then be inserted into the aperture in the lock interface member to stabilize the head **28** so that the engagement element cannot be readily withdrawn from the aperture. A locking mechanism such as a key locking mechanism or a combination locking mechanism may be used to keep the stabilizing element and/or the engagement element from moving or not moving. In other embodiments, the stabilizing element may first be inserted into the aperture in the lock interface member, and/or an aperture in the portable electronic device, and the engagement element may thereafter be inserted therein to engage the aperture in the portable electronic device or in the lock interface member.

[0040] FIG. 2(a) is an exploded view of a system according to an embodiment of the invention. The system includes a portable electronic device **750** including internal computer chassis portions **730** sandwiched between external plastic chassis portions **740(a)**, **740(b)**. A lock interface member **710** may be attached to, or integrally formed with, internal computer chassis portions **730** and/or external plastic chassis portions **740(a)**, **740(b)**. The lock interface member **710** comprises a first aperture **710(a)** and a second aperture **710(b)** spaced from the first aperture **710(a)**. A hole **740(a)-1** may be in the bottom external chassis portion **740(a)** and may align with the first aperture **710(a)** in the lock interface member **710**. A second hole **742** in an upper internal chassis portion **730** can receive a rear portion **710(e)** of the lock interface member **710** and can secure the lock interface member **710** thereto.

[0041] A first security apparatus **200** (which may have a similar configuration as the security apparatus in FIG. 4(a)) may interface with the first aperture **710(a)** in the lock interface member **710**. The first security apparatus **200** may comprise a head **200(a)** comprising an elongated engagement element **205** at one end and a keyway at the other end. Further details regarding the first security apparatus **200** and other security apparatuses are provided below.

[0042] As shown in FIG. 2(b), in use, an engagement element **205** in the first security apparatus **200** can be inserted into the lock interface member **710** and can pass through the second aperture **710(b)** in the lock interface member **710** and the hole **740(a)-1** in the bottom external chassis portion **740(a)** when it is aligned with them. The elongated engagement element **205** can be removable from the second aperture **710(b)** when the security apparatus **200** is in an unlocked configuration, and may not be removable when the security apparatus **200** is in a locked configuration. Stabilizing elements (e.g., pins), which are not shown in FIGS. 2(a)-2(b), may also extend axially outward in the same direction as the engagement element **205**. The stabilizing elements may be used to secure the security apparatus **200** to the portable electronic device **750** when the engagement element **205** is in a locked configuration, so that the security device **200** cannot be separated from the portable electronic device **750**.

[0043] As shown in FIG. 2(b), the first security apparatus **200** may comprise an engagement element **205** that has recesses that engage inward protrusions **710(h)** in the first aperture **710(a)** in the lock interface member **710**. The security apparatus **200** may also include a cable (not shown) so that the security apparatus **200** can secure the portable electronic device **750** to some other object.

[0044] FIGS. 3(a)-3(g) shows various views of a lock interface member with first and second apertures.

[0045] FIGS. 3(a)-3(b) show a lock interface member **710** comprising a body **710(c)** comprising a first aperture **710(a)** and a second aperture **710(b)**. The first aperture **710(a)** may be cooperatively structured to receive an engagement element associated with one type of security apparatus, while the second aperture **710(b)** may be configured to receive an engagement element of another type of security apparatus. The lock interface member **710** also comprises a front portion **710(d)** and a rear portion **710(e)** (in the form of vertical walls).

[0046] Referring to FIG. 3(d), the first aperture **710(a)** may comprise axial protrusions **710(h)** and stabilizing element receiving recesses **710(g)**. As shown in FIG. 3(f), the first aperture **710(a)** may have a circular shape with radially extending recesses **710(b)**. Also, the second aperture **710(b)** has a different configuration than the first aperture **710(a)**. For example, in this example, the second aperture **710(b)** may be in the form of a generally rectangular slot that has dimensions of about 3 mm by about 7 mm. It may engage security apparatuses like those described in U.S. Patent No. 6,006,557, which is herein incorporated in

its entirety for all purposes. By using at least two different apertures configured to receive at least two different security apparatuses, embodiments of the invention can be adapted to attach to different types of security apparatuses.

[0047] FIG. 4(a) shows a front perspective view of an exemplary first security apparatus **200** according to an embodiment of the invention. The first security apparatus **200** comprises a head **200(a)** comprising a body **214** attached to a cable ring **218**. A ferrule holder **209** and a ferrule **210** are attached to the cable ring **218**.

[0048] The security apparatus **200** comprises an engagement element **205** that is rotatable and comprises a number of cross-members **204(a)** and depressions **204(b)** formed between the cross-members **204(a)**. The engagement element **205** may also be characterized as having alternating wider cross-member portions and narrower axial shaft portions. Two stabilizing elements **202(a)** are on opposite sides of the engagement element **205**. The two stabilizing elements **202(a)** are in the form of stationary pins in this embodiment. In other embodiments, the stabilizing elements **202(a)** may be retractable or otherwise movable, and the corresponding engagement element may or may not be movable.

[0049] FIG. 4(b) shows an exploded view of the first security apparatus **200** shown in FIG. 4(a). FIG. 4(b) shows a body **214** in the form of a cylinder. The body **214** is coupled to an abutment structure **202** via pins **216(a)**, **216(b)**. The pins **216(a)**, **216(b)** pass through holes **214(a)**, **214(b)** in the body **214**, and holes in the abutment structure **202** (one of which is hole **202(c)**). The abutment structure **202**, in this example, comprises a cylindrical structure **202(d)** with stabilizing elements **202(a)**, **202(b)** in the form of pins extending axially from the cylindrical structure **202(d)**.

[0050] A locking mechanism comprising a first fixed cylinder **210** and a second rotatable cylinder **212** are inside of the body **214**. The first fixed cylinder **210** comprises a plurality of axially extending holes **210(a)** surrounding a central hole **210(b)**. Likewise, the second cylinder **212(b)** comprises a plurality of axially extending holes **212(a)** around another central hole **212(b)**.

[0051] A locking spindle **204** passes through the central hole **210(b)** in the first fixed cylinder **210** and is engaged with the second cylinder **212** via its central hole **212(b)** at its rear end **204(d)**. The locking spindle **204** also includes a central portion **204(c)** and a front portion which may form the engagement element **205**. The engagement element **205** may comprise cross-members **204(a)** and depressions **204(b)** as discussed previously. A snap ring

219, a ferrule holder **209**, and a cable ferrule **210** are attached to the cable ring **218** via an extending portion **218(b)**. A hole **218(a)** is in the cable ring **218**.

[0052] Referring to FIGS. 3 and 4(a)-4(b), in operation, the engagement element **205** and the stabilizing elements **202(a)**, **202(b)** are inserted into the first aperture **710(a)** in the lock interface member **710**. As shown in FIG. 3(f), the first aperture **710(a)** of the lock interface member **206** may have lateral ends which are somewhat rectangularly shaped, and a central portion which has upper and lower curved portions. The rectangularly shaped portions are cooperatively structured with the stabilizing elements **202(a)**, **202(b)** and may receive them. The rectangular shaped portions may include generally straight sides. After the stabilizing elements **202(a)**, **202(b)**, and the engagement element **205** are inserted into the interface member **710**, a key (not shown) is inserted into the rear keyway in the head **200(a)**. The key is then turned and this in turn rotates the engagement element **205** clockwise (or counterclockwise).

[0053] Referring to FIGS. 3 and 4(a), the rotation of the engagement element **205** causes the cross-members **204(a)** to fill depressions inside of the lock interface member **710**. It also causes the protrusions **710(h)** inside of the lock interface member **710** to fill depressions between the cross-members **204(a)**. The engagement element **205** is therefore strongly interlocked with the lock interface member **710** so that the head **200(a)** cannot be separated from the lock interface member **710** and cannot be separated from the portable electronic device **760**.

[0054] FIG. 5 shows a perspective view of an exemplary second security apparatus including an attachment mechanism **28** in the form of a locking head, and FIG. 6 shows an exploded view thereof. Attachment mechanism **28** includes a hollow shell **92** and a nose-piece **92** which, in combination, form a housing. Shell **90** has a hollow cylindrical interior cavity **94**, and an integral apertured plate **96** at one end. A pin **98** is inserted through an aperture (not shown) in nose-piece **92** to engage a slot **102** in shell **90**. Pin **98** is designed to shear when torque is applied to nose-piece **92** so that an unauthorized attempt to remove the attachment mechanism will simply shear the pin and allow the nose-piece to freely rotate without degrading the attachment of the attachment mechanism to the component to be protected. Slot **102** is axially elongate so that limited axial movement is allowed between shell **90** and nose-piece **92**. The forward end of nose-piece **92** has a plate **93** having a central aperture **95**.

Ex. 1002 - Page 792 of 997

[0055] A cylindrical collar **106** circumscribes the outer portion of shell **90** and occupies the slot laterally defined by plate **96** and the aft surface **108** of nose-piece **92**. Collar **106** has an integral tab **110** with an aperture **112** adapted to receive one end of cable **32**. Cable **32** is dead-ended into tab **110** and attached so that it cannot be removed.

[0056] A spindle **114** has a cylindrical portion **116** adapted to be received within a cylindrical lock **118** in shell **90**. Cylindrical lock **118** includes a front cylinder **119**, and a back cylinder **120**. A blunt pin or set screw **121** is inserted through an aperture **125** in shell **90**, and through a corresponding aperture **123** in back cylinder **120**, to lock the front cylinder rotationally with respect to shell **90**. Correspondingly, pin or set screw **127** engages a relatively smaller aperture **129** in front cylinder **119**, and a widening **131** in slot **133** in the cylindrical portion **116** of spindle **114**. Front cylinder **119** is thus fixed rotationally with respect to spindle **114**.

[0057] As with conventional cylindrical locks, a plurality of pins normally span the interface between front cylinder **119** and back cylinder **120** so that the cylinders are rotationally locked together, thus preventing relative rotation between locking shell **90** and spindle **114**. However, a key (not shown) is insertable through the apertured plate **96** of shell **90** to engage front cylinder **119**. The correct key can have bosses located to depress the pins passing between cylinders **119** and **120** so that such pins do not span the interface between the cylinders, allowing the cylinders to rotate with respect to one another. In this fashion, spindle **114** can be rotated with respect to shell **90** only upon insertion and rotation of the appropriate key.

[0058] Spindle **114** also includes a shaft **122**, and a crossmember **124** at the free end of the shaft. An abutment mechanism **126** has an abutment plate **128** adapted to fit within nose-piece **92**, and a pair of pins **130** adapted to extend outwardly through aperture **95**. A spring **132** is located between abutment plate **128** and nose-piece **92** to bias the cylindrical portion **116** of spindle **114** and the abutment plate rearwardly. Abutment plate **126** has an elongate aperture **134** which allows crossmember **124** to extend through the aperture plate. A plastic bushing **136** is fixed to the surface of plate **93** so that the mechanism does not scar the equipment to which it is attached.

[0059] Referring to FIGS. 3 and 5, the operation of the second security apparatus can be described. The shaft **122** and the crossmember **124** can be rotated so that the crossmember **124** is aligned with the pins **130**. At this point, the crossmember **124** and the pins **130** can be

inserted into the second aperture **710(b)** in the lock interface member **710**. The cross-member **124** then lies past an internal wall of the lock interface member **710**. The crossmember **124** can then be rotated so that it is no longer aligned with the second aperture **710(b)** and the pins **130**. At this point, the second security apparatus is then secured to the lock interface member **710** and therefore to the portable electronic device including the lock interface member **710**.

[0060] It is understood that the first and second security apparatuses described above are examples, and that other types of security apparatuses and lock interface member apertures can be used in embodiments of the invention. For example, FIG. 7 shows another example of an aperture in a lock interface member and another example of a security apparatus that works with the aperture. This aperture/security apparatus combination could be used instead of or in addition to the previously described first aperture/first security apparatus or second aperture/second security apparatus combination.

[0061] As noted above, FIG. 7 shows a cross-sectional view of another system including a security apparatus **600** and the lock interface member **610**. FIG. 7 shows the shape of a protrusion **610(c)** and an engagement element **602**. As shown, the protrusion **610(c)** has a sloped surface **610(c)-1** which can interface with a corresponding sloped surface **602(a)-1** on the protrusion **602(a)** on the engagement element **602**. The sloped surface **610(c)-1** and the sloped surface **602(a)-1** may form a 45 degree angle (or more or less than this) with the axis of the engagement element **602**. The protrusion **610(c)** fits into a gap **602(e)** defined by the outer surface of the engagement element **602**. It is understood that although a protrusion **610(c)** with a sloped surface **610(c)-1** is shown in the security system in FIG. 8(d), this feature may be used in any of the previously described embodiments as well. In other embodiments, the surfaces **610(c)-1** and **602(a)-1** need not be sloped, but could be perpendicular to the axis of the engagement element **602**.

[0062] The engaged, opposing sloped surfaces **610(c)-1**, **602(a)-1** improve the strength of the bond between the security apparatus **600** and the lock interface member **610**. For example, if one tries to disengage the security apparatus **600** and the lock interface member **610** by pulling the security apparatus **600** in the direction F2, the engaged, opposing sloped surfaces **610(c)-1**, **602(a)-1** cause any force to be applied to the lock engagement member **610** in a radial direction (e.g., in the direction F1) as well as in an axial direction (e.g., in the direction F1). Since there is a plurality of such slanted surfaces on corresponding

lobe/protrusion pairs, any pulling forces can be evenly distributed around the engagement element **602**. If the protrusion **610(c)** had a flat surface perpendicular to the axis of the engagement element **602**, then the protrusion **610(c)** would bear substantially all of the force applied in the axial direction (e.g., direction F2), thereby subjecting protrusion **610(c)** to a greater amount of force and increasing the likelihood that protruding portion **610(c)** might break.

[0063] The particular security apparatus/aperture configuration shown in FIG. 7 is advantageous, as it is stronger than conventional security apparatus/aperture combinations. This is explained in detail in PCT/US07/82113, filed on October 22, 2007, which is herein incorporated by reference in its entirety for all purposes.

[0064] Some embodiments of the invention are also directed to methods of use. One embodiment includes obtaining a portable electronic device comprising a lock interface member having a first aperture configured to engage with a first security apparatus and a second aperture configured to engage with a second security apparatus, inserting at least a portion of the first security apparatus into the first aperture, and securing the first security apparatus to the lock interface member via the first aperture. In some embodiments, the method may include removing the first security apparatus from the lock interface member, inserting at least a portion of the second security apparatus into the second aperture, and securing the second security apparatus to the lock interface member via the second aperture. In such embodiments, different security apparatuses can be used with the lock interface member.

[0065] The above description is illustrative and is not restrictive. Many variations of the invention will become apparent to those skilled in the art upon review of the disclosure. The scope of the invention should, therefore, be determined not with reference to the above description, but instead should be determined with reference to the pending claims along with their full scope or equivalents.

[0066] One or more features from any embodiment may be combined with one or more features of any other embodiment without departing from the scope of the invention.

[0067] A recitation of "a", "an" or "the" is intended to mean "one or more" unless specifically indicated to the contrary.

[0068] All patents, patent applications, publications, and descriptions mentioned above are herein incorporated by reference in their entirety for all purposes. None is admitted to be prior art.

WHAT IS CLAIMED IS:

1. A system comprising:

a portable electronic device comprising a lock interface member having a first aperture configured to engage with a first security apparatus and a second aperture configured to engage with a second security apparatus; and

at least one of the first security apparatus and the second security apparatus engaged with the lock interface member.

2. The system of claim 1 wherein the lock interface member is integral with a chassis in the portable electronic device.

3. The system of claim 1 wherein the portable electronic device is a computer.

4. The system of claim 1 wherein the second aperture is a 3 mm x 7 mm slot.

5. The system of claim 1 wherein the first aperture comprises protrusions or stabilizing apertures.

6. A method comprising:

obtaining a portable electronic device comprising a lock interface member having a first aperture configured to engage with a first security apparatus and a second aperture configured to engage with a second security apparatus;

inserting at least a portion of the first security apparatus into the first aperture; and

securing the first security apparatus to the lock interface member via the first aperture.

7. The method of claim 6 further comprising:

locking the first security apparatus.

8. The method of claim 6 wherein the portable electronic device is a computer.

9. The method of claim 6 wherein the security apparatus comprises a cable.

10. The method of claim 6 wherein only one of the first security apparatus and the second security apparatus can engage with the lock interface member at a time.

11. The method of claim 6 further comprising:

removing the first security apparatus from the lock interface member;

inserting at least a portion of the second security apparatus into the second aperture; and

securing the second security apparatus to the lock interface member via the second aperture.

12. A lock interface member comprising:

a first aperture configured to engage with a first security apparatus; and

a second aperture configured to engage with a second security apparatus.

13. The lock interface member of claim 12 wherein the first aperture comprises at least one protrusion or stabilizing aperture.

14. The lock interface member of claim 12 wherein the second aperture is in the form of a rectangular slot having dimensions of about 3 mm by about 7 mm.

15. The lock interface member of claim 12 wherein the lock interface member comprises plastic.

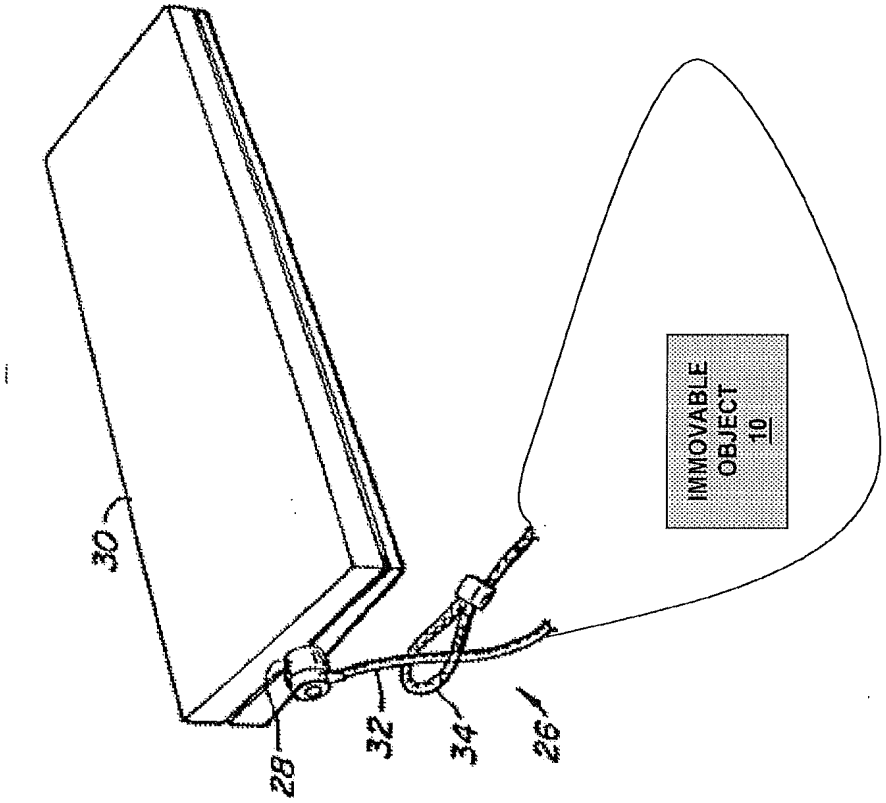
16. The lock interface member of claim 12 wherein the lock interface member comprises steel or a nickel alloy.

17. The lock interface member of claim 12 wherein the first aperture and the second aperture are spaced sufficiently close together such that only one of the first security apparatus and the second security apparatus can be secured to the lock interface member at a time.

18. A chassis for a portable electronic device comprising the lock interface member of claim 12.

19. The lock interface member of claim 12 wherein the first aperture and the second aperture are in a stacked relationship.

FIG. 1



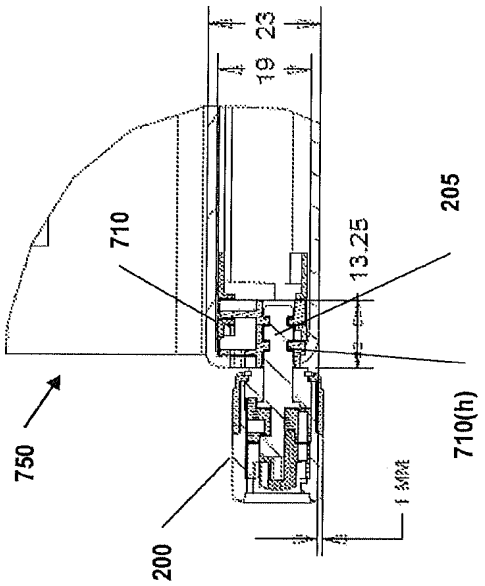

23
19
710
13.25
205
750
710(h)
200

FIG. 2(b)

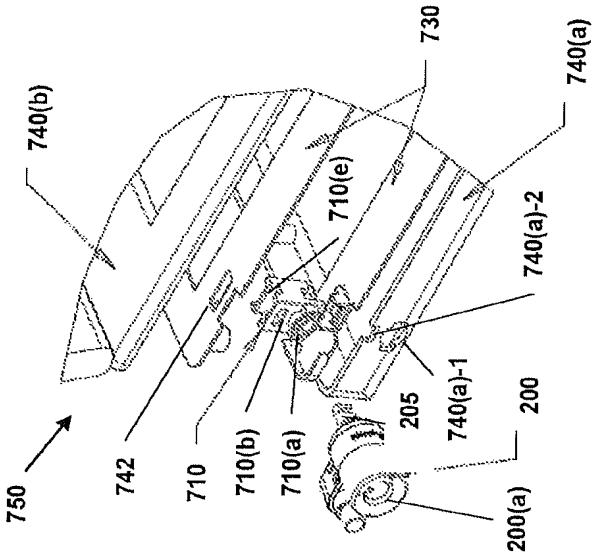

730
740(b)
740(a)
710(e)
740(a)-2
742
710
710(b)
710(a)
205
740(a)-1
200
750
200(a)

FIG. 2(a)

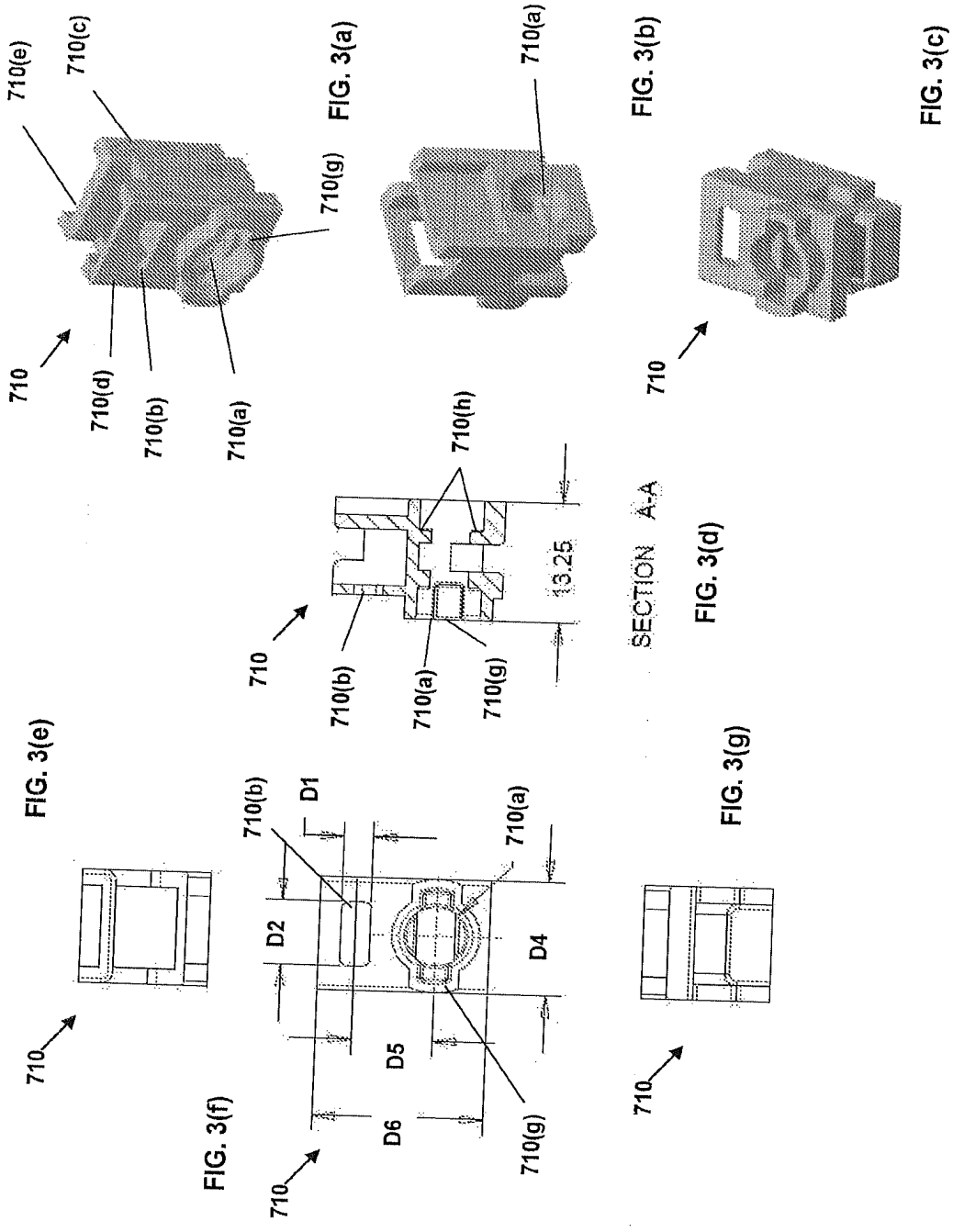


FIG. 3(a)

FIG. 3(b)

FIG. 3(c)

FIG. 3(d)

FIG. 3(e)

FIG. 3(f)

FIG. 3(g)

Ex. 1002 - Page 802 of 997

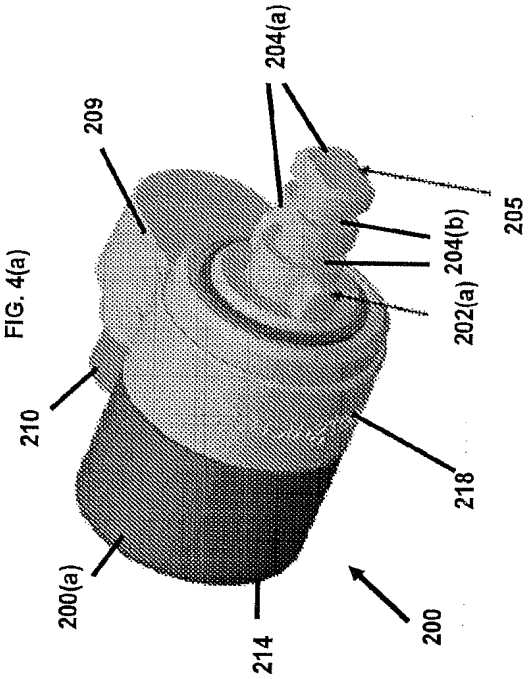


FIG. 4(a)

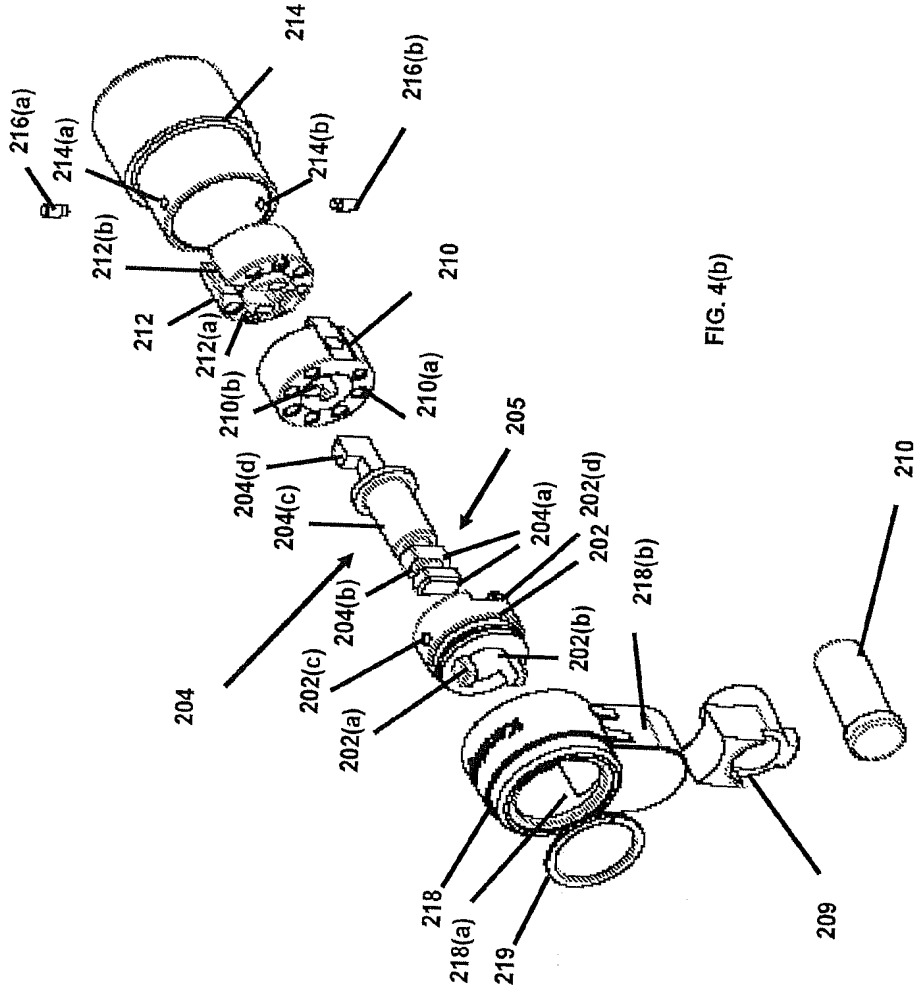

216(a)
214(a)
214
216(b)
214(b)
212(b)
212
212(a)
210
210(b)
210(a)
205
204(d)
204(c)
204(b)
204
204(a)
202(d)
202
202(c)
202(a)
202(b)
218(b)
210
218
218(a)
219
209

FIG. 4(b)

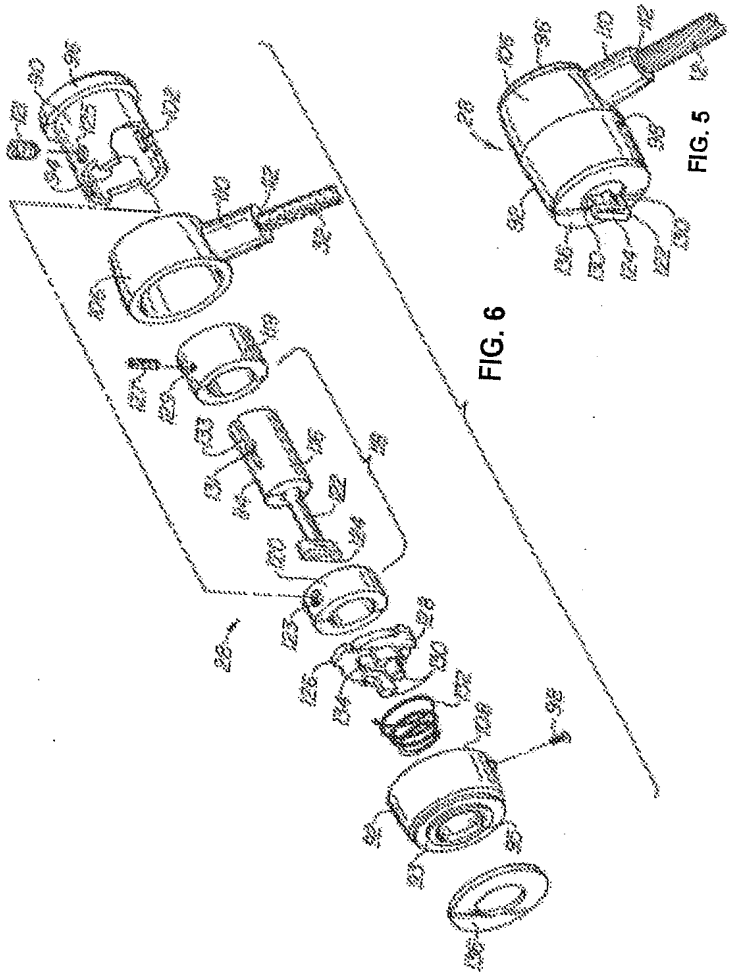


FIG. 6

FIG. 5

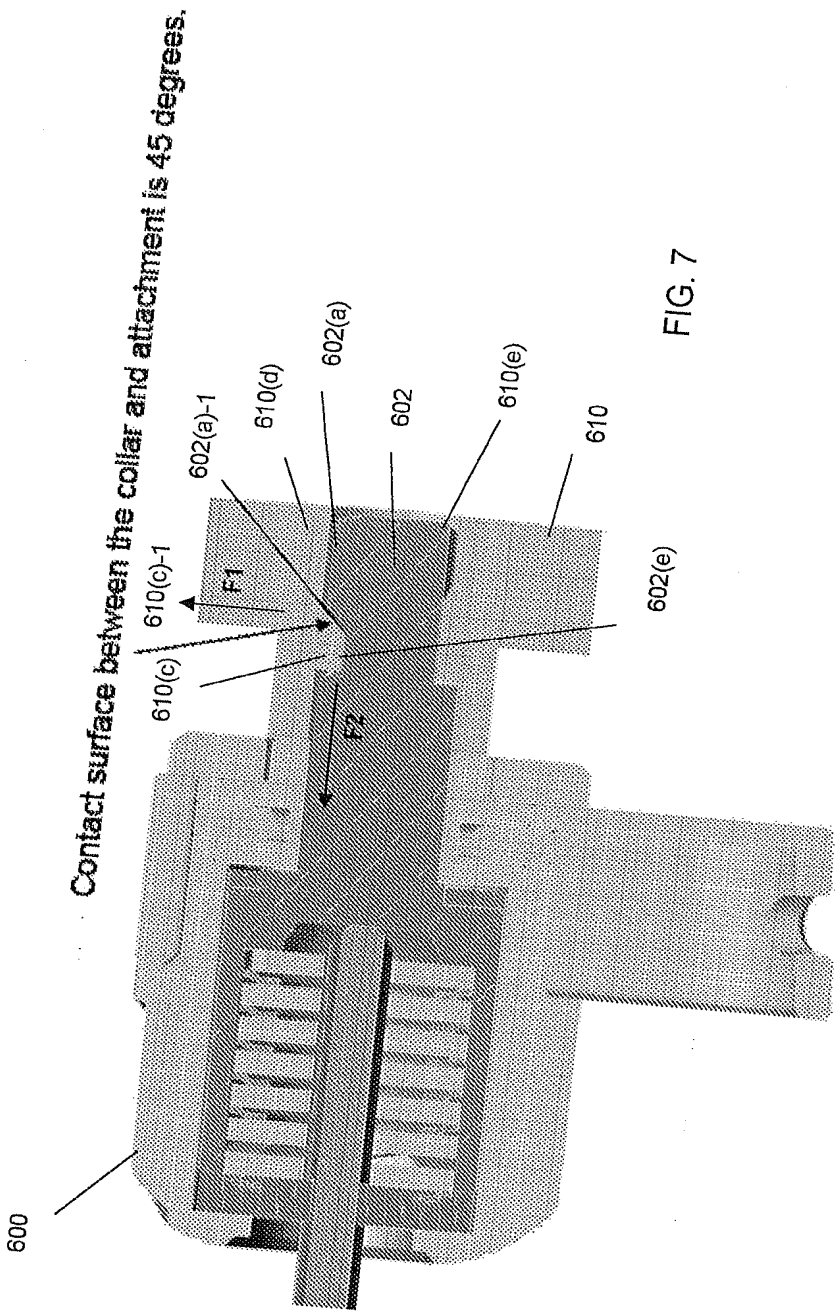

Contact surface between the collar and attachment is 45 degrees.
600
610(c)
610(c)-1
F1
F2
602(a)-1
610(d)
602(a)
602
610(e)
610
602(e)

FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 08/64382

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - E05B 65/48 (2008.04)
USPC - 70/6
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
USPC: 70/6

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 70/2, 6, 7, 14, 57.1, 58; search terms below

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Delphion [German (Applications - Full text), German (Granted - Full text), European (Applications - Full text), European (Granted - Full text), INPADOC, Abstracts of Japan, US (Granted - Full text), WIPO PCT Publications (Full text), US (Applications - Full text)]; Google Scholar; portable electronic device, lock, assembly

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2004/0040350 A1 (DERMAN) 04 March 2004 (04.03.2004), abstract, para [0010], [0033]-[0034], [0043].	1-19
Y	US 6,763,690 B2 (GALANT) 20 July 2004 (20.07.2004), abstract, col 1, ln 28-55.	1-19
Y	US 6,442,984 B1 (KATOH et al.) 03 September 2002 (03.09.2002), abstract, fig 6, col 4, ln 58-64.	1-19
Y	US 6,112,562 A (MURRAY, JR. et al.) 05 September 2000 (05.09.2000), abstract, col 2, ln 34-57, col 13, ln 54-61.	15
A	US 6,112,561 A (CARL) 05 September 2000 (05.09.2000), abstract, fig 1-3.	1-19
A	US 5,787,738 A (BRANDT et al.) 04 August 1998 (04.08.1998), abstract, fig 1-6.	1-19

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 August 2008 (27.08.2008)	08 SEP 2008
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (April 2007)

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
26 February 2009 (26.02.2009)

PCT

(10) International Publication Number
WO 2009/026225 A1

(51) International Patent Classification:
E05B 73/00 (2006.01)

(21) International Application Number:
PCT/US2008/073476

(22) International Filing Date: 18 August 2008 (18.08.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/957,230	22 August 2007 (22.08.2007)	US
12/192,516	15 August 2008 (15.08.2008)	US

(71) Applicant *(for all designated States except US)*: **ACCO BRANDS USA LLC** [US/US]; 300 Tower Parkway, Lincolnshire, Illinois 60069 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **WHITE, Ryan** [US/US]; 709 Clayton Street, Apt. 3, San Francisco, California 94117 (US). **HUNG, John** [CA/CA]; 312-500 West 10th Avenue, Vancouver, British Columbia (CA). **ANDRES, Guillermo** [US/US]; 3440 Gavina Place, Pleasanton, California 94566 (US). **MAHAFFEY, Robert** [ZA/CA]; 990 West 58th Avenue, Vancouver, British Columbia (CA).

(74) Agents: **PYONIN, Adam J.** et al.; Townsend and Townsend and Crew LLP, Two Embarcadero Center, 8th Floor, San Francisco, California 94111-3834 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

(54) Title: SECURITY APPARATUS WITH STABILIZING ELEMENT

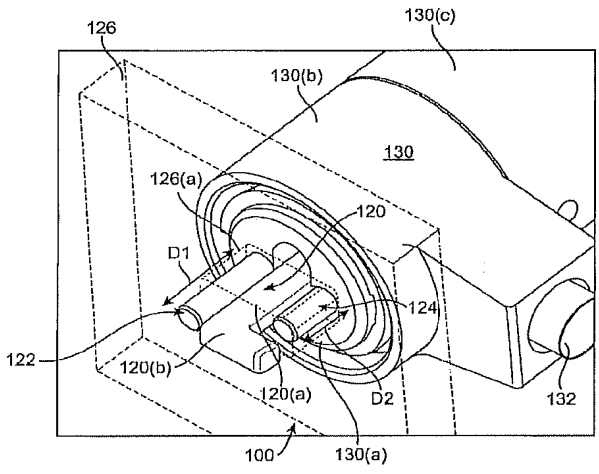


FIG. 3

(57) Abstract: A security apparatus for use with a portable electronic device with an aperture. The security apparatus includes a head including a housing, an engagement element extending from the housing, a first stabilizing element extending from the housing, and can have a second stabilizing element extending from the housing. The first stabilizing element extends out of the housing a first length and the second stabilizing element extends out of the housing a second length. The first and second lengths are different, and a security device is coupled to the head.

WO 2009/026225 A1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2008/073476

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6244080 B1	12-06-2001	JP 3108915 B2	13-11-2000
		JP 10317757 A	02-12-1998
		TW 430712 B	21-04-2001
US 6553794 B1	29-04-2003	US 7143614 B1	05-12-2006
DE 202004015891 U1	23-12-2004	NONE	

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
15 July 2010 (15.07.2010)

PCT

(10) International Publication Number
WO 2010/080402 A2

(51) International Patent Classification:
E05B 49/00 (2006.01) *E05B 47/00* (2006.01)

(21) International Application Number:
PCT/US2009/068080

(22) International Filing Date:
15 December 2009 (15.12.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
12/338,664 18 December 2008 (18.12.2008) US

(71) Applicant *(for all designated States except US)*: **ACCO BRANDS USA LLC** [US/US]; 300 Tower Parkway, Lincolnshire, Illinois 60069 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **MAHAFFEY, Robert** [ZA/CA]; 990 West 58th Avenue, Vancouver, British Columbia (CA). **HUNG, John** [CA/CA]; 312-500 West 10th Avenue, Vancouver, British Columbia (CA). **ANDRES, Guillermo** [US/US]; 3440 Gavina Place, Pleasanton, California 94566 (US). **LEE, Samson** [CA/CA]; 4329 West 16th Avenue, Vancouver, British Columbia V6R 3E6 (CA). **ALI, Will** [CA/CA]; 205-685 West 7th Avenue, Vancouver, British Columbia V5Z 1B6 (CA). **TSE, Wilson** [CA/CA]; 1806 East 35th Avenue, Vancouver, British Columbia V5P 1B6 (CA).

(74) Agents: **PYONIN, Adam, J.** et al.; Townsend and Townsend and Crew LLP, Two Embarcadero Center, 8th Floor, San Francisco, California 94111-3834 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ,

[Continued on next page]

(54) Title: SECURITY APPARATUS WITH IDENTIFICATION MECHANISM

(57) Abstract: A security system is disclosed. Embodiments of the system comprise a key containing a unique identifier, and a security device capable of reading the unique identifier from the key. In certain embodiments the unique identifier is stored on an integrated circuit within the key along with a power supply for the security device. Use of the proper key can initiate the locking or unlocking of the security device, through actuating means.

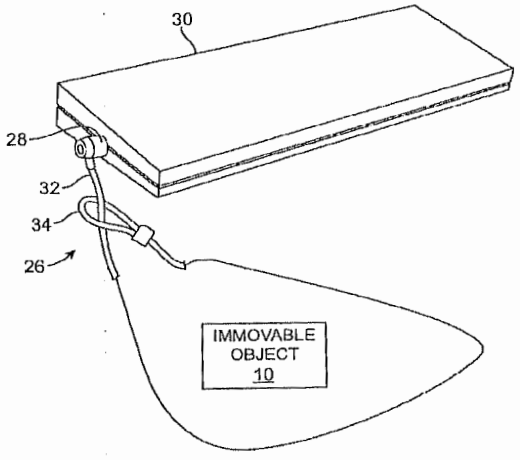


FIG. 1

WO 2010/080402 A2

TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

SECURITY APPARATUS WITH IDENTIFICATION MECHANISM

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This patent application is a PCT application and claims priority to U.S. Non-provisional Application No. 12/338,664, filed on December 18, 2008, which is herein incorporated by reference in its entirety for all purposes.

BACKGROUND

[0002] Traditionally, portable electronic devices, such as portable computers, have been secured by systems employing a cable to attach the devices to a relatively immovable object such as a desk.

[0003] Physical security devices use mechanical keys to lock or unlock a lock head that can be secured to a portable electronic device. While the use of mechanical keys is acceptable, improvements could be made. For example, mechanical keys are relatively easy to reproduce. If a mechanical key is reproduced, then security may be compromised.

[0004] Embodiments of the invention address these and other problems, individually and collectively.

BRIEF SUMMARY

[0005] Embodiments of the invention are directed to security devices, as well as systems and methods for using such physical security devices.

[0006] Another embodiment of the invention is directed to a security device for use with a portable electronic device having a housing and an aperture, the security device comprising: a sensor configured receive at least one identifier stored in a key; a controller coupled to the sensor; an actuating member operatively coupled to the controller, wherein the actuating member is configured to actuate after receiving an unlock signal from the controller; and at least one of a stabilizing element and an engagement member, wherein the actuating member is capable of selectively operatively coupling to the stabilizing element or the engagement member.

[0007] Another embodiment of the invention is directed to a method comprising: obtaining a security device comprising a housing, and a sensor, at least one of a stabilizing

element and an engagement member, and a controller coupled to the housing; inserting at least a portion of the engagement member into an aperture in a portable electronic device housing, thereby securing the security device to the portable electronic device housing; placing a key proximate to the sensor; moving one or more of the engagement member or the stabilizing element; and separating the security device from the portable electronic device housing.

[0008] These and other embodiments of the invention are described in further detail below with reference to the Figures and the Detailed Description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 shows a system according to an embodiment of the invention.

[0010] FIGS. 2A-2B show rear views of a security device and corresponding key, according to an embodiment of the invention.

[0011] FIGS. 3A-3B show front views of a security device and corresponding key, according to an embodiment of the invention.

[0012] FIG. 4A shows a block diagram detailing a method according to an embodiment of the invention.

[0013] FIGS. 4B-1 and 4B-2 respectively show locking heads in a locked state and unlocked state.

[0014] FIG. 5 shows a block diagram of an embodiment of a security device.

[0015] FIG. 6 shows a state diagram of a security device according to an embodiment of the invention.

[0016] FIG. 7 shows an expanded view of an embodiment of a security device.

[0017] FIG. 8 shows a cross-sectional view of the security device of FIG. 7.

[0018] FIG. 9A-9B show cross-sectional views of an embodiment of a security device.

[0019] FIG. 10A-10B show cross-sectional views of an embodiment of a security device.

[0020] FIG. 11A-11B show cross-sectional views of an embodiment of a security device.

[0021] FIG. 12A-12B show cross-sectional views of an embodiment of a security device.

[0022] FIG. 13A-13B show cross-sectional views of an embodiment of a security device.

[0023] FIG. 14A-14B show cross-sectional views of an embodiment of a security device.

[0024] FIGS. 15A-15C show embodiments of circuit diagrams of a security device and key.

[0025] In the figures, like numerals designate like elements, and the descriptions of like elements may not be repeated in some instances.

DETAILED DESCRIPTION

[0026] Embodiments of the invention are directed to security devices, methods for using security devices, and systems using such security devices. The security devices can be used to prevent or deter the theft of portable electronic devices.

[0027] One embodiment of this invention is directed towards a security apparatus that comprises a security device and a corresponding key. The security device is configured to secure a portable electronic device to a stationary object such as a desk. It can have a slot engagement member such as a bar including a T-bar. The engagement member can engage a portable electronic device via a slot in a housing in the portable electronic device. The engagement member in the security device is selectively operatively coupled to an electric motor or other suitable actuating device. That is, the actuating device can be physically coupled to the engagement member at specific moments, such as to unlock the security device. While the security device is in a locked configuration, the actuating device may not be operatively coupled to the engagement member, as will be described in greater detail below. The actuating device is designed to only activate (i.e., operatively couple to the engagement member), after a sensor electrically coupled to the motor receives at least one identifier from a key that is being used by the user. In an exemplary embodiment, the at least one identifier is stored in digital form on an integrated circuit that is present in a key. The at least one identifier may include only one, or at least two, or even at least three or more identifiers.

[0028] Once the sensor in the security device is proximate to the key or is otherwise operatively coupled to it, the integrated circuit in the key sends the at least one identifier to the sensor in the security device. If the at least one identifier is associated with the security device, the actuating member actuates so that it is selectively, temporarily and operatively

coupled to the key. In one embodiment, the actuating member is operatively coupled to the key in a manner that allows the user to move the engagement member when the user moves the key. For example, when the actuating member and the key are operatively coupled together, the user can rotate the engagement member by rotating the key. This allows the user to configure the security device in a locked or unlocked configuration.

[0029] The portable electronic device to be secured may comprise an aperture, and the aperture may be a through aperture or a blind aperture. The aperture may be formed in a housing associated with the portable electronic device. The aperture can have any suitable dimensions, such as about 3 millimeters (mm) by about 7 mm. This aperture can receive and couple with the engagement member of the security device. Alternatively or additionally, the portable electronic device may include a lock interface member, and the lock interface member may comprise the aperture. The lock interface member may be used to enhance security and may improve the strength of the coupling between the portable electronic device and the security device. The lock interface member may be an attachment that may be attached to the housing of the portable electronic device, or it may be integrally formed in the housing. For example, in some embodiments, the lock interface member may be operatively or physically coupled to the chassis of the portable electronic device and/or may be operatively or electrically coupled to some electrical component in the portable electronic device. Exemplary lock interface members are described in U.S. Provisional Patent Application Nos. 60/853,888, filed on October 23, 2006, 60/909,867, filed on April 3, 2007, and 60/940,318, filed on May 25, 2007, as well as PCT Application Nos. PCT/US07/76884, PCT/US07/82139, and PCT/US07/82134, all filed on October 22, 2007, which are herein incorporated by reference in their entirety for all purposes.

[0030] A security device according to an embodiment of the invention may comprise a head and a cable. The head and the security cable may be physically and/or operationally coupled together.

[0031] The security device may comprise a cable as described above, or some other type of mechanism to provide security. If the security device comprises a cable, then the cable may be secured to an object other than the security device or portable electronic device, such as a stationary object. The stationary object can comprise objects such as a desk or cabinet so that a portable electronic device coupled to the cable cannot be removed. In another embodiment, the security device may comprise a wireless communicator such as a

wireless transmitter and/or receiver in place of, or in addition to, the security cable. The wireless communicator may be used in a proximity detection system or a motion detection system. For example, a motion detector could present in the wireless communicator so that when the motion detector moves, an associated alarm is triggered. The alarm may be in the security device or may be external to the security device. In another embodiment, there may be a base device associated with the wireless communicator, and these components may be used in a proximity detection system. Wireless signals may be transmitted between the security device and the base device, and when these devices are separated by a predetermined length, an associated alarm (e.g., an audible alarm) may be triggered. The alarm could be in the base device or in the security device.

[0032] The head may be a locking head. A locking head according to an embodiment of the invention may comprise a locking mechanism such as an electronic key locking mechanism or a combination locking mechanism disposed within it.

[0033] The portable electronic device that is to be secured by the security device may comprise any suitable portable electronic device. Examples of such portable electronic devices comprise boxes, bags such as laptop bags or backpacks, or portable electronic devices such as portable computers, printers, flat panel televisions and monitors (small and large), projectors, external hard-drives, portable media devices, smartphones, etc., or any combination thereof.

[0034] FIG. 1(a) shows an embodiment of a system comprising a portable electronic device **30** and a security device **26** that is used to secure the portable electronic device **30** to a stationary object **10** such as a desk leg or the like. The security device **26** comprises a head **28** and a security cable **32**. The cable **32** is coupled to the head **28**, which may be a locking head in this example. A loop **34** is at a terminal end of the cable **32**. The cable **32** may comprise a strong material such as stainless steel or Kevlar™.

[0035] To secure the portable electronic device **30** to the stationary object, the cable **32** may be wrapped around the stationary object and the head **28** may pass through the loop **34**. An engagement member (e.g., a slot engagement member) in the head **28,** or at least a portion of the engagement member, may then be inserted into a security slot comprising an aperture in the portable electronic device **30**, or in an aperture in a lock interface member (not shown) that is associated with the portable electronic device **30**. The head **28** may also comprise at least one stabilizing element (e.g., a pin). The stabilizing element may be

inserted, concurrently with the slot engagement member, into the security slot or to stabilize the head **28,** so that the engagement member cannot be readily withdrawn from the aperture. In some embodiments, the slot engagement member may be in the form of a T-bar. The stabilizing element may comprise one or more anti-rotation pins. A locking mechanism such as an electronic key locking mechanism in conjunction with an actuating member may be used to keep the stabilizing element and/or the slot engagement member from moving or not moving. In other embodiments, the stabilizing element may first be inserted into the aperture in the lock interface member, and/or an aperture in the portable electronic device, and the slot engagement member may thereafter be inserted therein to engage the aperture in the portable electronic device or in the lock interface member. In a further embodiment, the slot engagement member may first be inserted into the aperture in the lock interface member and/or an aperture in the portable electronic device to engage the aperture, and the stabilizing element may thereafter be inserted in the portable electronic device or in the lock interface member.

[0036] Specific security device embodiments are shown in FIGS. 2A-14B.

[0037] FIG. 2A shows a security device **101** according to an embodiment of the invention. Security device **101** comprises an engagement member **106**. Engagement member **106** may include a T-bar **106a**, and one or more anti-rotation pins **106b** disposed on opposite sides of the engagement member **106**. The T-bar **106a** may comprise a shaft and a cross-member perpendicular to the shaft. The pins **106b** may be examples of stabilizing elements. Exemplary embodiments include at least one of a stabilizing element and an engagement member. T-bar **106a** and anti-rotation pins **106b** may be aligned so that the security device **101** is in an unlocked configuration (as shown in FIG. 2A). Engagement member **106** can engage an aperture such as a security slot in a housing of a portable electronic device. Cable connector **107** connects the security device **101** to a cable (not shown) that can be present in the security device **101**.

[0038] Components in the security device **101** can be activated by the key **110**. The key **110** may comprise a memory (such as a non-volatile memory) for storing one or more identifiers. The memory may be embodied by an integrated circuit in some embodiments.

[0039] In FIG. 2A, the integrated circuit, which may be present in a container **110(a)**, may store a unique identifier. The container **110(a)** may be in the form of a "button." The button may comprise a 16mm thick stainless steel cylindrical container and an integrated

circuit chip inside of the container. The container **110(a)** is commercially available from Maxim Integrated Products under the tradename iButton®. The data in the iButton® can contain a unique identifier such as a serial number.

[0040] As shown in FIG. 2B, key **110** also contains a power source **111**, such as a battery. In some embodiments, the power supply provides power to the security device **101** when the key **110** is proximate (e.g., close to or in contact with) to the security device **101**.

[0041] FIG. 3 shows a front view of security device **101**. Engagement socket **103**, residing in security device **101**, is capable of receiving key **110**. Engagement socket **103** includes a sensor **103a** that receives the data within integrated circuit in the container **110a**. In embodiments where container **110a** is an iButton®, the engagement socket **103** will comprise an "iButton® sensor." If the data stored in the integrated circuit in the container **110a** comprises the correct identifier, an unlock signal is sent to an actuating member (not shown), which may be a direct current (DC) motor within security device **101**. The unlock signal may cause the actuating member to actuate. The actuating member may actuate and may produce a mechanical force. The movement produced by the actuating member may involve a rotational, linear, or lateral motion. In certain embodiments, the actuation may comprise having the actuating member rotate all or a portion of engagement member **106**. In other embodiments, the actuating member may extend or retract the anti-rotation pins **106b**. In exemplary embodiments, the actuating member may operatively couple the engagement member **106** to the key **110** such that movement of the key **110** causes the engagement member **106** to move. Rotation of the key **110** (such as by a user) can cause the T-bar **106a** to rotate by an equivalent amount, thereby allowing the security device **101** to be in a locked or unlocked configuration. When the user separates key **110** from engagement socket **103**, the actuating member can actuate again. The actuating member can separate from the engagement member (e.g., T-bar) or stabilizing element (e.g., pins), so that rotation of the end of the security device **101** (e.g., by an unauthorized key or device) will not move the engagement member **106** or the pins **106b**. At this point, the security device **101** is in a locked configuration.

[0042] FIG. 4A shows a block diagram detailing a method of using a security device according to an embodiment of the invention. In step **301**, the security device **101** is in the closed, "locked" configuration. In exemplary embodiments, the security device will remain in the closed, locked configuration at all times, other than when a key containing a proper

identifier is proximate to the security device **101**. The closed, locked configuration is illustrated by the vertical orientation of the cross-member of the T-bar **106a** in FIG. 4B-1. The cross-member of the T-bar **106a** is misaligned with the anti-rotation pins **106b** so that the T-bar **106a** of the security device **101** cannot be removed from the aperture **30a**. The closed configuration allows the security device **101** to be secured to an aperture **30a** within a housing **30** of a portable electronic device (not shown). The security device **101** cannot be separated from the portable electronic device without damaging the housing **30**.

[0043] Referring again to FIG. 4A, in step **302**, key **110** (see FIG. 3), is placed proximate to the security device **101**. In this step, the container **110b** with the integrated circuit is inserted within the engagement socket **103,** so that integrated circuit in the container **110a** can pass the unique identifier to the sensor **103a**. In some embodiments, energy is supplied from the power source **111** (see FIG. 2B) in the key **110** to components in the security device **101**, thereby allowing the sensor **103a** (see FIG. 3) to receive a signal from the integrated circuit in the container **110a**. This signal may contain the unique identifier stored in key **110**.

[0044] A controller (not shown) in the security device **101** receives the unique identifier from the sensor **103a**. The controller determines if the unique identifier that is received matches one that is stored in a memory in the security device **101**. If the unique identifier that is received is not recognized by the controller, the actuating member (not shown) in the security device **101** does not actuate and the security device **101** remains in the locked configuration. If the unique identifier that is received by the controller is the correct one, the actuating member is actuated in step **303**, and the security device **101** is in an open, unlocked configuration.

[0045] In some embodiments, the actuating member rotates components inside of the head of the security device so that it is in the open configuration. In other embodiments, a user can rotate the engagement member (while the actuating member is activated) by rotating the key, to configure the security device **101** so that it is in the unlocked configuration. The unlocked configuration is shown by the substantially horizontal position of the cross-member of the T-bar **106a** in FIG. 4B-2. In the unlocked configuration, the T-bar **106a** of the security device **101** can be inserted into or removed from an aperture in a portable electronic device. In certain embodiments, the actuating member itself is powered by the power supply on the key, which transmits power to the security device **101** via the

engagement socket. In one implementation, the actuating member is actuated so that is it in an unlocked configuration for a predetermined time, after which the security device will automatically revert back to the locked configuration. In other implementations, the security device **101** can be in the open (i.e., unlocked) configuration as long as the key **110** is proximate to the engagement socket **103**.

[0046] FIG. 5 shows a block diagram of a security device **101** and an associated key **110**, according to an embodiment of the invention. The security device **101** may include a sensor **103** electrically coupled to a controller **109**. The sensor **103** can read a unique electronic identifier from the key **110**, to determine if the key **110** is properly associated with the security device **101**. The sensor **103** can send the electronic identifier that is received from the key **110** to the controller **109**. The controller **109** can compare the received identifier to a registry, or list, of predetermined identifiers stored in the memory **108**. The list of predetermined identifiers stored in memory **108** can include those identifiers that will work with security device **101**. Thus, in one aspect, if a key **110** contains any of the predetermined identifiers that are stored in the memory **108**, then the key **110** can lock or unlock the security device **101**. Once a proper key has been determined by the controller **109**, an unlock signal can be sent by controller **109** to the actuating member **105**. The actuating member **105** is then electrically or mechanically connected to an engagement member **106**, such that the engagement member **106** can move. Moving the key **110** can also cause the engagement member **106** to move so that the security device **101** is in a locked or unlocked configuration.

[0047] The controller **109** can be a microprocessor that is located within the body of the speaker device. The controller is **109** electrically coupled to memory **108**, which may comprise one or more volatile or non-volatile memory devices such as ROM, EEPROMs, etc. Memory **108** may store code for one or more identifiers, and code for performing any of the functions performed by the security devices and systems described herein, some or all of which may be implemented or executed by controller **109**. The memory may also include computer readable media. Examples of computer readable media include magnetic, electronic, or optical disks, chips, etc. The identifier may also be written in any suitable computer programming language including C, C++, etc.

[0048] In certain embodiments, the memory may be programmed by the manufacturer of the security device. In exemplary embodiments, the memory can be programmed by a user

or administrator, allowing for unique identifiers for keys to be at any time added to or removed from a list of identifiers for keys usable with the individual security device.

[0049] Although separate functional blocks are shown in FIG. 5, it is understood that one functional block may be embodied by two or more actual physical components, or two or more functional blocks may be embodied by a single physical component. For example, the sensor **103**, controller **109** and the memory **108** may be integrated into one package or chip. In another example, the memory **108** may be embodied by two or more memory chips or the like.

[0050] Embodiments of security devices can store multiple key identifiers (i.e., unique electronic identifiers), and can be reprogrammed to add further key identifiers or remove existing stored key identifiers. This allows a user to replace any lost keys with a new key that can be "added" to the security device. Also, a company or other group may provision many security devices for its employees. The electronic nature of the keys and security devices in embodiments of the invention allow an administrator to maintain greater control over large device groupings. The administrator can provision keys to work with any number of security devices, and may control "prime keys" that can be used to program security devices, or for other purposes, as will be described in greater detail below.

[0051] In one implementation, a security device as described herein can include a secret algorithm so that the unique electronic identifier of a key is protected. Instead of reading the identifier from the key, the sensor in the security device can read an identifier from the key that serves as a public challenge. On reading this identifier, the security device can compute the correct response, and transmit this response back to the key. The correct response is the password to access the unique electronic identifier. Upon receiving this response/password, the key transmits its unique electronic identifier. This arrangement can provide enhanced security as it deters unauthorized duplication of keys. The duplicator would need to access the key twice to fully duplicate it, which can take longer and be more difficult to fraudulently copy.

[0052] Referring to FIG. 6, a state diagram of a security device according to embodiments is shown. The security device in the embodiment of FIG. 6 can be used with multiple keys. Each key can be separately produced, and can contain a key identifier (an example of a "unique electronic identifier") that can be read by the security device. No two keys will share the same unique electronic identifier. In certain embodiments, the security device

records, in the device memory, the state the security device is currently in, and upon removal of the key, the security device powers down. In some implementations, the security device itself has no power supply and can only be powered on when in contact with a key containing a power supply.

[0053] Once the security device is manufactured, it can be in the factory state **200.** In the factory state **200**, no key identifiers have yet been stored in the memory of the security device. A key can then be placed proximate to the sensor in the security device. The security device can read the key identifier from the key and can add it to the registry in the security device memory. As this is the first key registered with the security device, this key will be the "prime key". It can be used to program the security device to accept other keys, and to program the security device to remove other keys from the key registry. In exemplary embodiments, the prime key is structurally the same as any other key that is used with the security device. In these embodiments, the only difference between a prime key and the other keys is that the prime key is designated "prime" within the memory of the security device.

[0054] After a first key has been registered with the security device as a prime key, the security device can remain in the initialized state **201** until the next event occurs. The initialized state can be the default state for a security device that has been registered with a prime key, and it is the state that most security devices will be in. In this state, another key can be added to or removed from the key registry (as a user key), or the prime key can be used to lock/unlock the security device. For example, the prime key can be used to unlock the device by placing the prime key proximate to the security device, thereby operationally coupling the key and the security device. In certain embodiments, the prime key can contact the sensor in the security device for less than 3 seconds (i.e., a "tap"). The security device can enter state **202**, whereby the security device will temporarily be unlocked. After unlocking, the security device can then revert back to the initialized state **201**, to await the next command.

[0055] If the prime key is instead used with a special gesture rather than the tap, the security device will enter state **203**. This "special gesture" is recognized as a separate signal by the security device, and can be used by the prime key to configure the security device. The special gesture can comprise, for example, holding the prime key against the sensor of the security device for 3 or more seconds. If a user performs the special gesture with the

prime key (in one embodiment, a "prime long" contact), the lock enters state **203**. In exemplary embodiments, the security device can indicate that it is in state **203**. For example, the security device may quickly cause an attached LED to flash, it may cause a small screen such as an LCD readout to display something unique, it may provide an audible indication such as a beep or consecutive beeping, etc. At any time, an unexpected key engaged with the security device can cause the security device to abort the process. The security device may temporarily alert the user to an error in state **208**, for example by flashing a red LED. This may only last for a few seconds, after which the security device can return to state **201**.

[0056] In state **203**, the user has several options. For example, the user may add another key to be used with the security device. This key can be a "user key", and may only be usable to lock/unlock the security device (i.e., it will not have the operational capability of a prime key). To add a new key to be used with the security device, this key can be engaged with the security device while the security device is in state **203**. If the security device is powered down when not in contact with a key, the security device will power up and recognize that it has been put in the introduction/removal mode, in state **204**. The security device will record the key identifier of the new key in the security device memory. The security device may then indicate it has finished processing, for example, by have an LED produce a solid green color for a period of time. The user can then remove the new key from the security device. In certain embodiments, the new key may only need to be engaged with the security device for a "tap", i.e. for less than 3 seconds. The prime key can then be engaged with the security device to confirm the introduction of the new key in state **205**. In certain embodiments, the prime key can be engaged with the security device using the special gesture. The security device can then add the new key identifier to the key registry, and provide confirmation of such in state **205**, for example by turning off the LED. Once the prime key is disengaged from the security device, the security device will revert back to the initialized state **201**, to await the next command. The new key will now be usable with the security device.

[0057] In certain implementations, if a user key is used in place of the prime key in the introduction process described above, the new key may be registered as a "guest key". This guest key may function similarly to a user key, except the guest key can only be used to engage the security device a predetermined number of times (for example, it can unlock the device 5 times). After the predetermined number of operations has been used, the security

device can automatically remove the unique electronic identifier associated with the guest key from memory. Thus, the guest key will no longer be able to lock or unlock the security device.

[0058] From state **203**, a user may also remove a key from the registry. To remove the key so that it cannot be used with the security device, this key can be engaged with the security device while the security device is in state **203**. If the security device is powered down when not in contact with a key, the security device can power up and recognize that it has been put in the introduction/removal mode, in state **204**. The security device can record the key identifier of the key, in the security device memory. The security device may then indicate it has finished processing, for example by having an LED produce a solid green color. The user can then remove the new key from the security device. In certain embodiments, the key may only need to be engaged with the security device for a "tap", i.e. for less than 3 seconds. The prime key can then be engaged with the security device to finish the removal of the key in state **206**. In certain embodiments, the prime key will be engaged with the security device using the special gesture. The security device can then compare the recently read key identifier with the list of key identifiers in the key registry stored in memory. Since this key identifier is the same as a listing in the registry, the security device can remove the listing from the registry, such that the key will no longer be usable with the security device. The security device can confirm it has removed the key from the registry in state **206**, for example by turning off the LED. Once the prime key is disengaged from the security device, the security device will revert back to the initialized state **201**, to await the next command. In certain implementations, only a user key can be removed from the registry, for security reasons. To reset the security device to the factory state (i.e., remove the prime key) in these implementations, the security device may be required to connect to another machine, such as a general purpose computer or a special purpose system. In other implementations, any key may be removed from the registry according to the above-described method, including prime keys.

[0059] From state **203**, a user may also erase the entire key registry. This can erase every stored unique electronic identifier associated with a user key, so that the only key(s) that will still be usable with the security device are the prime key(s). To erase the entire key registry, from step **203** the prime key will be engaged with the security device. In certain embodiments, the prime key will only need to "tap" the security device for this. Such engagement will set the security device to introduction/removal state **204**, and the security

device will record in the memory that the prime key was just engaged with the security device. The security device may then indicate it has finished processing, for example by having an LED produce a solid green color. The prime key can then again be engaged with the security device to finish the erasure of the key registry in state **207**. In certain embodiments, the prime key can be engaged with the security device using the special gesture. The security device can retrieve the recording of the last engaged key in this state. Recognizing that the last engaged key was the prime key, the security device can then delete the key registry of all registered user keys. The security device can confirm it has removed the key from the registry in state **207**, for example by turning off the LED. Once the prime key is disengaged from the security device, the security device will revert back to the initialized state **201**, to await the next command.

[0060] Once a key has been registered with the security device, it can be used to unlock the device. While the security device is in the initialized (default) state **201**, a user key can tap the sensor located in the security device. The security device will be powered by the battery on the key, while the key is engaged. The security device can use the sensor to read the unique electronic identifier from the key, and can compare it to the list of identifiers in the memory. If the security device recognizes the unique electronic identifier, the security device can then temporarily enter the unlock state **210**. In this state, the security device will be in the open position and may be coupled to or uncoupled from a portable electronic device. In certain embodiments, the security device will maintain state **210** for a temporary amount of time, such as 20 seconds, after which the security device will revert back to state **201** (i.e., it will revert to the closed position). In other embodiments, the security device can maintain state **210** for as long as the key is coupled to the sensor. For any state described above, the security device may time out if no further actions are taken after a predetermined time, such as about 15 or 20 seconds. Furthermore, the security device may alert a user to each state change, such as by flashing or otherwise implementing an LED.

[0061] In exemplary embodiments, the security device may be programmed by a separate computer system. In one example, a standard personal computer running key management software may be used. A hardware interface may be used to connect the computer to the security device. In one implementation, a cable can connect a RS-232 port on the security device with a USB port on the computer. In other implementations, the computer may also use an RS-232 port. In other implementations, other types of ports may be used, such as PCI express or firewire. In certain embodiments, the security device will only be

programmed by the key management software while the prime key is simultaneously engaged. The key management software may require a user identifier and/or a password to operate. The key management software may contain or access a database file containing a list of keys. This way, the key management software can control which, if any, of these keys are registered with individual security devices. Thus, a key may be registered with a security device by selecting it from the database file using the key management software, by the physical engagement method described above, or by manually entering the key identifier associated with the key using the key management software. Removal of keys can similarly be effected using the key management software. In certain embodiments, the key management software may also be able to reset the security device to the factory state (to remove all keys, including the prime key, from being registered).

[0062] Embodiments of security devices described herein have many advantages over standard, physical key systems. The electronic nature of the key identifiers allows each security device to easily work with a plurality of different keys. Furthermore, there is no need to cut keys using a mechanical process. Thus, a nearly inexhaustible number of keys may quickly and easily be created electronically and used with the security devices described herein. Custom key systems are simple to implement, and reordering keys to be used with specific locks can be a simple matter. This allows a company or other to deploy the security device for a variety of purposes, as the security device is easily customizable. For example, a user or company may deploy one or more security devices to secure one or more portable electronic devices. Each security device has a memory that records at least two keys-one prime key, and at least one user key. Should a user key be lost, a new generic key (i.e., one that contains a unique electronic identifier but is not programmed with any lock) can be ordered from the manufacturer, and easily programmed to be usable with a security device as described above. In other embodiments, a security device may not be programmed with a prime key, but only one or more user keys. The user keys can be programmed to work with the security device by the manufacturer or supplier. Thus, the security device is only usable with the pre-programmed user keys. This system provides simplicity for an end user as it works much like a physical-key lock with no further programming required.

[0063] In certain embodiments, a plurality of security devices may be programmed to work with a "master key". This master key can function similarly to a user key or prime key as described above, for more than one security device. An administrator can maintain

the master key, and use it to replace any lost user keys for a security device in the plurality of security devices. Also, the administrator will be able to use the master key to lock/unlock any of the security devices. This can be useful for accessing company property that is secured by the master key system, for example. In some embodiments, each security device in a plurality of security devices may be programmed to only be usable with one or more master keys. Thus, all operations of the security devices can be centrally controlled by an administrator or any other holder of a master key.

[0064] FIGS. 7-14B show various embodiments of security devices. FIG. 7 shows an expanded view of a security device according to an embodiment of the invention where an actuating member rotates an engagement member to effect locking or unlocking. FIG. 7 shows a system including a key **110**, and a security device. The security device includes a first housing portion **124** and attached to a second housing portion **120**. These may form the housing of the head of the security device. A cable ring **126** and a rubber gasket **124** are attached to the first housing portion **124**. Anti-rotation pins **122** extend from a pin assembly, and a T-bar **104** passes through the pin assembly. A DC motor **105**, which is an example of an actuating member, is coupled to the T-bar **104** and can turn it under appropriate circumstances. Electronics, including a controller **109**, underneath the socket **103** can be in electrically communication with the DC motor **105**.

[0065] Components associated with the engagement socket **103** control actuating member **105**. When the sensor **103a** receives an identifier from key **110**, the controller **109** verifies that it is the correct identifier. It then sends an unlock signal to the actuating member **105**, which then actuates and rotates the T-bar **104**. The T-bar **104** can rotate relative to anti-rotation pins **122** so that the security device can be attached to or separated from a portable electronic device (as described above).

[0066] FIG. 8 shows a cross-sectional side view of a security device according to an embodiment of the invention. It shows the key **110** in contact with engagement socket **103**. Engagement socket **103** is connected to actuating member **105**, which is operatively coupled to T-bar **104**.

[0067] FIG. 9A shows a cross-sectional view of a security device in a locked configuration. The engagement member includes T-bar **104** and anti-rotation pins **122**. The T-bar **104** can rotate relative to the anti-rotation pins **122**. The anti-rotation pins **122** are held fixedly within upper cylinder **121**, which can be fixedly connected to cable ring **126**.

In this embodiment, the T-bar **104** includes a plate at the end opposite the cross-member of the T-bar. The plate has a notch **104b** in it. Latch **403** is configured to engage with the notch **104b**. Latch **403** is configured to rotate about pivot **403a**, which is fixedly attached to lock cylinder **402**. A snap ring **128** can be disposed within the security device. The security device is configured to normally be in the locked configuration, where the latch **403** is held by spring **401** and is not engaged with the notch **104b**. In this position, the T-bar **104** is spring loaded and will not rotate relative to the anti-rotation pins **122**.

[0068] To rotate the T-bar **104** relative to the anti-rotation pins **122** (thus, unlocking the security device), a key (not shown) containing a unique electronic identifier engages with engagement socket **103** that is located within lock cylinder **402,** so that the key is held proximate to sensor **103a**. The key includes a power supply that will provide power to the security device. Engagement socket **103** contains a sensor **103a** that is powered by the power supply on the key, and reads the unique electronic identifier from the key. A controller in the security device can compare the unique electronic identifier to a registry of identifiers in the security device memory. If the unique electronic identifier matches a listing in the registry, an unlock signal is sent by the controller to the actuating member **105**. The actuating member **105** can be powered by the power supply included in the key, and can actuate after receiving the unlock signal. Actuating member **105** can comprise any suitable actuator (e.g., a linear actuator), such as a solenoid or motor.

[0069] Once activated, the actuating member **105** engages (such as by extending) the latch **403**, which will rotate around pivot **403a**, as in FIG. 9B. This will cause the latch **403** to physically couple to the T-bar **104** via notch **104b**. While activated, the actuating member **105** can maintain the latch **403** in this physically coupled position. The latch **403** serves to physically couple the T-bar **104** to the lock cylinder **402**. The lock cylinder **422**, in turn, is physically coupled to a key. Thus, rotating the key will rotate the lock cylinder **422**, which in turn will rotate the T-bar **104**, unlocking the security device.

[0070] In embodiments of the invention, the actuating member **105** may only be actuated for a set amount of time (e.g., about 20 seconds), or it may continue to be actuated for the duration that the key is proximate to the sensor **103a**. For example, in some embodiments, once the actuating member is deactivated, the spring **401** pushes the bottom portion of latch **403**, which will rotate around pivot **403a**. The rotation around pivot **403a** will move the top portion of the latch **403** backward, thus disengaging the T-bar **104** from lock cylinder **402**.

If the T-bar **104** is spring activated, it can rotate back to the locked position. In this locked position, the T-bar **104** will no longer rotate, so that the security device will be securely coupled to a portable electronic device.

[0071] FIGS. 10A and 10B illustrate another embodiment of a security device. The security device includes a T-bar **104** and one or more anti-rotation pins **122**. The T-bar **104** can rotate relative to the anti-rotation pins **122**. In this embodiment, T-bar **104** includes a plate at the end opposite the cross member of the T-bar **104**. The plate has a twisted ramp **104b** extending in the direction opposite from the rest of the T-bar **104**. This twisted ramp **104b** is operatively coupled to a ramp **402a** that extends out from the lock cylinder **402**. In this embodiment, the lock cylinder **402** may slide axially within outer housing **120**. The security device is placed in a locked configuration by pushing on button **402b**, which normally extends out from the lock cylinder **402**, axially toward the T-bar **104** as shown in FIG. 10B. This will slide the lock cylinder **402** in an axial directly towards the T-bar **104**. Ramp **402a** then converts the linear motion of the lock cylinder **402** into a rotational motion. This rotational motion rotates twisted ramp **104b**. Thus, pushing on button **402b** will rotate T-bar **104** relative to anti-rotation pins **122** (locking the security device).

[0072] Lock cylinder **402** contains a release latch **503**. Release latch **503** is configured to rotate about pivot **503a**, which is fixedly attached to lock cylinder **402**. When the lock cylinder **402** slides towards the T-bar **104**, the release latch moves in the same direction, until it engages with notch **120a** in outer housing **120**. Release latch is held in place by spring **401** and notch **120a** while the security device is in the locked configuration, which prevents lock cylinder **402** from sliding away from the T-bar **104** (which would unlock the security device).

[0073] To unlock the security device, a key (not shown) containing the proper unique electronic identifier is placed proximate to a sensor in the security device. A controller within the security device can read the unique electronic identifier, and can send an unlock signal to the actuating member **105**, which can activate (i.e., actuate) and extend as shown in FIG. 10A. Actuating member **105** can comprise any suitable actuator (e.g., a linear actuator), such as a solenoid or motor. When actuating member **105** extends, it pushes on a top portion of release latch **503**, which will pivot around point **503a**. The release latch can then disengage from notch **120a**. In one implementation, the key can be physically coupled to lock cylinder **402**, and the user can pull the lock cylinder **402** away from T-bar **104**. In

other implementations, the lock cylinder **402** can be spring loaded to slide away from the T-bar **104.** With the lock cylinder moving away from the T-bar **104**, the ramp **402a** will disengage from T-bar **104**, which can be spring loaded to rotate back into the unlocked configuration.

[0074] FIGS. 11A and 11B show locked and unlocked views, respectively, of another embodiment of a security device **101**. In this embodiment, the T-bar **104** is formed as part of lock cylinder **402**. The lock cylinder **402** and T-bar **104** may be formed of a single piece, or formed separately and coupled to each other by any suitable means (glue, welding, fasteners, etc). The lock cylinder **402** also contains one or more dimples **402c**, on the same side of the lock cylinder as the T-bar **104**. These dimples are configured to act as detents for one or more pins **603a** and **603b** located in holes **121a** in upper cylinder **121**. In exemplary embodiments, the lock cylinder contains two dimples **402c** that can temporarily couple with pins **603a** and **603b**. One or more anti-rotation pins **122** are fixedly disposed within upper cylinder **121**, which itself is fixedly coupled to outer housing **124**. Actuating member **105** (comprising any suitable linear actuator such as a solenoid, motor, etc) is disposed within bore **402d** located in locking cylinder **402**. In the locked configuration of the security device **101**, bore **402d** is aligned with the hole **121a** containing pin **603a**. In this configuration, pin **603a** extends from the upper cylinder **121** at least partially into the bore **402d**, as shown in FIG. 11A. Pin **603a** can be urged into bore **402d** by a coiled compression spring **601** located within hole **121a**. With pin **603a** disposed in both upper cylinder **121** and lock cylinder **402**, the T-bar **104** (as part of lock cylinder **402**) is unable to rotate relative to anti-rotation pins **122**. Thus the security device **101** remains in the locked configuration.

[0075] To unlock security device **101** as shown in FIG. 11B, a key (not shown) containing a unique electronic identifier engages the engagement socket **103** that is located within lock cylinder **402**. While engaged, the key can be held proximate to a sensor in the engagement socket **103**. The key includes a power supply that will provide power to the security device. The sensor can be powered by the power supply on the key, and reads the unique electronic identifier from the key. A controller in the security device will compare this unique electronic identifier to a registry of identifiers in the security device memory. If the unique electronic identifier matches a listing in the registry, the controller sends an unlock signal to actuating member **105**. Power can then be transmitted from the key to actuate the actuating member **105**. Once actuated, the actuating member **105** can extend

toward the locking end of the security device to contact the pin **603a**. This pushes pin **603a** out until the actuating member extends to the shear line formed between the upper cylinder **121** and lock cylinder **402**. In this position, the locking cylinder can rotate with respect to the anti-rotation pins **122** fixed within upper cylinder **121**. When the key engages the engagement socket **103**, rotation of the key will produce an approximately equivalent rotation of the T-bar **104**. Thus, the T-bar **104** can be rotated until pin **603a** engages a dimple **402c**, and bore **402d** is aligned with pin **603b**, as shown in FIG. 11B. In certain embodiments, upon removal of the key while the security device **101** is in the unlocked configuration, the actuating member will revert back into a deactivated configuration (i.e., not extended), so that pin **603b** will extend past the shear line into bore **402d**. In this embodiment, the security device cannot be locked without re-engagement with a properly coded key. In other embodiments, actuating member will maintain the actuated state until the key is placed back in the locked position, so that the T-bar **104** can rotate freely while the security device is in the unlocked configuration.

[0076] Referring to FIGS. 12A-12B, a security device is shown in which the T-bar **702b** is fixed relative to outer housing **120**, and the anti-rotation pins **122** can move laterally. A key (not shown) can be held proximate to sensor **103a**. If the key contains a unique electronic identifier that is registered with the security device, a controller (not shown) within the security device can send an unlock signal to the actuating member **105**. In this embodiment, once actuated, the actuating member **105** rotates gear **105a**, which is physically coupled to reducing gear **702**. Reducing gear is also physically coupled to worm gear **703**, which in turn is physically coupled to a coil **705** attached to anti-rotation pins **122**. Worm gear **703** is physically coupled to anti-rotation pins **122** such that rotation of worm gear **703** will thread the coil **705**, moving the anti-rotation pins **122** in axial directions. Thus, rotation of gear **105a** will cause the anti-rotation pins **122** to move back and forth in an axial direction. The actuating member can rotate gear **105a** either clockwise or counter-clockwise, which will have the effect of moving anti-rotation pins **122** into or out of the housing of the security device. When the anti-rotation pins **122** are fully extended, as shown in FIG. 12A, the security device is in the locked configuration. When the anti-rotation pins **122** are fully retracted, as shown in FIG. 12B, the security device is in the unlocked configuration. Embodiments of the security device contemplate a greater number of gears than shown, for converting the rotational motion of actuating member **105** into

lateral motion of anti-rotation pins **122**. Other embodiments contemplate a fewer number of gears.

[0077] Referring to FIGS. 13A-13B, a security device is shown in which actuating member **105** can actuate (i.e., rotate) T-bar **104** for locking/unlocking of the security device. Actuating member **105** can comprise any suitable actuator that induces rotational motion on one end, such as a DC motor. This mechanical force can rotate the T-bar 104. T-bar **104** is physically coupled to gear **810**, so that rotation of gear **810** creates a rotation in T-bar **104**. Actuating member **105**, when activated, can rotate gear **105a** in either a clockwise or counter-clockwise direction, which will rotate reducing gear **802**. Reducing gear **802** is physically coupled to gear **810**. A sensor **805** disposed within lock cylinder **801** can read sensor marks **810** located on gear **810** to determine the rotational position of T-bar **104**. In one embodiment, the sensor can count marks disposed radially around the gear **810** to determine the rotational position of T-bar **104**. In another embodiment, the sensor can keep track of the rotation of the lock that has occurred previously, so that the current position of T-bar **104** is known. Sensor **805** is operatively coupled to a controller located within the security device, and the controller can use the sensor's readings to determine how far in any direction the bar **104** has been rotated. In certain embodiments, when a proper key is held proximate to a sensor **103a** in the security device, the controller in the security device will determine the rotational position of the T-bar **104**. The controller can calculate from the T-bar position both which direction to then rotate T-bar **104**, and how much rotation is necessary to either position the security device in the locked configuration (as shown in FIG. 13A), or the unlocked configuration (as shown in FIG. 13B). The controller can then send an unlock signal to actuating member **105**, which will actuate in order to rotate the T-bar **104** the required amount of rotation as determined by the controller.

[0078] FIGS. 14A-14B show an alternative embodiment of a security device. FIG. 14A shows a horizontal cross-sectional view, and FIG. 14B shows a vertical cross-sectional view. In this embodiment, the security device **101** can couple to anchor **906**. The anchor **906** can be an example of an engagement member. Anchor **906**, in turn, can be secured on one end to a security slot in the housing of a portable electronic device (not shown), either permanently or removably. The security device **101** can physically couple to the opposite end of anchor **906**, in order to secure the portable electronic device to an stationary object. Exemplary anchors and corresponding security slots are described in U.S. Patent

Application No. 6,360,405, issued on March 26, 2002, which is herein incorporated by reference in their entirety for all purposes.

[0079] While physically coupled to security device **101**, the anchor can be held within inner sleeve **902**. Ball bearings **907** can be located in pockets **902a** of the inner sleeve. Within the pockets **902a**, the ball bearings **907** can be retained between upper cylinder **921** and anchor **906**. Ball bearings **907** can engage with channel **906a** formed within anchor **906**. Thus, while held in place by ball bearings **907**, anchor **906** cannot be removed from security device **101** as shown in FIG. 14A.

[0080] To unlock the security device **101**, a key containing a proper unique electronic identifier can be held proximate to sensor **103a**. A controller (not shown) within the security device can read the unique electronic device identifier, and can send an unlock signal to the actuating member **105**. Actuating member **105** can then actuate upon receiving the unlock signal. Actuating member **105** can comprise any suitable actuator that induces rotational motion on one end, such as a DC motor. Once actuated, actuating member **105** can rotate gear **105a**, which is physically coupled to reducing gear **908**. Reducing gear is physically coupled to worm gear **703**, which in turn is physically coupled to gearing on inner sleeve **902**. Rotation of gear **105a** can rotate inner sleeve **902** within upper cylinder **921** by the predetermined amount (in one example, by approximately 90 degrees). Upper cylinder **921** includes a reducing radius inner wall **921a**. In the locked configuration of the security device **101**, a thicker portion of reducing radius inner wall **921a** holds ball bearings **907** against anchor **906**. In the unlocked configuration of security device **101**, a thinner section of reducing radius inner wall **921a** holds ball bearings **907** against anchor **906**. In this configuration, the ball bearings **907** will have more space while still within pockets **902a**, and can retract or be pushed away from anchor **906**, as shown in FIG. 14B. With the ball bearings **907** retracted, anchor **906** has clearance to disengage from security device **101**. To lock the security device, the above process can act in reverse.

[0081] An exemplary circuit diagram of an embodiment of a security device is shown in FIGS. 15A-15B, and an exemplary circuit diagram of an embodiment of a key containing a unique electronic identifier is shown in FIG. 15C. Referring to FIG. 15A, a clock **1502** can provide a clock signal to controller die **1501**. Controller die **1501** can include the memory, and can be programmed to perform the identifier comparisons and other controller functionality described herein. One or more indicator LEDs **1503** are electrically connected

to controller die **1501**. Controller die **1501** can send an unlock signal to driver circuit **1504**. The driver circuit **1504** can actuate a motor or other actuating member (not shown), such as to unlock the security device. At the factory, the security device can be programmed through connector **1506**. For example, connector **1506** can connect to a computer or other suitable device for programming. In certain implementations, connector **1506** can be sealed off after the security device is manufactured, to prevent tampering. Sensor **1505** can read at least one identifier from a key **1509**, as shown in FIG. 15C. FIG. 15B shows further circuitry within the security device. Input **1507** can connect to the VIN connection from sensor **1505**. In some embodiments, the VIN connection can supply power from a connected key **1509**. Output **1508** can connect to the VCC of the circuit of FIG. 15A, to supply power to the rest of the security device while a key **1509** is connected. It is understood that other suitable circuits could alternatively be used in embodiments of the invention, and embodiments of the invention are not limited to the specific implementation shown in FIGS. 15A-15C

[0082] In exemplary embodiments of security devices, the corresponding key includes an integrated circuit an identifier and a power source such as a battery or capacitor. In certain embodiments, the identifier may comprise at least one identifier. In certain embodiments, the identifier may comprise at least one unique electronic identifier. The security device may not contain its own power source, and can be configured to receive all power from the key. The integrated circuit can comprise an iButton®, and the engagement socket within the security device includes a sensor that comprises an iButton® sensor. In some embodiments, the key can comprise a universal serial bus (USB) drive, which can couple to the security device by means of a USB port. The key may contain additional functionality, such as functioning as a standard USB drive or music player. In other embodiments, the unique electronic identifier may be stored on the key in a card with a magnetic strip or other types of integrated circuits. In additional implementations, the key identifier may be derived from the biometrics of the user, and may be read by the lock using an appropriate sensor mechanism. Alternatively, the unique electronic identifier may be transmitted from the key to the lock using radio frequencies such as with RFID, other wireless signals such as Bluetooth, or other suitable methods.

[0083] In certain embodiments, when they key is held proximate to the sensor of the security device, the key will be physically engaged to the engagement socket within the security device. The key may contain notches that physically couple to matching

protrusions in the engagement socket, or vice versa. In other embodiments, the key can magnetically couple with the engagement socket. In exemplary embodiments, the key is physically engaged to the engagement socket so that, while the security device is in the unlocked configuration, rotation of the key will compel an equivalent rotation of the engagement member of the security device.

[0084] In an exemplary embodiment, the actuating element comprises electromechanical means such as a direct current (DC) motor. In some embodiments, the actuating element may be a rotary motor. In some embodiments, the actuating element may be a linear motor. In other embodiments, the actuating element may comprise magnetic means, a piezoelectric actuator, micro-electromechanical systems (MEMS), a solenoid, or other suitable transducers or actuators. In the embodiments described herein, the engagement member includes an engagement member in the form of a T-bar. However, the bar may take any suitable alternative shape, including an L-bar configuration.

[0085] Embodiments of security inventions as described herein contain advantages. Replacing lost or stolen keys is an inexpensive and simple process, as any generic key with a unique electronic identifier can be programmed to be usable with the security device. Keys may be simple and inexpensive to produce. No locksmith is required to replace keys, which provides enhanced security. A key may be registered with more than one security device, and vice versa. Group management of a plurality of security devices is more efficient, as locks may be programmed in bulk by computer. An administrator has greater control over access to the security devices, as keys may be programmed to be used for specific groups of devices, and guest keys can be provisioned for a limited amount of uses. The security devices can be programmed with only hardware (i.e., no computer interface needed) by means of the prime key. This allows even technologically unsophisticated users to access the expanded capabilities of the devices described herein.

[0086] Embodiments of the designs described herein are advantageously of a compact size. This allows them to easily be carried by a user, increasing the ability to effectively be used in securing a portable electronic device. Furthermore, embodiments can have reduced weight due to the small size. This makes the security device both easier to attach to portable electronic devices, without damaging the housing. No changes need to be made to existing portable electronic devices, as embodiments can work with existing security slots.

Thus, embodiments of security devices described herein can provide enhanced functionality and security within existing security frameworks.

[0087] The terms and expressions which have been employed herein are used as terms of description and not of limitation, and there is no intention in the use of such terms and expressions of excluding equivalents of the features shown and described, or portions thereof, it being recognized that various modifications are possible within the scope of the invention claimed.

[0088] Moreover, any one or more features of any embodiment of the invention may be combined with any one or more other features of any other embodiment of the invention, without departing from the scope of the invention.

[0089] All patent applications, patents, and publications mentioned above are herein incorporated by reference in their entirety for all purposes. None is admitted to be prior art.

WHAT IS CLAIMED IS:

1. A security device for use with a portable electronic device having a housing and an aperture, the security device comprising:

a sensor configured receive at least one identifier stored in a key;

a controller coupled to the sensor;

an actuating member operatively coupled to the controller, wherein the actuating member is configured to actuate after receiving an unlock signal from the controller; and

at least one of a stabilizing element and an engagement member,

wherein the actuating member is capable of selectively locking and unlocking the security device.

2. The security device of claim 1, wherein the controller is configured to send the unlock signal to the actuating member after receiving the at least one identifier.

3. The security device of claim 2, wherein the key includes a power source, and further wherein the sensor is configured to transmit power from the power source to the actuating member after receiving the at least one identifier.

4. The security device of claim 1, wherein the security device includes both the engagement member and the stabilizing element.

5. The security device of claim 1, wherein the actuating member comprises a solenoid.

6. The security device of claim 1, wherein the actuating member comprises a motor.

7. The security device of claim 6, wherein the motor comprises one of a linear motor or a rotary motor.

8. The security device of claim 6, wherein the motor comprises a DC motor.

9. The security device of claim 1, further comprising a cable, wherein the cable is configured to secure the portable electronic device to a stationary object.

10. The security device of claim 1, wherein the actuating member is capable of actuating the engagement member.

11. The security device of claim 10, wherein the actuating member is configured to produce a mechanical force that rotates the engagement member.

12. The security device of claim 11, wherein the engagement member is in the form of a T-bar.

13. The security device of claim 10, wherein the actuating member is configured to extend the stabilizing element into the aperture.

14. The security device of claim 1, wherein the actuating member is configured to selectively couple to the engagement member when the key is proximate to the sensor.

15. The security device of claim 1, further comprising a memory, wherein the memory is configured to store at least one identifier.

16. A security system comprising:
the security device of claim 1; and
the key.

17. The security system of claim 16, wherein the key further comprises a power source, and wherein the security system further comprises the portable electronic device.

18. The security apparatus of claim 17 wherein the engagement member is in the form of a T-bar.

19. A method comprising:
obtaining a security device comprising a housing, and a sensor, at least one of a stabilizing element and an engagement member, and a controller coupled to the housing;
inserting at least a portion of the engagement member into an aperture in a portable electronic device housing, thereby securing the security device to the portable electronic device housing;
placing a key proximate to the sensor;

moving one or more of the engagement member or the stabilizing element; and

separating the security device from the portable electronic device housing.

20. The method of claim 19, wherein moving one or more of the engagement member or the stabilizing element includes moving the engagement member.

21. The method of claim 19, wherein the engagement member rotates.

22. The method of claim 19 wherein placing the key proximate to the sensor comprises placing the key in contact with the sensor, and wherein the security device includes both the engagement member and the stabilizing element.

23. The method of claim 22, wherein the actuating member is configured to retract the one or more anti-rotation pins upon activation, and further wherein rotating at least a portion of the engagement member comprises rotating the slot engagement member relative to the aperture.

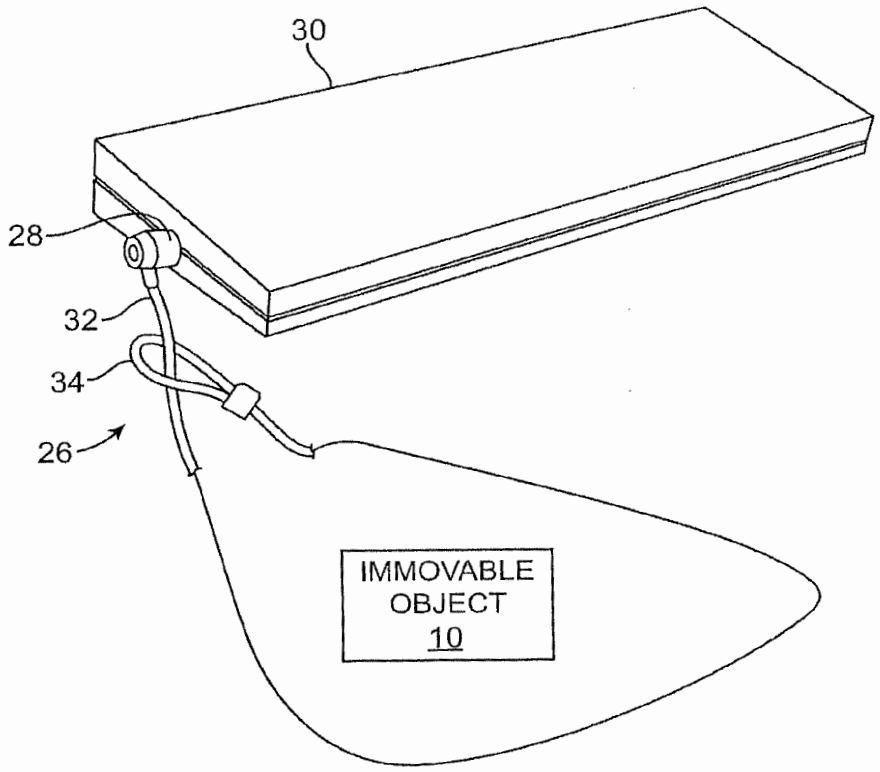


FIG. 1

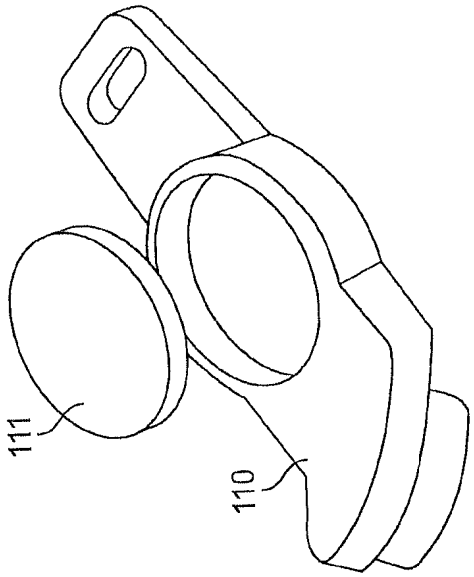


FIG. 2B

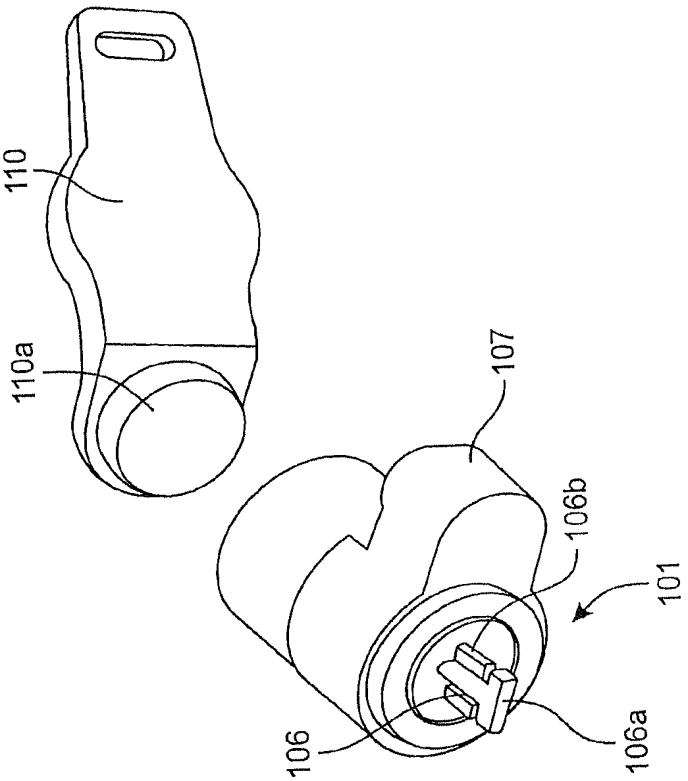


FIG. 2A

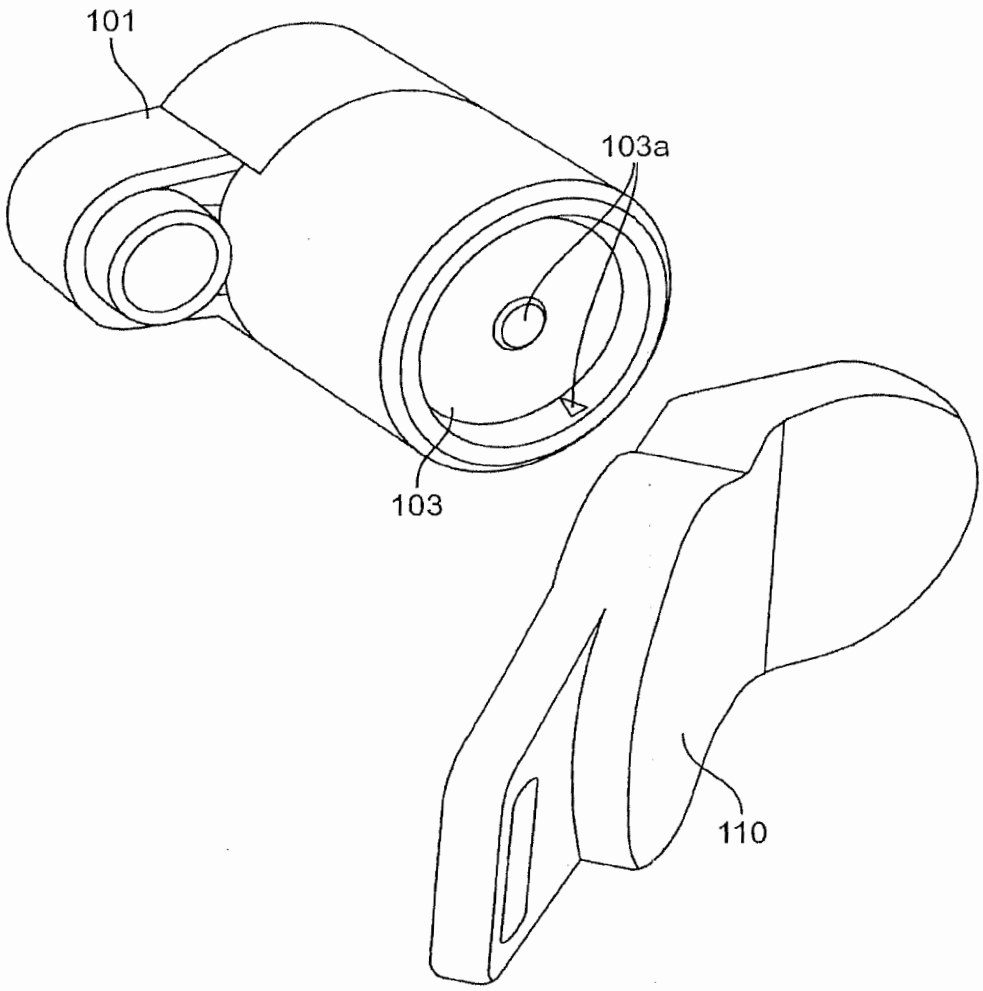


FIG. 3

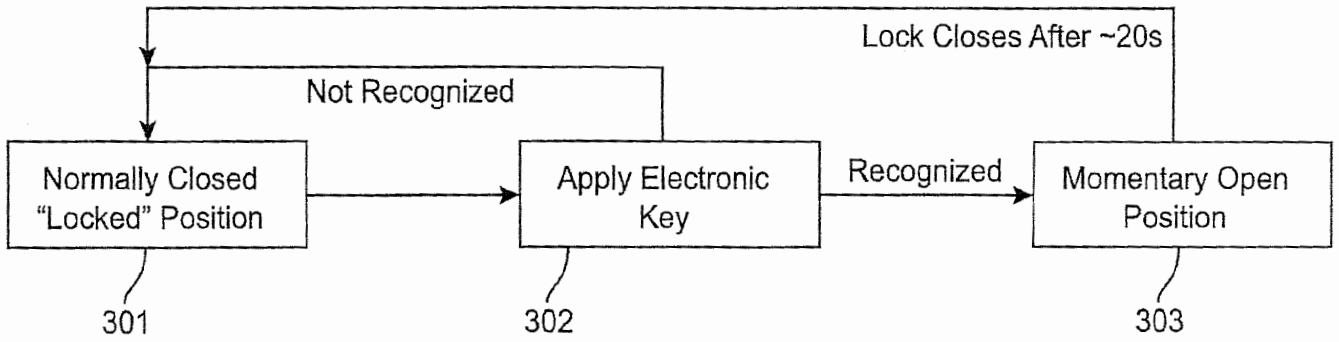


FIG. 4A

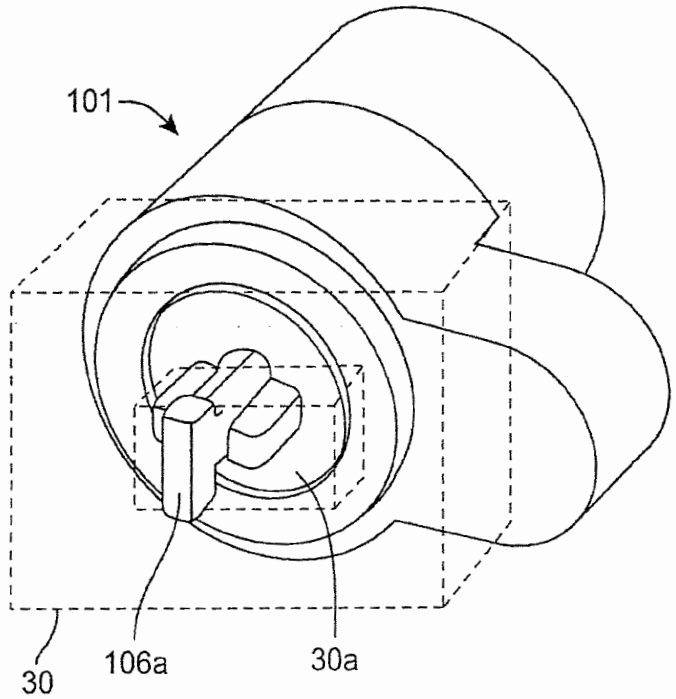


FIG. 4B-1

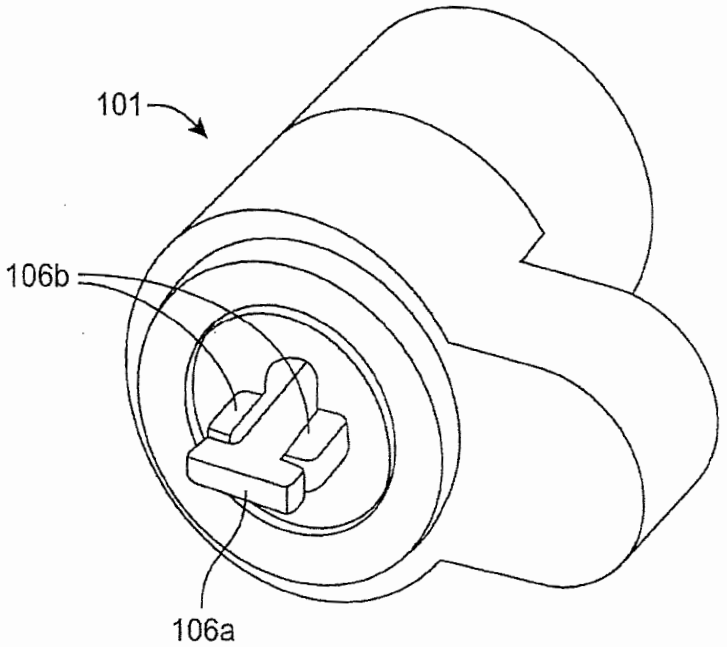


FIG. 4B-2

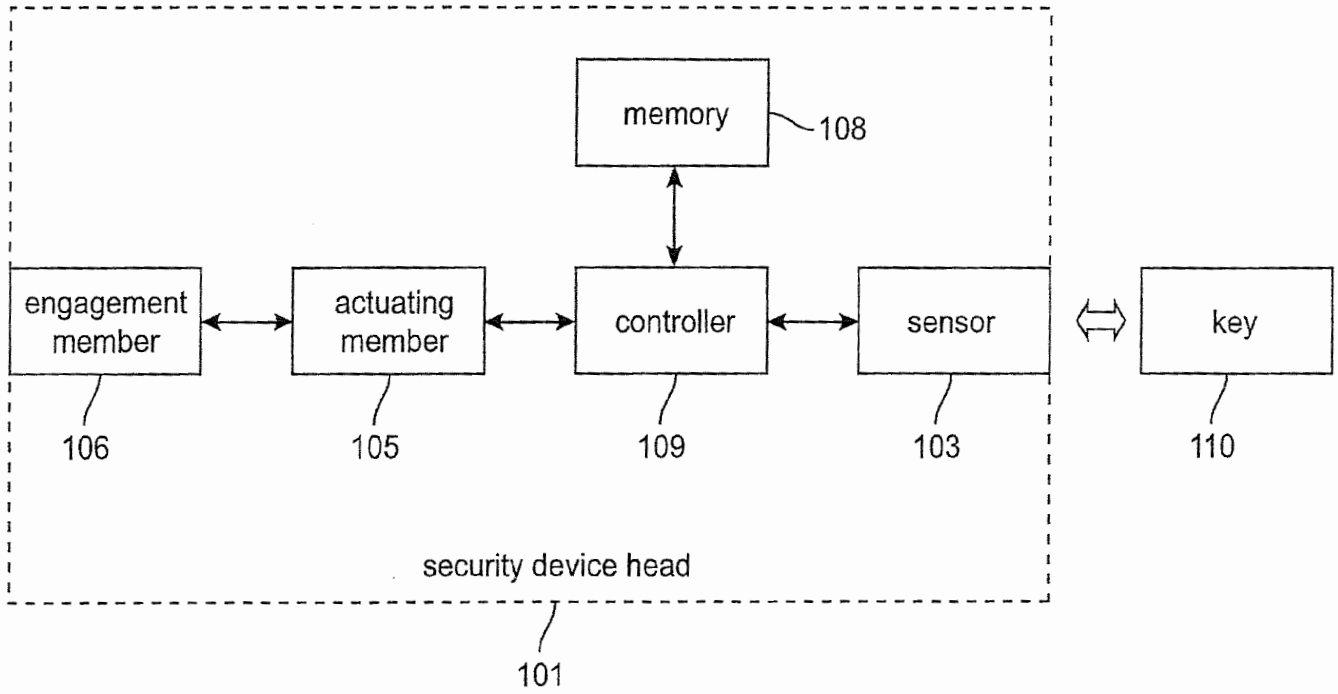

memory
108
engagement member
actuating member
controller
sensor
key
106
105
109
103
110
security device head
101

FIG. 5

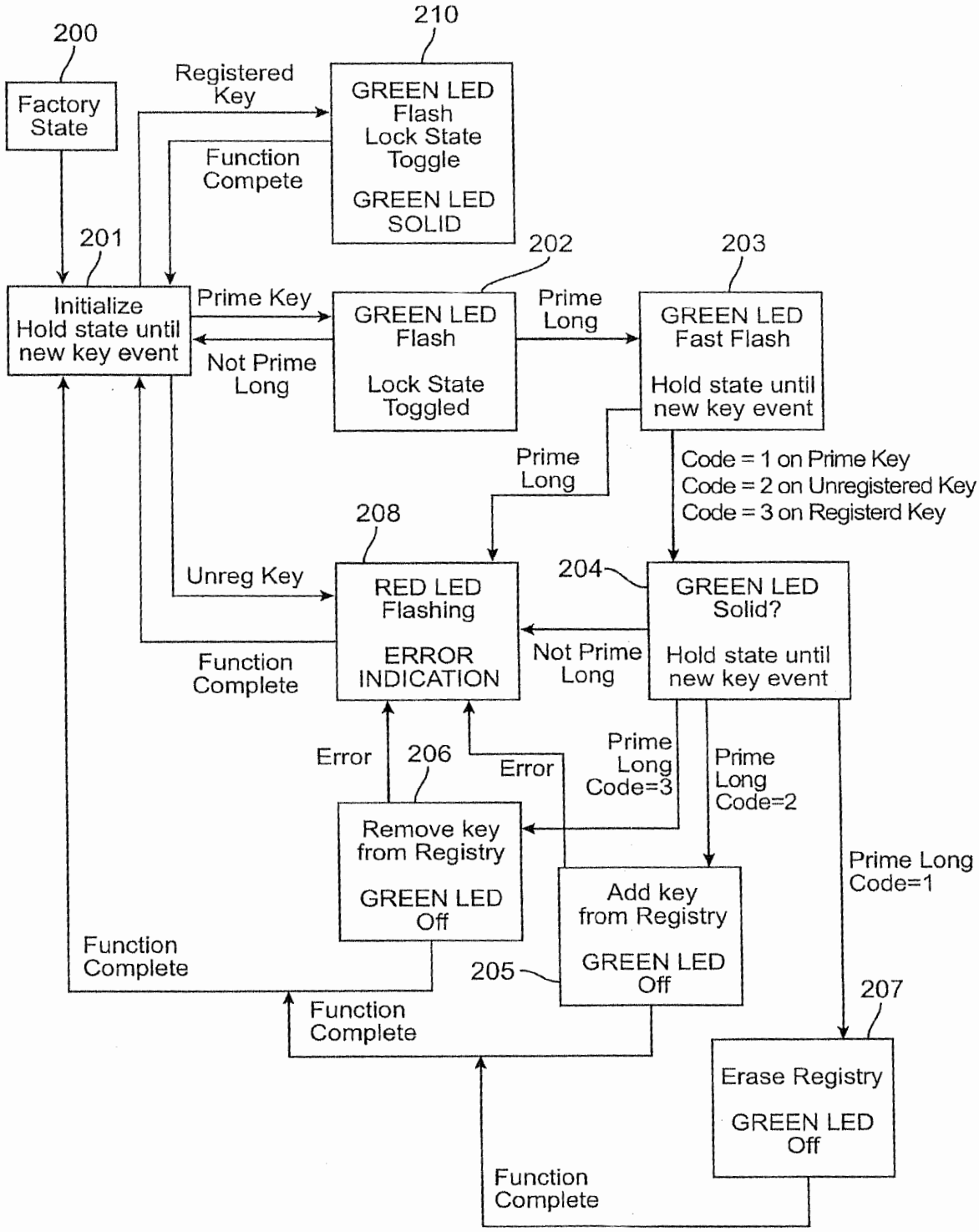

200
Factory State
210
Registered Key
GREEN LED Flash Lock State Toggle
GREEN LED SOLID
Function Compete
201
Initialize Hold state until new key event
Prime Key
Not Prime Long
202
GREEN LED Flash
Lock State Toggled
Prime Long
203
GREEN LED Fast Flash
Hold state until new key event
Prime Long
Code = 1 on Prime Key
Code = 2 on Unregistered Key
Code = 3 on Registerd Key
208
Unreg Key
RED LED Flashing
ERROR INDICATION
204
GREEN LED Solid?
Hold state until new key event
Function Complete
Not Prime Long
Error
206
Error
Prime Long Code=3
Prime Long Code=2
Remove key from Registry
GREEN LED Off
Add key from Registry
GREEN LED Off
205
Prime Long Code=1
207
Function Complete
Function Complete
Erase Registry
GREEN LED Off
Function Complete

FIG. 6

Ex. 1002 - Page 846 of 997

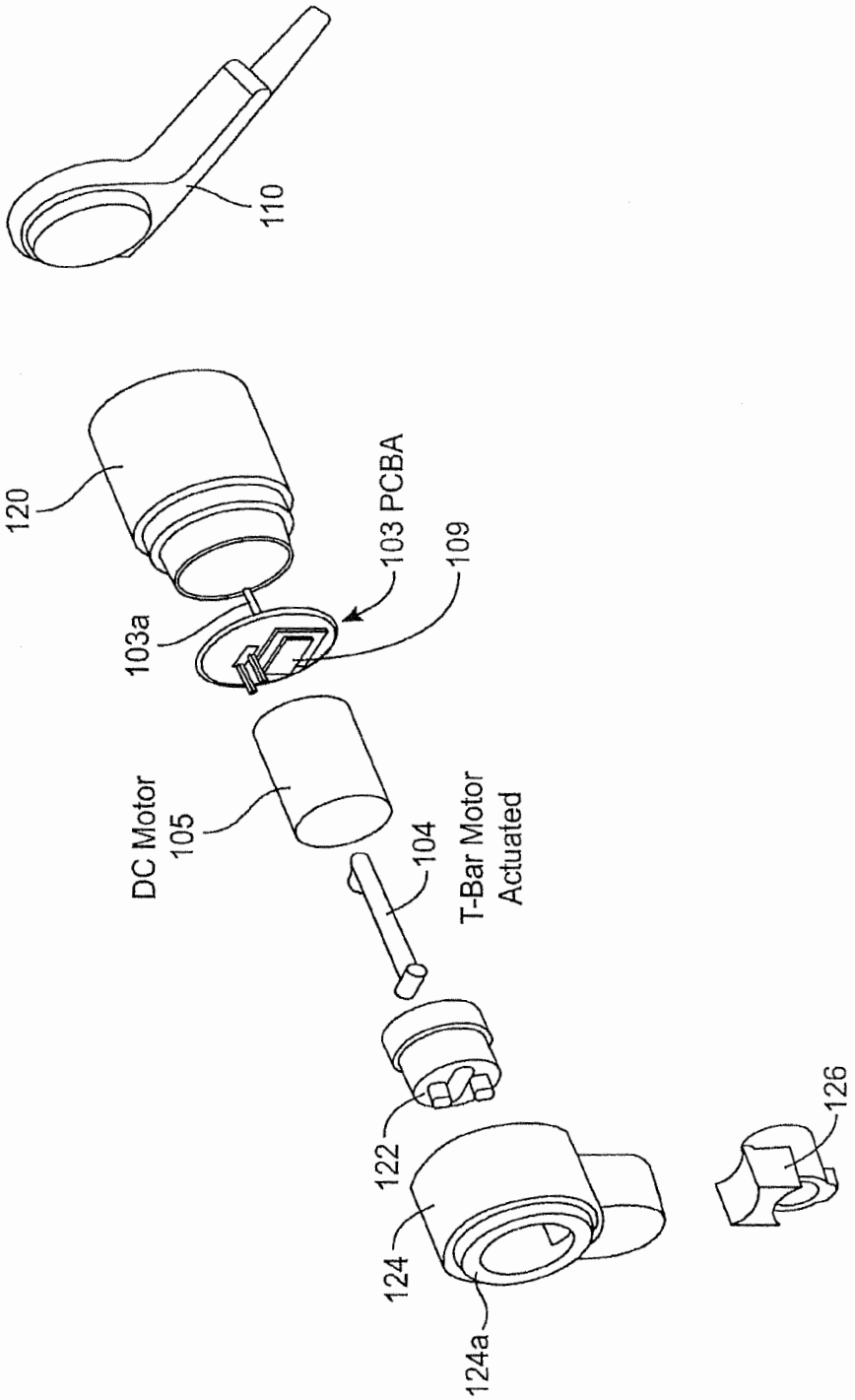


FIG. 7

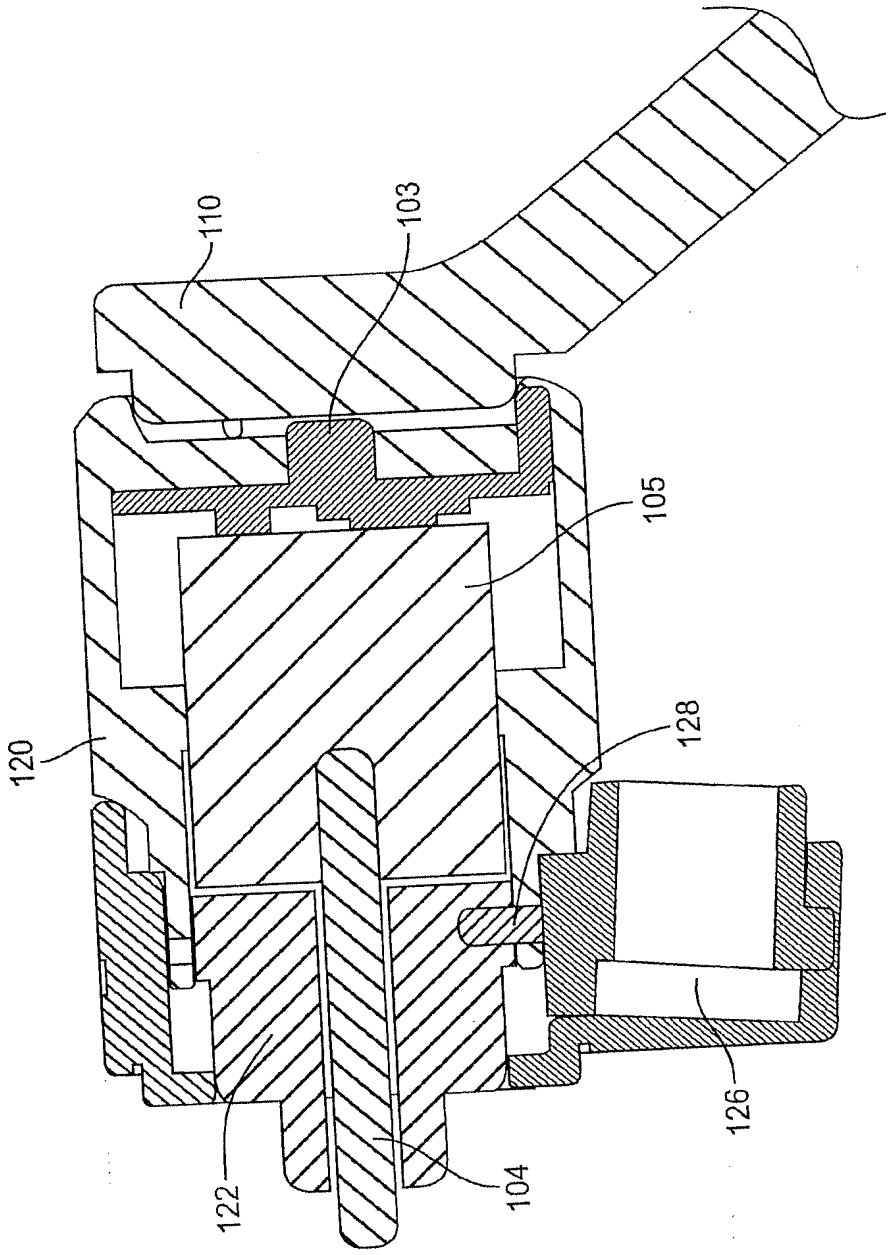


FIG. 8

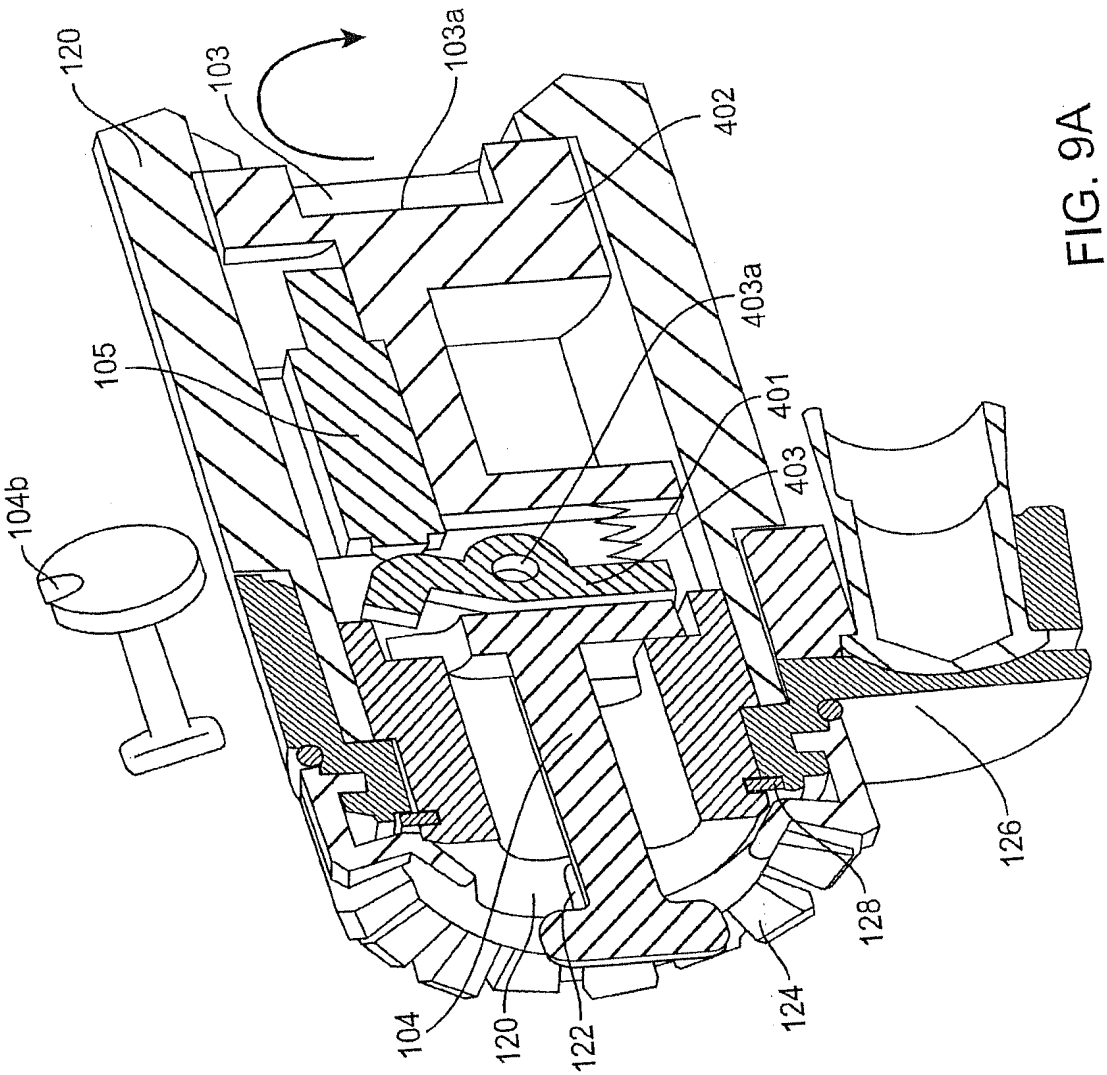


FIG. 9A

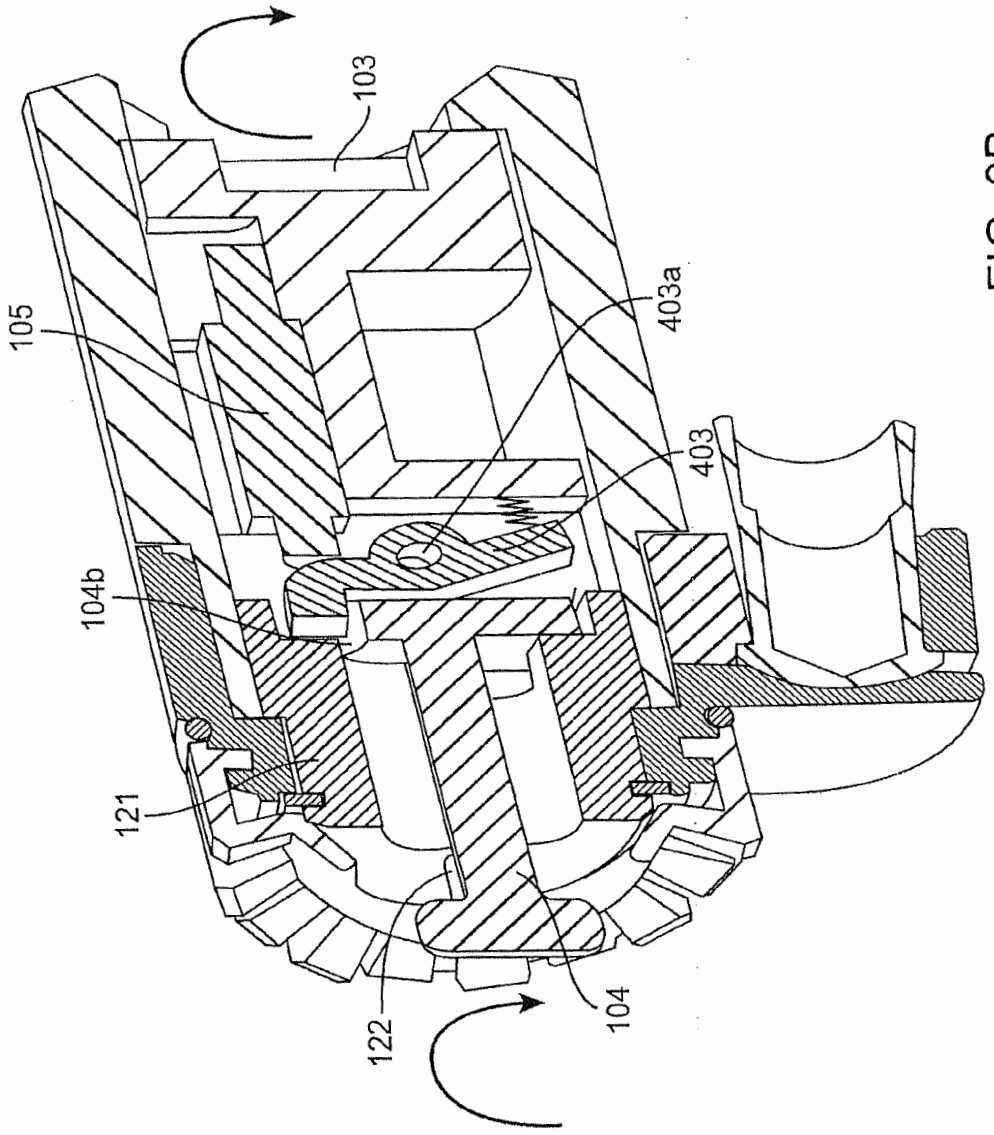


FIG. 9B

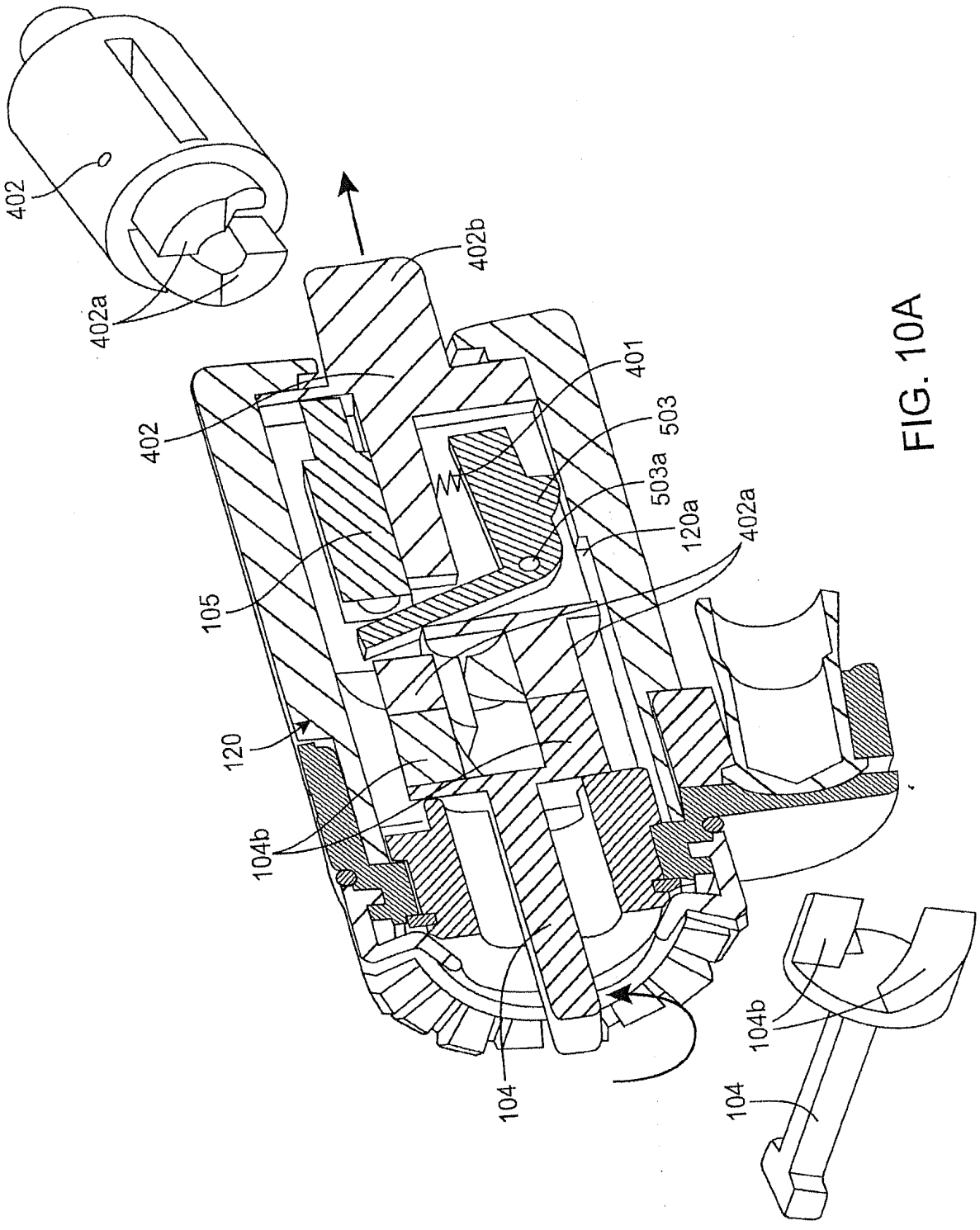


FIG. 10A

Ex. 1002 - Page 850 of 997

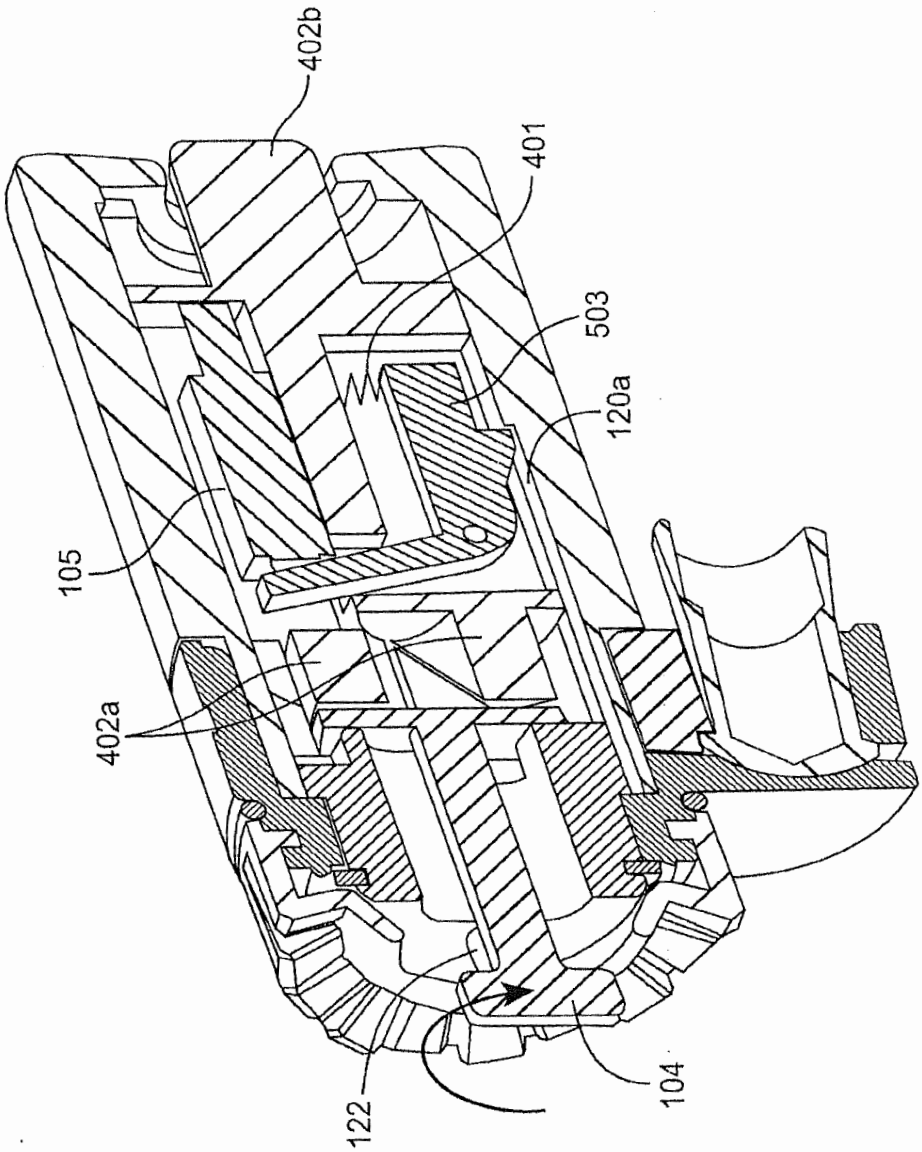


FIG. 10B

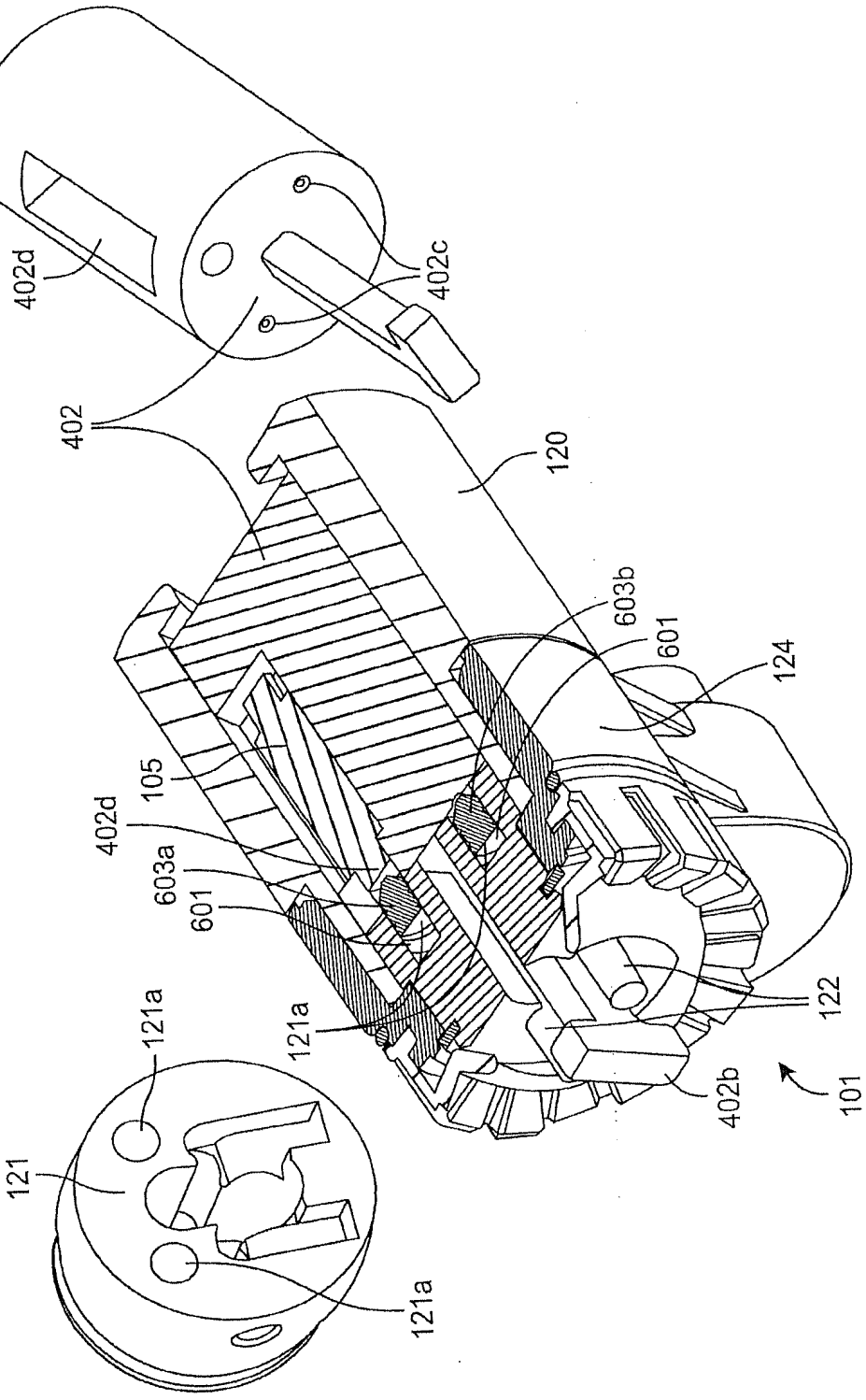

402d
402c
402
120
603b
601
124
105
402d
603a
601
121a
121a
122
121
121a
402b
101

FIG. 11A

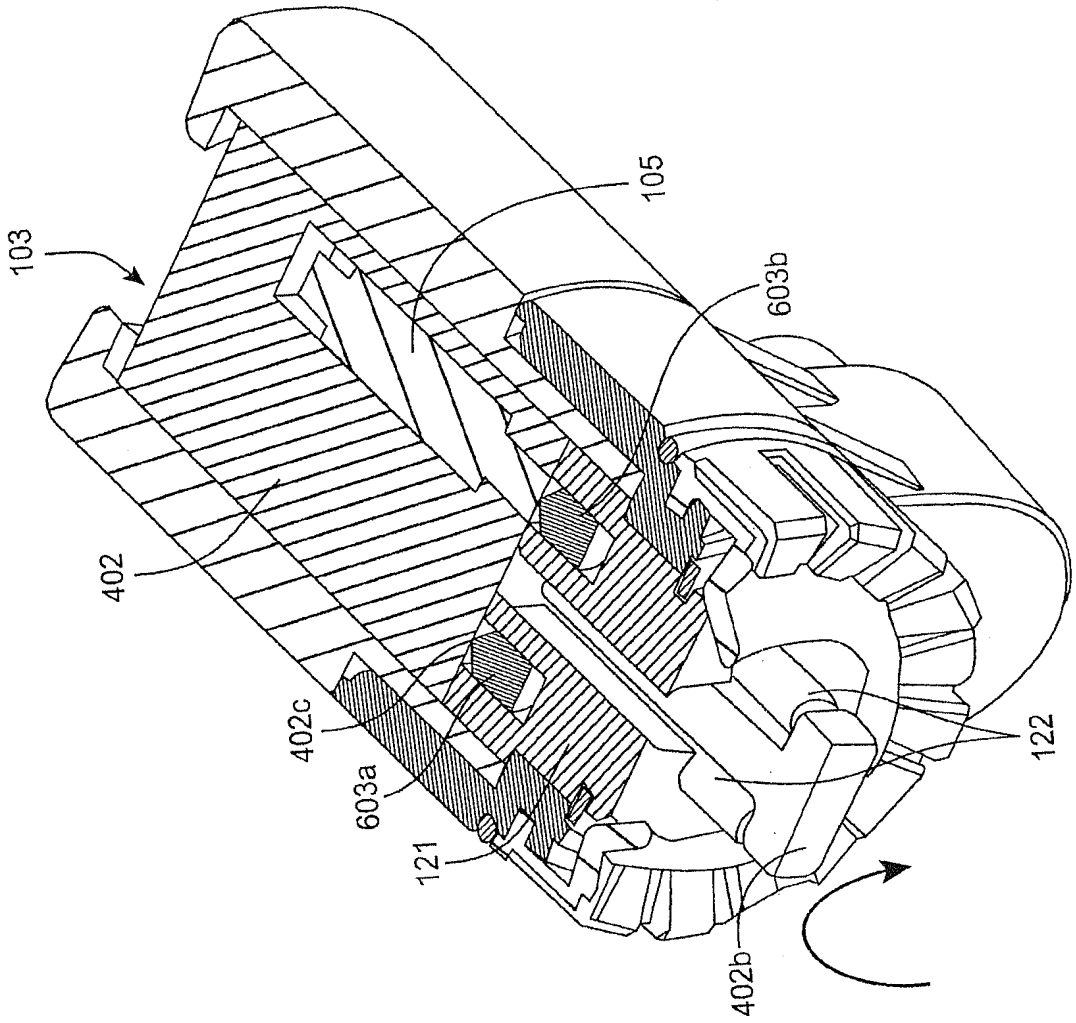


FIG. 11B

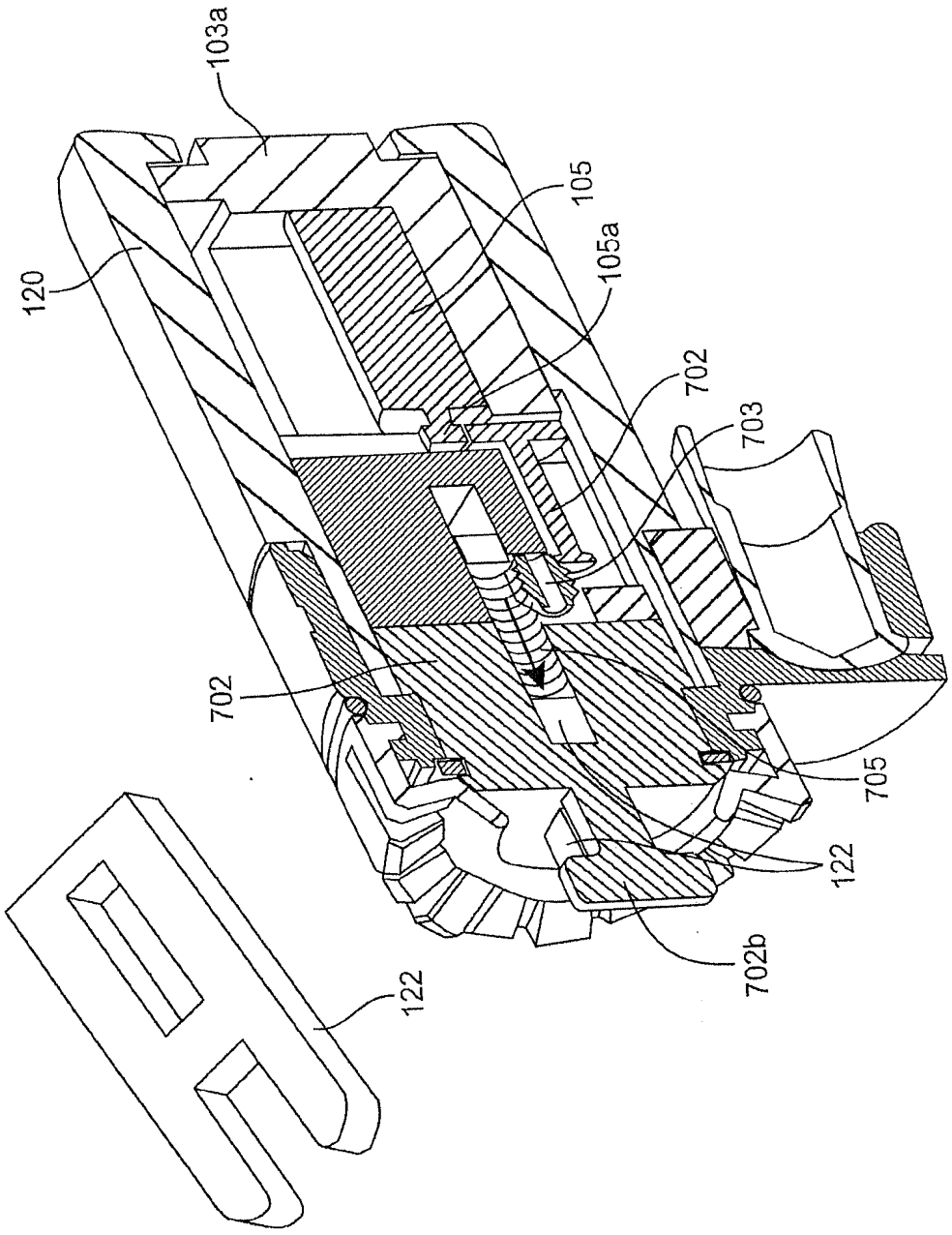


FIG. 12A

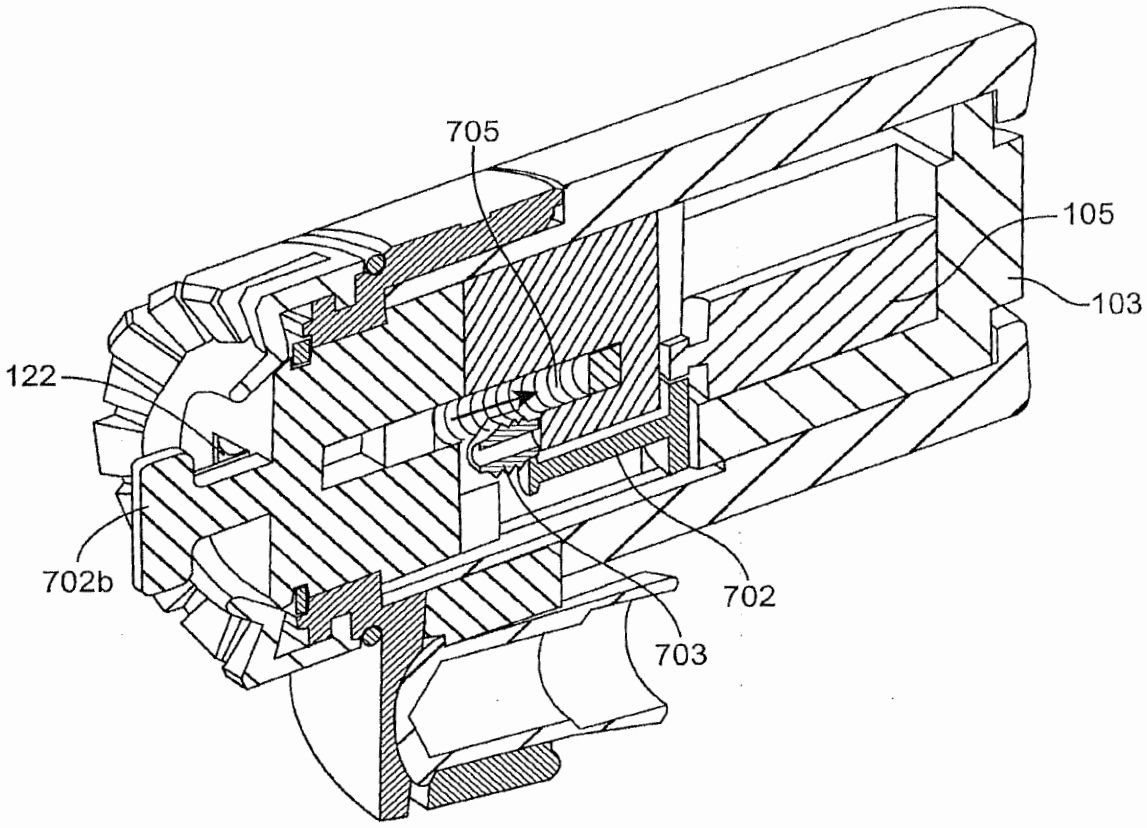


FIG. 12B

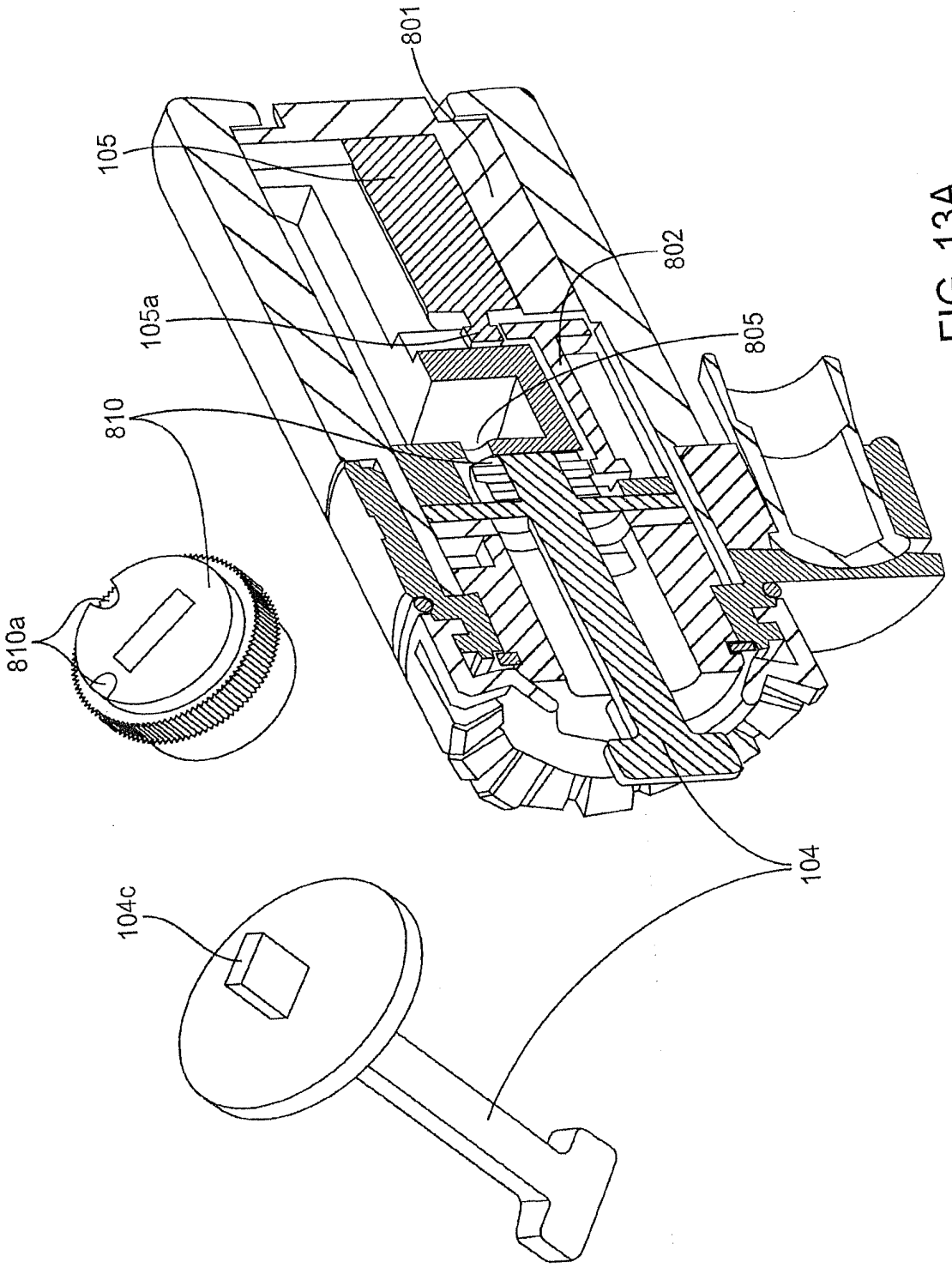


FIG. 13A

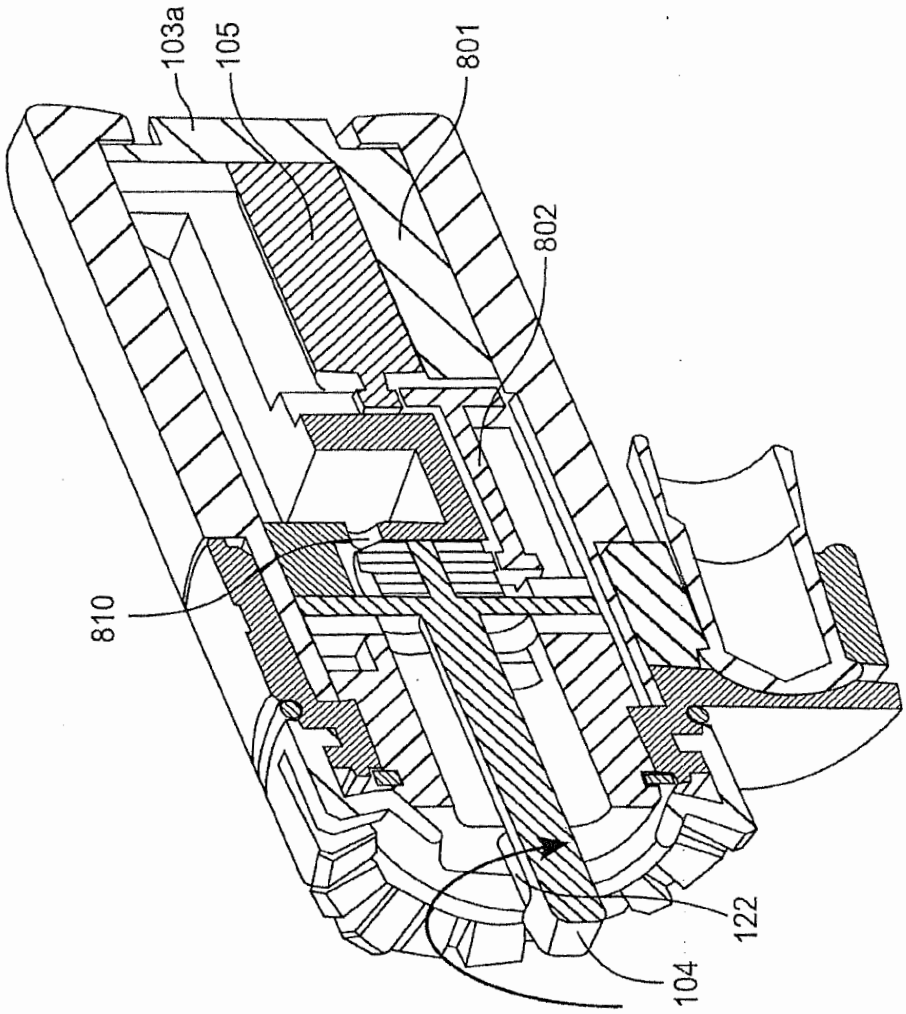


FIG. 13B

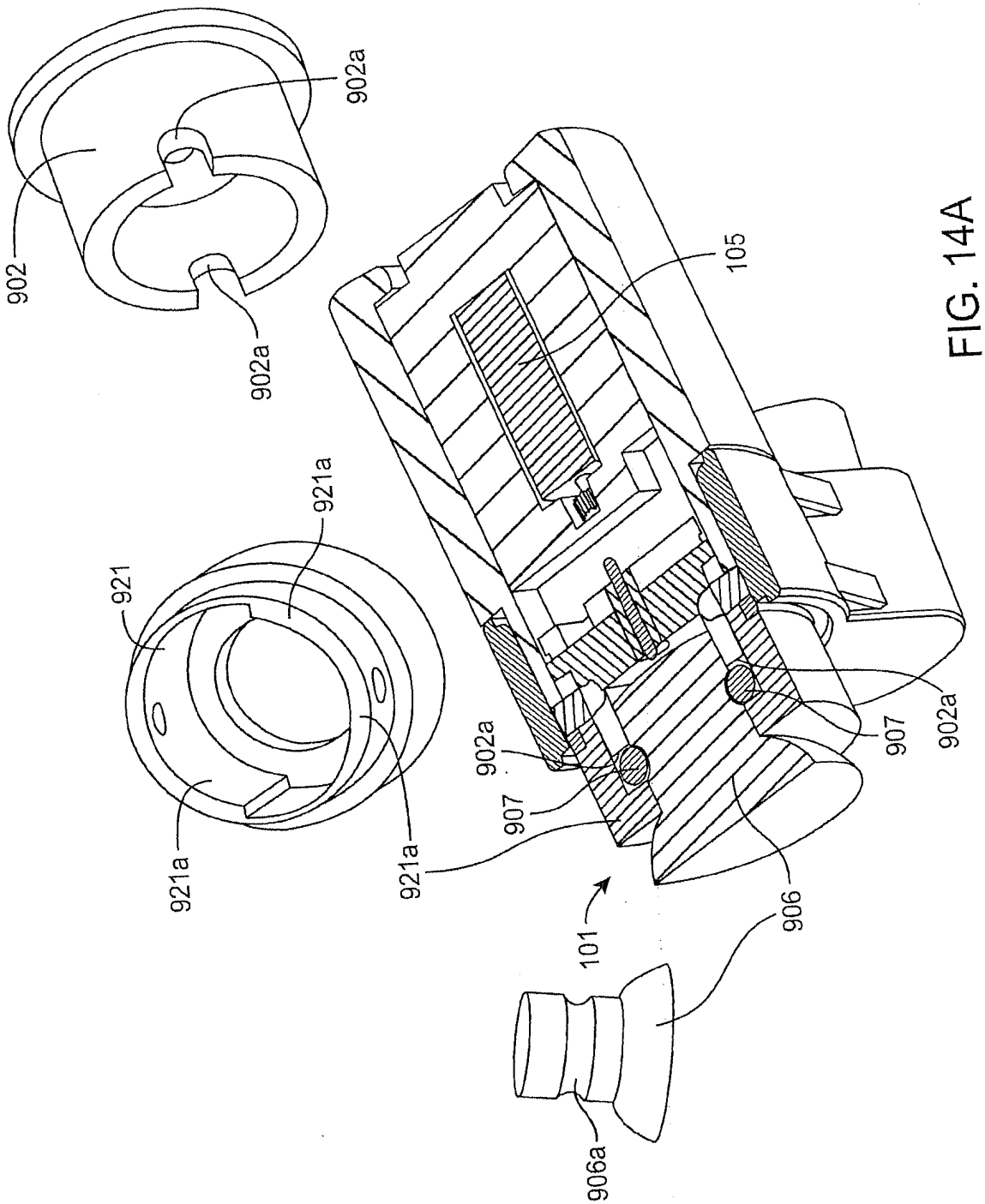

902
902a
902a
105
921a
921
921a
921a
902a
907
907
902a
101
906
906a

FIG. 14A

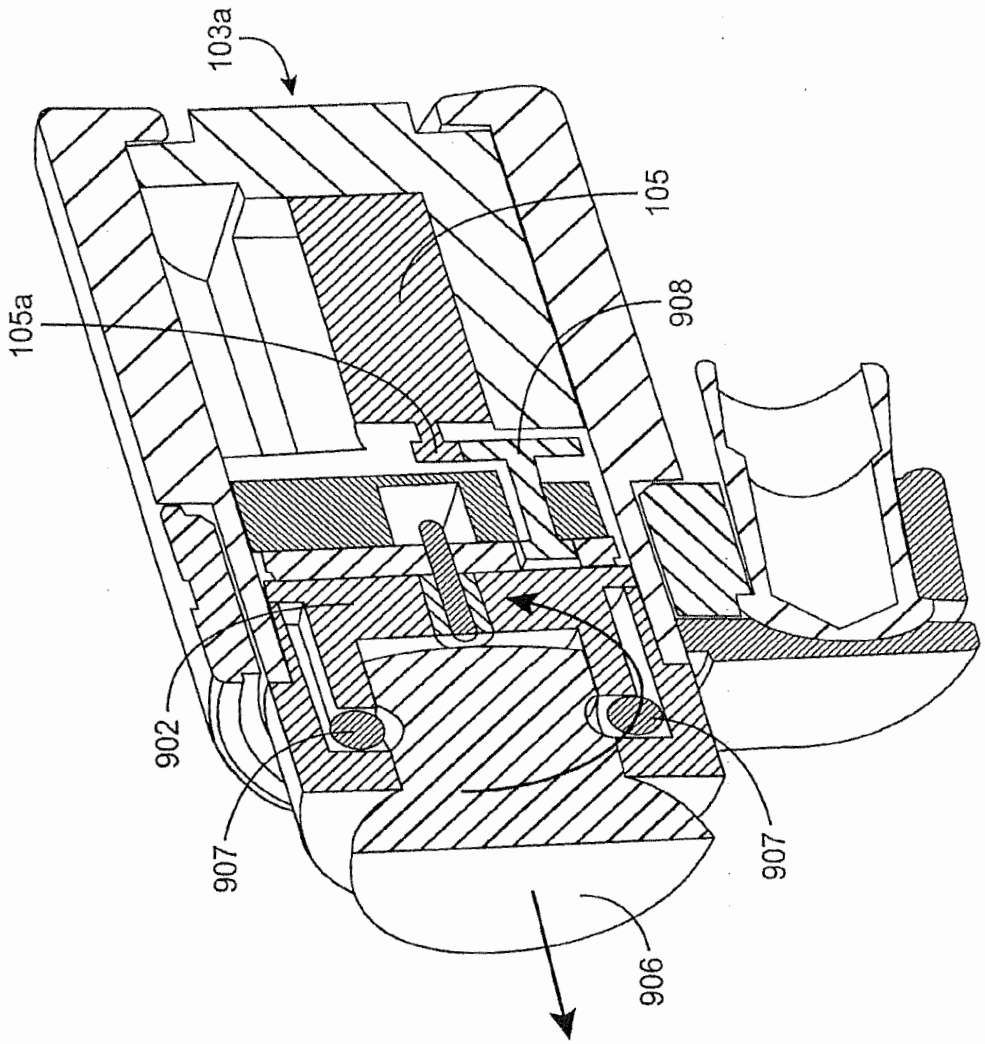


FIG. 14B

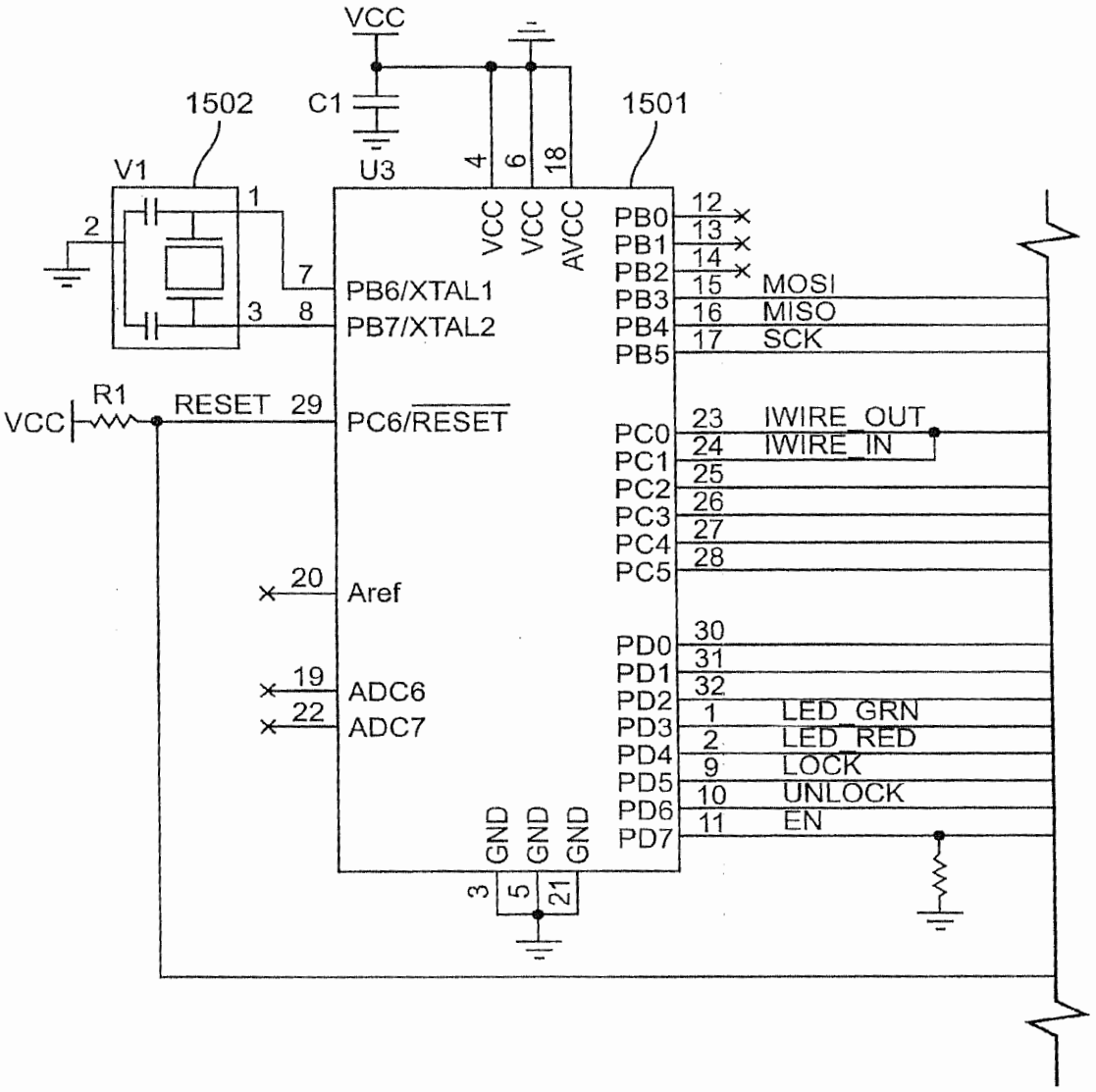

VCC
C1
1502
1501
V1
U3
4
6
18
VCC
VCC
AVCC
1
2
7
3
8
PB6/XTAL1
PB7/XTAL2
PB0
PB1
PB2
PB3
PB4
PB5
12
13
14
15
16
17
MOSI
MISO
SCK
R1
VCC
RESET
29
PC6/RESET
PC0
PC1
PC2
PC3
PC4
PC5
23
24
25
26
27
28
IWIRE_OUT
IWIRE_IN
20
Aref
19
ADC6
22
ADC7
PD0
PD1
PD2
PD3
PD4
PD5
PD6
PD7
30
31
32
1
2
9
10
11
LED_GRN
LED_RED
LOCK
UNLOCK
EN
GND
GND
GND
3
5
21

FIG. 15A

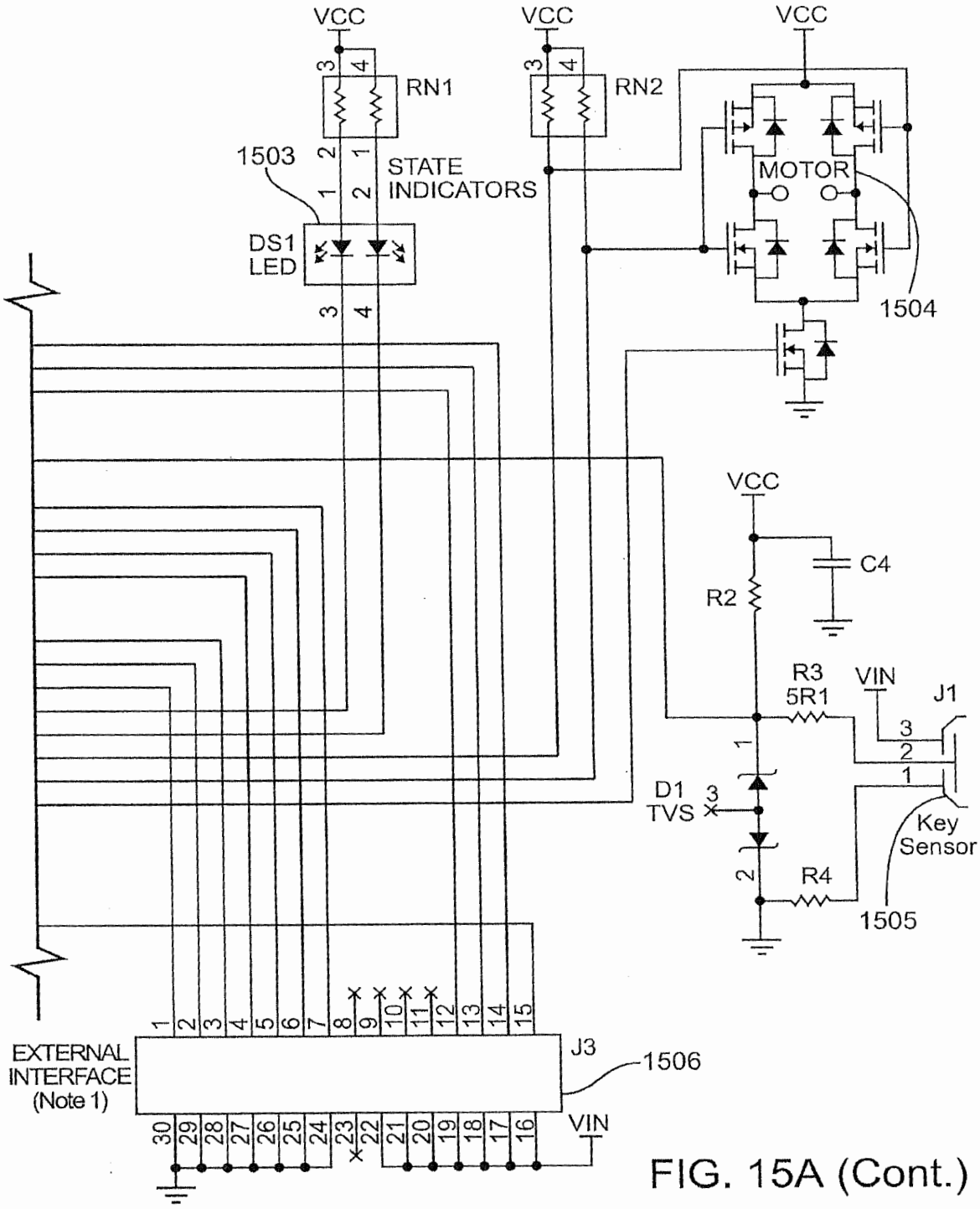

VCC
VCC
VCC
RN1
RN2
1503
STATE
INDICATORS
DS1
LED
MOTOR
1504
VCC
C4
R2
R3
5R1
VIN
J1
D1
TVS
Key
Sensor
R4
1505
EXTERNAL
INTERFACE
(Note 1)
J3
1506
VIN

FIG. 15A (Cont.)

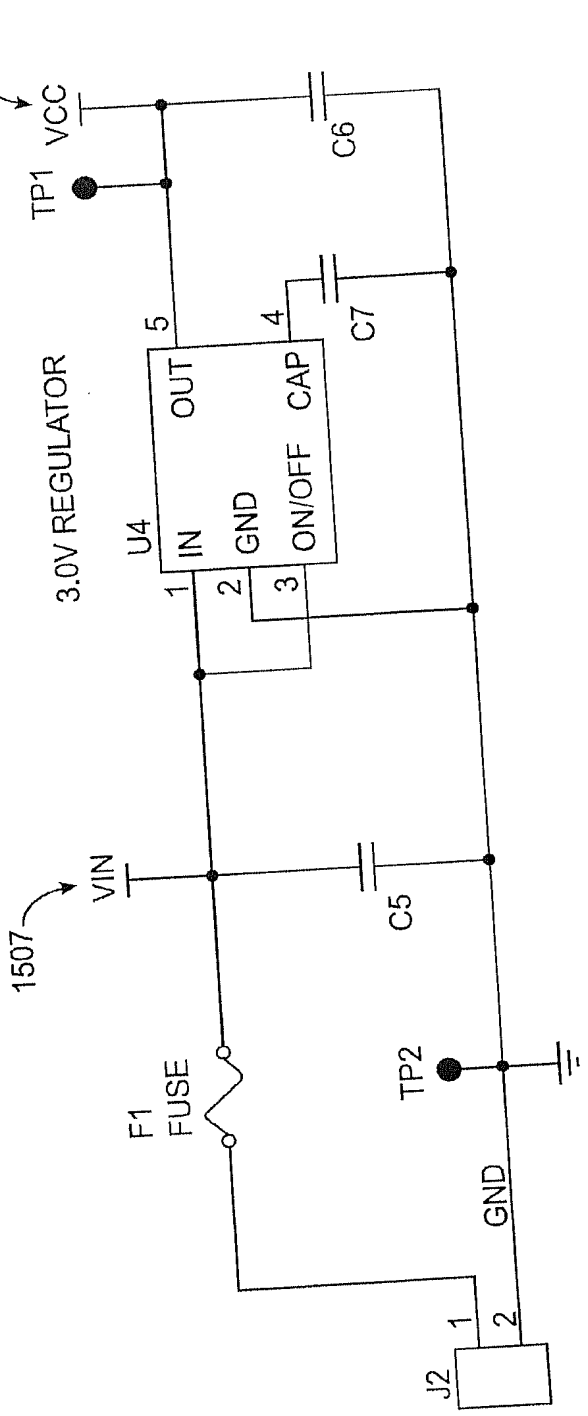


FIG. 15B

Ex. 1002 - Page 862 of 997

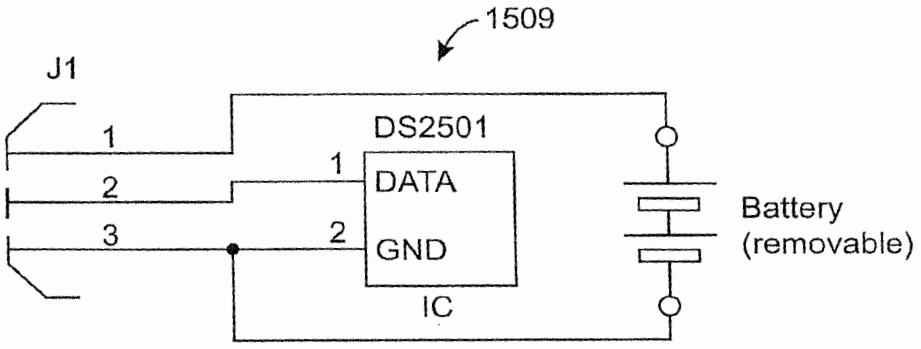


FIG. 15C

Electronic Acknowledgement Receipt

EFS ID:	13364576
Application Number:	13526514
International Application Number:	
Confirmation Number:	7327
Title of Invention:	LOCKING ASSEMBLY FOR ELECTRONIC TABLET AND OTHER DEVICES
First Named Inventor/Applicant Name:	Peter Allen
Customer Number:	4988
Filer:	Alfred M. Walker
Filer Authorized By:	
Attorney Docket Number:	120616 Allen TAB Plug CON
Receipt Date:	27-JUL-2012
Filing Date:	18-JUN-2012
Time Stamp:	19:34:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	WO9615347Kensington.pdf	2561853 846af3d956f6e99035db7fd28b4b4cbee719558a	no	48

Warnings:	
Information:	

2	Foreign Reference	WO2008051919AccoBrands.pdf	3725918 4baf2d51697f3e0157c2bb52ee793cf0a686da7e	no	101
Warnings:					
Information:					
3	Foreign Reference	WO2008051930AccoBrands.pdf	1847879 bd30f21b21c8a6f1b3ecebc6ff128bdbb852d317	no	30
Warnings:					
Information:					
4	Foreign Reference	WO2008147818AccoBrands.pdf	1356376 506b2a062b5fa41692ec450575d0893382c47d8d	no	28
Warnings:					
Information:					
5	Foreign Reference	WO2009026225AccoBrands.pdf	99713 24218b7f99bc7ab8cad21a8e17bcd58b86a04b03	no	2
Warnings:					
Information:					
6	Foreign Reference	WO2010080402AccoBrands.pdf	2496771 4cfe9e5f3e90a6f437beea58e25643d9977c9917	no	54
Warnings:					
Information:					
		Total Files Size (in bytes):	12088510		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/526,514	06/18/2012	Peter Allen	120616 Allen TAB Plug CON

CONFIRMATION NO. 7327

4988
ALFRED M. WALKER
225 OLD COUNTRY ROAD
MELVILLE, NY 11747-2712

PUBLICATION NOTICE



Title:LOCKING ASSEMBLY FOR ELECTRONIC TABLET AND OTHER DEVICES

Publication No.US-2012-0272693-A1
Publication Date:11/01/2012

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13526514
Filing Date	2012-06-18
First Named Inventor	Peter Allen
Art Unit	3673
Examiner Name	
Attorney Docket Number	120616 Allen TAB Plug CON

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5926092	A	1999-07-00	Kim	entire document
	2	6182481	B1	2001-02-00	Nagy	entire document
	3	6788216	B2	2004-09-07	Chen	entire document
	4	5760690	A	1998-06-02	French	entire document

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13526514
	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	3673
	Examiner Name	
	Attorney Docket Number	120616 Allen TAB Plug CON

	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13526514
	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	3673
	Examiner Name	
	Attorney Docket Number	120616 Allen TAB Plug CON

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Alfred M. Walker/	Date (YYYY-MM-DD)	2013-02-08
Name/Print	Alfred M. Walker	Registration Number	29983

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	14913386
Application Number:	13526514
International Application Number:	
Confirmation Number:	7327
Title of Invention:	LOCKING ASSEMBLY FOR ELECTRONIC TABLET AND OTHER DEVICES
First Named Inventor/Applicant Name:	Peter Allen
Customer Number:	4988
Filer:	Alfred M. Walker
Filer Authorized By:	
Attorney Docket Number:	120616 Allen TAB Plug CON
Receipt Date:	08-FEB-2013
Filing Date:	18-JUN-2012
Time Stamp:	13:47:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	2-8-13_IDS.pdf	612482 52166c6c15045ae99d87aacf08ddf0e258eb42e4	no	4

Warnings:	
Information:	

Total Files Size (in bytes):	612482

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/526,514	06/18/2012	Peter Allen	120616 Allen TAB Plug CON	7327

4988 7590 05/22/2013

ALFRED M. WALKER
225 OLD COUNTRY ROAD
MELVILLE, NY 11747-2712

EXAMINER	
HAUGHTON, ANTHONY MICHAEL	
ART UNIT	PAPER NUMBER
2835	
MAIL DATE	DELIVERY MODE
05/22/2013	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 13/526,514	Applicant(s) ALLEN, PETER	
	Examiner ANTHONY HAUGHTON	Art Unit 2835	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 June 2012*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-22* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-22* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *18 June 2012* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some * c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Interim copies:

a)☐ All b)☐ Some c)☐ None of the: Interim copies of the priority documents have been received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/27/2012; 2/8/2013*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of 35 U.S.C. 112(b):

(B) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claim 16** is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

3. **Claim 16** recites the limitation "security rod an spike" in line 13 of the claim. The claim earlier states that the element is either a security rod or spike, and it isn't possible for it to be both at the same time. Appropriate correction is required and for purposes of examination the claim will be interpreted as being either the rod or spike.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. **Claims 1-7, 13, 14, 16-18, 21, and 22** are rejected under 35 U.S.C. 102(b) as being anticipated by Murray Jr. (5,502,989).

Regarding Claim 1: Murray teaches a locking assembly for securing a portable electronic device having at least one housing to a substantially immovable object, the locking assembly comprising: a captive security rod (118) having a locking end (116) and an anchoring end (124), wherein the anchoring end is passed through the at least one housing to anchor the captive security rod thereto (figs. 13a-13b); and a locking device (90) with a locking mechanism (fig. 12), wherein the locking device is configured to receive the locking end of the captive security rod to activate the locking mechanism and thereby lock the security rod and portable electronic device to the locking device (figs. 11-13b).

Regarding Claim 2: Murray teaches means for securing the locking device and, therefore, the captive security rod and portable electronic device to which the captive security rod is anchored, to a substantially non-movable object (figs. 11-13b).

Regarding Claim 3: Murray teaches wherein the means for securing is a cable or lanyard (32).

Regarding Claim 4: Murray teaches the cable or lanyard is permanently attached to the locking device (figs. 11-12).

Regarding Claim 5: Murray teaches wherein the locking end of the captive security rod comprises a knob (116) that extends from the at least one housing after the anchoring end anchors the captive security rod thereto (figs. 11-13b).

Regarding Claim 6: Murray teaches wherein the small knob that is captured and held by the locking mechanism at locking actuation (figs. 11-13b).

Regarding Claim 7: Murray teaches wherein the captive security rod, upon anchoring to the at least one housing of the portable electronic device is stored in a recess and grasped to deploy in an extended position (figs. 11-13b).

Regarding Claim 13: Murray teaches wherein the cable or lanyard has a loop (figs. 23b-24b) opposite its end permanently attached to the locking device through which the locking device is passed after the cable is wrapped around the substantially immovable object (figs. 23b-24b) wherein after the locking device is lockingly attached to the captive security rod and, therefore, the portable electronic device to which the captive security rod is anchored (figs. 23b-24b).

Regarding Claim 14: Murray teaches wherein the locking device is a pin lock (Figs. 11-13b).

Regarding Claim 16: Murray teaches a locking assembly for securing a portable electronic device having a housing to a substantially immovable object, the locking assembly comprising: a security rod or spike (46 in fig. 4) having a protruding end (50), an anchoring end (54) opposite the protruding end and a transverse hole (68) positioned between the protruding end the anchoring end (fig. 4), wherein the anchoring end is configured for passing through an opening in the housing to anchor the security rod to the portable electronic device while leaving the transverse hole exposed (figs. 10a-10b); a cable (fig. 10b) with a first end and a second end, wherein the second end is configured for secure fastening to the substantially immovable object (abstract); and a locking device configured with an opening for receiving the first end of the cable after it is passed through the transverse hole of the security rod or spike (fig. 23b), wherein an

actuating mechanism in the locking device captures the first end of the cable to lock security rod and spike and, therefore, the portable electronic device to the which the security rod is anchored, to the substantially immovable object (figs. 10-10b, and 23a-24b).

Regarding Claim 17: Murray teaches wherein the first end of the cable is formed as a ferrule configured with a locking groove (figs. 23b), and wherein the actuating mechanism captures the ferrule groove upon insertion of the first end of the cable into the lock device to actuate the locking mechanism (figs. 23b).

Regarding Claim 18: Murray teaches wherein after anchoring to the housing, the portion of the security rod or spike including the transverse hole and protruding end is always exposed (figs. 10a-10b and 23a).

Regarding Claim 21: Murray teaches wherein the locking device is a pin lock (fig. 19).

Regarding Claim 22: Murray teaches the method of claim 22 inherently through the structural limitation shown above.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims 8-11, 19, and 20** rejected under 35 U.S.C. 103(a) as being unpatentable over Murray Jr. (5,502,989) as applied to the claims above, and further in view of Katoh (5,526,226).

Regarding Claim 8: Murray lacks a specific teaching of the locking end of the captive security rod operates to collapse into the at least one housing during non-use.

Katoh teaches an electronic device with a locking end of the captive security rod operates to collapse into the at least one housing during non-use (figs. 1 and 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Murray by having locking end of the captive security rod operates to collapse into the at least one housing during non-use as disclosed by Katoh in order to allow for an easier way to secure and lock the device without any added features needed to be brought with the users.

Regarding Claim 9: Murray lacks a specific teaching of the portable electronic device comprises any of the group consisting of a laptop computer, a notebook computer, and tablet computer, a cell phone, a camera, a Smartphone, a music storage and a playback device.

Katoh teaches the portable electronic device comprises any of the group consisting of a laptop computer, a notebook computer, and tablet computer, a cell phone, a camera, a Smartphone, a music storage and a playback device (figs. 7).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Murray by having the portable electronic device comprises any of the group consisting of a laptop computer, a notebook computer, and tablet computer, a cell phone, a camera, a Smartphone, a music storage and a playback device as disclosed by Katoh in order to allow the user more versatility of bringing the device with them wherever they go.

Regarding Claim 10: Murray lacks a teaching of the portable electronic device comprises a first housing, a second housing and a hinge, wherein said hinge separates and allows said first housing to be closed upon said second housing and wherein said captive security rod is deployed to extend and protrude from any surface of said first housing or said second housing.

Katoh teaches the portable electronic device comprises a first housing, a second housing and a hinge, wherein said hinge separates and allows said first housing to be closed upon said second housing and wherein said captive security rod is deployed to extend and protrude from any surface of said first housing or said second housing (figs. 1-3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Murray by having the portable electronic device comprises a first housing, a second housing and a hinge, wherein said hinge separates and allows said first housing to be closed upon said second housing and wherein said captive security rod is deployed to extend and protrude from any surface of said first housing or said second housing as disclosed by Katoh in order to allow the user more versatility of bringing the device with them wherever they go. **Regarding Claim 11:** Murray lacks a teaching of the second housing is a keyboard part and said captive security rod is inserted through and anchored, and operates to extend in a deployed position out of a surface of said second housing.

Katoh teaches the second housing is a keyboard part and said captive security rod is inserted through and anchored, and operates to extend in a deployed position out of a surface of said second housing (figs. 1 and 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Murray by having the second housing is a keyboard part and said captive security rod is inserted through and anchored, and operates to extend in a deployed position out of a surface of said second housing as disclosed by Katoh in order to allow the user more versatility of bringing the device with them wherever they go.

Regarding Claim 19: Murray lacks a teaching of the portable electronic device comprises a first housing, a second housing and a hinge, wherein said hinge separates and allows said first housing to be closed upon said second housing after the security rod is anchored to either the first or the second housing.

Katoh teaches the portable electronic device comprises a first housing, a second housing and a hinge, wherein said hinge separates and allows said first housing to be closed upon said second housing after the security rod is anchored to either the first or the second housing (figs. 1-3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Murray by having the portable electronic device comprises a first housing, a second housing and a hinge, wherein said hinge separates and allows said first housing to be closed upon said second housing after the security rod is anchored to either the first or the second housing as disclosed by Katoh

in order to allow the user more versatility of bringing the device with them wherever they go.

Regarding Claim 20: Murray lacks a teaching of the second housing is a keyboard part and said captive security rod is fixedly inserted through a surface of said second housing.

Katoh teaches the second housing is a keyboard part and said captive security rod is fixedly inserted through a surface of said second housing (fig. 7).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Murray by having the second housing is a keyboard part and said captive security rod is fixedly inserted through a surface of said second housing as disclosed by Katoh in order to allow the user the versatility of inputting data to the device without the need for adding an external feature to the device.

8. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over Murray Jr. (5,502,989) as applied to the claims above, and further in view of Greenfield (5,709,110).

Regarding Claim 12: Murray lacks a teaching of the substantially immovable object being a base plate.

Greenfield teaches a locking device for an electronic device (fig. 1) wherein the substantially immovable object being a base plate (fig. 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Murray by having the substantially

immovable object being a base plate as disclosed by Greenfield in order to allow the user the ability to lock the device to the current working table they are working on at the time of using the device increasing the versatility of where they can use and lock the device.

9. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Murray Jr. (5,502,989) as applied to the claims above, and further in view of Slow (5,608,605).

Regarding Claim 15: Murray lacks a teaching of the locking device is a plunger-type security lock.

Slow teaches a locking device for an electronic device (fig. 5) the locking device is a plunger-type security lock (fig. 7).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Murray by having the locking device is a plunger-type security lock as disclosed by Slow since this is a well-known and used product in locking electronic type devices and would allow the user to safely and securely lock the device without worry of the device being stolen or broken.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY HAUGHTON whose telephone number is (571)272-9087. The examiner can normally be reached on 7:30 - 4:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jinhee J. Lee can be reached on 571-272-1977. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anthony M Haughton/
Primary Examiner, Art Unit 2835

Notice of References Cited	Application/Control No. 13/526,514	Applicant(s)/Patent Under Reexamination ALLEN, PETER	
	Examiner ANTHONY HAUGHTON	Art Unit 2835	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,735,990	05-2004	Murray et al.	70/58
*	B	US-5,526,226	06-1996	Katoh et al.	361/679.09
*	C	US-5,502,989	04-1996	Murray et al.	70/58
*	D	US-5,608,605	03-1997	Siow et al.	361/679.43
*	E	US-6,182,481	02-2001	Nagy, Neil Frank	70/58
*	F	US-5,709,110	01-1998	Greenfield et al.	70/58
*	G	US-8,111,511	02-2012	Ruch et al.	361/679.57
*	H	US-8,107,236	01-2012	Lin, Yu-Yuan	361/679.57
*	I	US-5,709,110	01-1998	Greenfield et al.	70/58
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13526514
Filing Date	2012-06-18
First Named Inventor	Peter Allen
Art Unit	2835
Examiner Name	to be assigned
Attorney Docket Number	120616 Allen TAB Plug CON

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	D405348	S	1999-02-00	Orr	entire document
	2	D415950	S	1999-11-00	Anderson	entire document
	3	D425402	S	2000-05-00	Welborn	entire document
	4	D436310	S	2001-01-00	Arnold	entire document
	5	D485060	S	2004-01-00	DeCotis	entire document
	6	D491009	S	2004-06-00	Burdett	entire document
	7	D499546	S	2004-12-00	Smithers	entire document
	8	D503532	S	2005-04-00	Andre	entire document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

	9	D519731	S	2006-05-00	Andre	entire document
	10	D521232	S	2006-05-00	Andre	entire document
	11	D533994	S	2006-12-00	Hussaini	entire document
	12	D553352	S	2007-10-23	Allen	entire document
	13	D559076	S	2008-01-00	Allen	entire document
	14	D565839	S	2008-04-08	Allen	entire document
	15	4009599	A	1977-03-01	Patriquin	entire document
	16	5082232	A	1992-01-00	Wilson	entire document
	17	5154456	A	1992-10-00	Moore	entire document
	18	5446618	A	1995-08-00	Tetsuya	entire document
	19	5502989	A	1996-04-00	Murray	entire document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514	13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2012-06-18	
(Not for submission under 37 CFR 1.99)	First Named Inventor	Peter Allen	
	Art Unit	2835	
	Examiner Name	to be assigned	
	Attorney Docket Number	120616 Allen TAB Plug CON	

	20	5526226	A	1996-06-00	Katoh	entire document
	21	6735990	B2	2004-05-00	Murray	entire document
	22	6920770	B2	2005-07-26	Lurie	entire document
	23	7409842	B2	2008-08-12	Kuo	entire document
	24	7647796	B2	2010-01-19	Francke	entire document
	25	8111511	B2	2012-01-00	Ruch	entire document

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20010049949	A1	2001-12-13	Iglemund	entire document
	2	20050150263	A1	2005-07-00	Murray	entire document
	3	20050178173	A1	2005-08-18	Kuo	entire document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514	13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18	
	First Named Inventor	Peter Allen	
	Art Unit	2835	
	Examiner Name	to be assigned	
	Attorney Docket Number	120616 Allen TAB Plug CON	

	4	20060117814	A1	2006-06-08	Francke	entire document
	5	20060176661	A1	2006-08-10	Allen	entire document
	6	20080110217	A1	2008-05-15	Andrews	entire document

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	PCT201100108	WO	A1	2011-03-21	Allen	entire document	☐
	2	PCT2008067173	WO	A2	2008-06-05	Targus Group	entire document	☐
	3	08-7462	JP		1996-01-00	Matsushita	entire document	☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

EXAMINER SIGNATURE			
Examiner Signature	/Anthony Haughton/	Date Considered	05/20/2013

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Alfred M. Walker/	Date (YYYY-MM-DD)	2012-07-27
Name/Print	Alfred M. Walker	Registration Number	29,983

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13526514
Filing Date	2012-06-18
First Named Inventor	Peter Allen
Art Unit	2835
Examiner Name	to be assigned
Attorney Docket Number	120616 Allen TAB Plug CON

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	3707860	A	1973-01-02	Singer	Entire Document
	2	4738428	A	1988-04-19	Themistos	Entire Document
	3	4821538	A	1989-04-18	Gray	Entire Document
	4	4856304	A	1989-08-15	Derman	Entire Document
	5	5345219	A	1994-09-06	Rogers	Entire Document
	6	5351508	A	1994-10-04	Kelley	Entire Document
	7	5361610	A	1994-11-08	Sanders	Entire Document
	8	5406809	A	1995-04-18	Iglemund	Entire Document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514	13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2012-06-18	
(Not for submission under 37 CFR 1.99)	First Named Inventor	Peter Allen	
	Art Unit	2835	
	Examiner Name	to be assigned	
	Attorney Docket Number	120616 Allen TAB Plug CON	

	9	5608605	A	1997-03-04	Siow	Entire Document
	10	7963132	B2	2011-06-21	Andres	Entire Document

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050178173	A1	2005-08-18	Kuo	Entire Document

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	454901	CA		1949-03-08	Forester	Entire Document	☐
	2	791364	CA		1968-08-06	Myatt	Entire Document	☐
	3	987121	CA		1976-04-13	Foote	Entire Document	☐
	4	329934	DE		1920-12-01	Tappe	Entire Document	☐

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

	5	335741	DE		1921-04-11	Otto	Entire Document	☐
	6	361068	DE		1923-04-28	Ritter	Entire Document	☐
	7	456219	DE		1928-02-18	Ritter	Entire Document	☐
	8	577757	DE		1933-06-03	Herkrath	Entire Document	☐
	9	3202700	DE		1983-04-08	Fricke	Entire Document	☐
	10	3407723	DE		1985-09-05	Rimanek	Entire Document	☐
	11	3824393	DE		1989-07-27	Rimanek	Entire Document	☐
	12	455740	FR		1913-08-07	Driesen	Entire Document	☐
	13	877220	FR		1942-12-01	Houzel	Entire Document	☐
	14	1026519	FR		1953-04-28	Bouquet	Entire Document	☐
	15	1085107	FR		1955-01-27	Boucher	Entire Document	☐

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

	16	2308006	FR		1976-11-12	Hartwell	Entire Document	☐
	17	2636686	FR		1990-03-23	Lalanne	Entire Document	☐
	18	2741375	FR		1997-05-23	Ronis SA	Entire Document	☐
	19	4470901	GB		1936-05-12	Hochstadt	Entire Document	☐
	20	1256295	GB		1971-12-08	Myatt	Entire Document	☐
	21	1376011	GB		1974-12-04	Walters	Entire Document	☐
	22	2109109	GB		1983-05-26	Honda	Entire Document	☐
	23	2234856	GB		1991-02-13	Volumatic	Entire Document	☐
	24	P0000398	HU		2000-06-28	Pataco	Entire Document	☐
	25	224329	HU		2003-06-30	Safeframe	Entire Document	☐
	26	451949	IT		1949-03-26	Deitinger	Entire Document	☐

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

	27	49-91096	JP		1947-11-00	Uknown	Entire Document	☐
	28	37-7592	JP		1959-06-00	Uknown	Entire Document	☐
	29	52-36813	JP		1977-03-00	Uknown	Entire Document	☐
	30	57-25092	JP		1982-02-00	Koei Metal	Entire Document	☐
	31	57-179618	JP		1982-11-00	Koei Metal	Entire Document	☐
	32	087462	JP		1996-01-00	Matsushita	Entire Document	☐
	33	2000-305845	JP		2000-11-00	IBM	Entire Document	☐
	34	2000-140948	JP		2005-05-00	Maezawa	Entire Document	☐
	35	14095	NO		1905-05-00	Nielsen	Entire Document	☐
	36	WO86/00396	WO	A1	1986-01-16	Waterglade	Entire Document	☐
	37	WO93/15295	WO	A1	1993-08-05	Kensington	Entire Document	☐

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514	13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18	
	First Named Inventor	Peter Allen	
	Art Unit	2835	
	Examiner Name	to be assigned	
	Attorney Docket Number	120616 Allen TAB Plug CON	

	38	WO95/10680	WO	A1	1995-05-20	Kensington	Entire Document	☐
	39	WO96/07002	WO	A1	1996-03-07	Kensington	Entire Document	☐
	40	WO9615347	WO	A1	1996-05-23	Kensington	Entire Document	☐
	41	WO2008/051919	WO	A2	2008-05-02	Acco Brands	Entire Document	☐
	42	WO2008/051930	WO	A2	2008-05-02	Acco Brands	Entire Document	☐
	43	WO2008/147818	WO	A1	2008-12-04	Acco Brands	Entire Document	☐
	44	WO2009/026225	WO	A1	2009-02-26	Acco Brands	Entire Document	☐
	45	WO2010/080402	WO	A1	2010-07-15	Acco Brands	Entire Document	☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514	13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18	
	First Named Inventor	Peter Allen	
	Art Unit	2835	
	Examiner Name	to be assigned	
	Attorney Docket Number	120616 Allen TAB Plug CON	

	2		☐
	3		☐

If you wish to add additional non-patent literature document citation information please click the Add button **Add**

EXAMINER SIGNATURE

Examiner Signature	/Anthony Haughton/	Date Considered	05/20/2013

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Alfred M. Walker/	Date (YYYY-MM-DD)	2012-07-27
Name/Print	Alfred M. Walker	Registration Number	29,983

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 7327

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/526,514	06/18/2012	361	2835	120616 Allen TAB Plug CON

APPLICANTS

Peter Allen, Locust Valley, NY;

**** CONTINUING DATA ***************************

This application is a CON of 13/031,174 02/18/2011 PAT 8223488 *
which is a CIP of 12/657,670 01/25/2010 PAT 8139356 *
which is a CIP of 12/154,561 05/23/2008 PAT 7724520 *
which is a CIP of 11/454,433 06/15/2006 PAT 7443665 *
which is a CIP of 11/359,871 02/22/2006 PAT 7324333 *
which claims benefit of 60/655,270 02/22/2005
and claims benefit of 60/678,911 05/06/2005
and said 11/454,433 06/15/2006
claims benefit of 60/691,476 06/17/2005
and claims benefit of 60/725,333 10/11/2005
and claims benefit of 60/757,737 01/10/2006
and claims benefit of 60/783,188 03/16/2006
(*)Data provided by applicant is not consistent with PTO records.

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

06/27/2012

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /ANTHONY MICHAEL HAUGHTON/ Examiner's Signature	☐ Met after Allowance /AMH/ Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		NY	41	22	3

ADDRESS

ALFRED M. WALKER
225 OLD COUNTRY ROAD
MELVILLE, NY 11747-2712
UNITED STATES

TITLE

LOCKING ASSEMBLY FOR ELECTRONIC TABLET AND OTHER DEVICES

FILING FEE RECEIVED		
1370	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13526514	ALLEN, PETER
	Examiner	**Art Unit**
	ANTHONY HAUGHTON	2835

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	05/20/2013								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
	10	✓								
	11	✓								
	12	✓								
	13	✓								
	14	✓								
	15	✓								
	16	✓								
	17	✓								
	18	✓								
	19	✓								
	20	✓								
	21	✓								
	22	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13526514	ALLEN, PETER
	Examiner	Art Unit
	ANTHONY HAUGHTON	2835

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
361	679.57	5/20/2013	AMH
312	221.1, 221.2	5/20/2013	AMH

SEARCH NOTES		
Search Notes	Date	Examiner
east saerch (see search notes)	5/20/2013	AMH
inventor search	5/20/2013	AMH

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

	/ANTHONY HAUGHTON/ Primary Examiner.Art Unit 2835

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed
PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13526514
Filing Date	2012-06-18
First Named Inventor	Peter Allen
Art Unit	2835
Examiner Name	to be assigned
Attorney Docket Number	120616 Allen TAB Plug CON

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6237375	B1	2001-05-00	Wymer	entire document
	2	62575542	B1	2001-07-00	Westfield	entire document
	3	6275378	B1	2001-08-00	Lee	entire document
	4	6308928	B1	2001-10-00	Galant	entire document
	5	6317936	B1	2001-11-00	McDaid	entire document
	6	6331934	B1	2001-12-00	Helot	entire document
	7	6427499	B1	2002-08-00	Derman	entire document
	8	6443417	B2	2002-09-00	Galant	entire document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2012-06-18
(Not for submission under 37 CFR 1.99)	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

	9	6477871	B1	2002-11-00	Derman	entire document
	10	6477871	B1	2002-11-00	Shaw	entire document
	11	6497125	B1	2002-12-00	Necchi	entire document
	12	6560710	B1	2003-05-00	Leyden	entire document
	13	6578394	B2	2003-06-00	Yin	entire document
	14	6581420	B1	2003-06-00	Ling	entire document
	15	6590767	B2	2003-07-00	Liao	entire document
	16	6612455	B2	2003-09-00	Byme	entire document
	17	6684548	B1	2004-02-00	Petrus	entire document
	18	6689954	B2	2004-02-00	Vaughan	entire document
	19	6697252	B2	2004-02-00	Maeda	entire document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

	20	6705133	B1	2004-03-00	Avganim	entire document
	21	6708966	B1	2004-03-00	Troudt	entire document
	22	6711921	B1	2004-03-00	Yang	entire document
	23	6735990	B1	2004-05-00	Murray	entire document
	24	6755056	B2	2004-06-00	Igelmund	entire document
	25	6763690	B2	2004-07-00	Galant	entire document
	26	6788216	B2	2004-09-00	Sevier	entire document
	27	6796536	B1	2004-09-00	Sevier	entire document
	28	6810698	B2	2004-11-00	Weinraub	entire document
	29	6820362	B1	2004-11-00	Petrus	entire document
	30	68659144	B2	2005-03-00	Irgens	entire document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514	13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2012-06-18	
(Not for submission under 37 CFR 1.99)	First Named Inventor	Peter Allen	
	Art Unit	2835	
	Examiner Name	to be assigned	
	Attorney Docket Number	120616 Allen TAB Plug CON	

	31	6913238	B2	2005-07-00	Bakker	entire document
	32	6926141	B2	2005-08-00	Montler	entire document
	33	7007912	B1	2006-03-00	Giuliani	entire document
	34	7107093	B2	2006-12-00	Ling	entire document
	35	7255228	B2	2007-08-00	Kim	entire document
	36	73154432	B2	2008-01-01	Allen	entire document
	37	7443665	B2	2008-10-28	Allen	entire document
	38	7499269	B2	2009-03-03	Allen	entire document
	39	7499270	B2	2009-03-03	Allen	entire document

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514	13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18	
	First Named Inventor	Peter Allen	
	Art Unit	2835	
	Examiner Name	to be assigned	
	Attorney Docket Number	120616 Allen TAB Plug CON	

	1	20030085125	A1	2003-05-00	Yatabe	entire document
	2	20040007651	A1	2004-01-00	Williams	entire document
	3	20040161557	A1	2005-07-00	Heintz	entire document
	4	20050150263	A1	2005-07-00	Murray	entire document
	5	20050247584	A1	2005-11-00	Lu	entire document
	6	20060032877	A1	2006-02-00	Obolo	entire document
	7	20070205125	A1	2007-09-00	Ikebe	entire document
	8	20070235493	A1	2007-10-00	Fortson	entire document

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

NON-PATENT LITERATURE DOCUMENTS			Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button **Add**

EXAMINER SIGNATURE			
Examiner Signature	/Anthony Haughton/	Date Considered	05/20/2013

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Alfred M. Walker/	Date (YYYY-MM-DD)	2012-07-27
Name/Print	Alfred M. Walker	Registration Number	29,983

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13526514
Filing Date	2012-06-18
First Named Inventor	Peter Allen
Art Unit	2835
Examiner Name	to be assigned
Attorney Docket Number	120616 Allen TAB Plug CON

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	3181319	A	1965-05-00	Hudon	entire document
	2	3275160	A	1966-09-00	Zurker	entire document
	3	3410122	A	1968-11-00	Moses	entire document
	4	3410580	A	1968-11-00	Longenecker	entire document
	5	3535898	A	1970-10-00	Allport	entire document
	6	RE28187	E	1974-10-00	Longenecker	entire document
	7	3945227	A	1976-03-00	Reiland	entire document
	8	3965705	A	1976-06-00	Nadler	entire document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2012-06-18
(Not for submission under 37 CFR 1.99)	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

	9	4066231	A	1978-01-00	Bahner	entire document
	10	4418553	A	1983-12-00	Applegate	entire document
	11	4426863	A	1984-01-00	Gillette	entire document
	12	4696449	A	1987-09-00	Woo	entire document
	13	4733840	A	1988-03-00	D'Amore	entire document
	14	4870842	A	1989-10-00	Plumer	entire document
	15	5052198	A	1991-10-00	Watts	entire document
	16	5052199	A	1991-10-00	Derman	entire document
	17	5076079	A	1991-12-00	Monoson	entire document
	18	5085395	A	1992-02-00	Frater	entire document
	19	5135197	A	1992-08-00	Kelley	entire document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2012-06-18
(Not for submission under 37 CFR 1.99)	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

	20	5169114	A	1992-12-00	O'Neil	entire document
	21	5265449	A	1993-11-00	Rashleigh	entire document
	22	5351507	A	1994-10-00	Derman	entire document
	23	5381685	A	1995-01-00	Carl	entire document
	24	5469726	A	1995-11-00	Rushing	entire document
	25	5493878	A	1996-02-00	Murray	entire document
	26	5502989	A	1996-04-00	Murray	entire document
	27	5531082	A	1996-07-00	Wolk	entire document
	28	5542723	A	1996-08-00	Scharf	entire document
	29	5560481	A	1996-10-00	Doodson	entire document
	30	5568359	A	1996-10-00	Cavello	entire document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

	31	5582044	A	1996-12-00	Bolich	entire document
	32	5595074	A	1997-01-00	Munro	entire document
	33	5645261	A	1997-07-00	Glynn	entire document
	34	5709110	A	1998-01-00	Greenfield	entire document
	35	5762306	A	1998-06-00	Day	entire document
	36	5787738	A	1998-08-00	Brandt	entire document
	37	5787739	A	1998-08-00	Derman	entire document
	38	5794463	A	1998-08-00	McDaid	entire document
	39	5816076	A	1998-10-00	Biedermann	entire document
	40	5836183	A	1998-11-00	Derman	entire document
	41	5927108	A	1999-07-00	Pierce	entire document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514	13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2012-06-18	
(Not for submission under 37 CFR 1.99)	First Named Inventor	Peter Allen	
	Art Unit	2835	
	Examiner Name	to be assigned	
	Attorney Docket Number	120616 Allen TAB Plug CON	

	42	6000252	A	1999-12-00	Murray	entire document
	43	6006557	A	1999-12-00	Carl	entire document
	44	6138483	A	2000-10-00	Galant	entire document
	45	6155088	A	2000-12-00	Murray	entire document
	46	6178089	B2	2001-01-00	Alfonso	entire document
	47	6182481	B2	2001-02-00	Nagy	entire document
	48	6185964	B2	2001-02-00	Addiego	entire document
	49	6212921	B2	2001-04-00	Knighton	entire document
	50	6216499	B2	2004-04-00	Ronberg	entire document

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13526514 13526514 - GAU: 2835
Filing Date	2012-06-18
First Named Inventor	Peter Allen
Art Unit	2835
Examiner Name	to be assigned
Attorney Docket Number	120616 Allen TAB Plug CON

	1					

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2002149264	JP	A	2002-05-24	Toshiba Corp.	entire document	☐
	2	2004318426	JP	A	2004-11-11	Miwa Lock Co. Ltd.	entire document	☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/Anthony Haughton/	Date Considered	05/20/2013

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Alfred M. Walker/	Date (YYYY-MM-DD)	2012-07-27
Name/Print	Alfred M. Walker	Registration Number	29,983

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	0	312/221.1.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 12:45
L2	0	312/221.2.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 12:45
L3	430	361/679.57.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 12:46
L4	1	"5502989".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 12:52
L5	26	(US-20060117814-$ or US-20050150263-$ or US-20010049949-$ or US-20080110217-$ or US-20100320884-$).did. or (US-6182481-$ or US-6178089-$ or US-5502989-$ or US-5493878-$ or US-5082232-$ or US-6788216-$ or US-5787738-$ or US-5709110-$ or US-6257542-$ or US-6755056-$ or US-6735990-$ or US-6578394-$ or US-5608605-$ or US-5361610-$ or US-8111511-$ or US-8107236-$ or US-5526226-$ or US-5446618-$ or US-5675998-$ or US-5154456-$ or US-7355845-$).did.	US-PGPUB; USPAT	OR	OFF	2013/05/20 13:13
L6	0	5 and ((pin near lock) or pinlock)	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 13:13
L7	2	5 and ((pin near5 lock) or pinlock)	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 13:13
S1	1	"6182481".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:17
S2	1	"6178089".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:18
S3	1	"5502989".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:18

S4	1	"5493878".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:18
S5	1	"5787735".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:18
S6	1	"5082232".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:18
S7	6	S1 S2 S3 S4 S5 S6	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:18
S8	29	("0153673" | "1707225" | "4313319" | "4359646" | "4924683" | "5351508" | "5406809" | "5447045" | "5450271" | "5526226" | "5594419" | "5595074" | "5709110" | "5757616" | "5787738" | "5819561" | "5870281" | "5960651" | "5987937" | "6000252").PN. OR ("6182481").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:18
S9	28	("4252007" | "4453692" | "4585202" | "4613109" | "4656848" | "4729614" | "4733840" | "4946127" | "5154456" | "5228319" | "5288049" | "5361610" | "5381685" | "5398530" | "5493878" | "5502989" | "5519572" | "5604663" | "5631449" | "5668882" | "5682290" | "5697233" | "5701347" | "5987937").PN. OR ("6178089").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:22
S10	8	(US-6182481-$ or US-6178089-$ or US-5502989-$ or US-5493878-$ or US-5082232-$ or US-6788216-$ or US-5787738-$ or US-5709110-$).did.	USPAT	OR	OFF	2008/06/06 13:43
S11	4	S10 and (laptop or (lap adj top) or notebook)	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:44
S12	1	"6257542".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:45
S13	1	"5595074".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:58
S14	1	"5493878".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:58
S15	2	S13 S14	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:58
S16	1	"3945227".pn.	US-PGPUB;	OR	OFF	2008/06/06 14:49

			USPAT; USOCR			
S17	1	"5787738".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 14:49
S18	2	S16 S17	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 14:49
S19	1	"20050247584"	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 14:52
S20	1	"6926141".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 14:53
S21	3940	361/683.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 08:46
S22	865	257/727.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 08:46
S23	1258	312/223.2.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 08:46
S24	536	211/8,9.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 08:46
S25	2637	312/223.3,351.3-351.9,215-221,208.3,208.3.CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 08:55
S27	4345	361/679-681.CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 08:55
S28	122621	LOCK.CLM.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:00
S29	6588	(laptop or (lap adj top) or (notebook adj computer)).clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:01
S30	569324	base.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:01
S31	72025	clamp.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:01

S32	197948	pin.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:01
S33	270089	hole.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:01
S34	7336	ferrule.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:01
S35	6933	chord.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:02
S36	111841	cable.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:02
S37	22498	knob.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:02
S38	120510	screw.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:02
S39	32877	tighten$3.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:02
S40	185607	recess.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:02
S41	72439	hinge.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:02
S42	15350	S30 S31	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S43	2355	S32 S42	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S44	7	S29 S43	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S45	320	S29 S41	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S46	38	S45 S36	US-PGPUB; USPAT;	AND	OFF	2008/06/09 09:03

			USOCR			
S47	4941	S36 S31	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S48	118602	S35 or S36	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S49	1099	S48 S37	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S50	167	S49 S38	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:04
S51	2924	S37 S38	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:04
S52	484	S51 S40	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:04
S53	1	S45 S35	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:04
S54	310	S51 S39	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:04
S55	52	S52 S54	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:04
S56	9080	S32 S31	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S57	2	S56 S45	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S58	963	S51 S33	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S59	197	S58 S40	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S60	119	S58 S39	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S61	35	S58 S36	US-	AND	OFF	2008/06/09

			PGPUB; USPAT; USOCR			09:05
S62	0	S58 S35	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S63	118602	S35 or S36	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S64	171152	base.clm.	US-PGPUB	OR	OFF	2008/06/09 09:06
S65	16418	clamp.clm.	US-PGPUB	OR	OFF	2008/06/09 09:06
S66	47184	pin.clm.	US-PGPUB	OR	OFF	2008/06/09 09:07
S67	2104	ferrule.clm.	US-PGPUB	OR	OFF	2008/06/09 09:07
S68	90891	hole.clm.	US-PGPUB	OR	OFF	2008/06/09 09:07
S69	35210	(chord or cable).clm.	US-PGPUB	OR	OFF	2008/06/09 09:07
S70	5767	knob.clm.	US-PGPUB	OR	OFF	2008/06/09 09:07
S71	31456	screw.clm.	US-PGPUB	OR	OFF	2008/06/09 09:07
S72	7874	tighten$3.clm.	US-PGPUB	OR	OFF	2008/06/09 09:07
S73	46415	recess.clm.	US-PGPUB	OR	OFF	2008/06/09 09:08
S74	19963	hinge.clm.	US-PGPUB	OR	OFF	2008/06/09 09:08
S75	4477	(laptop or (lap adj top) or (notebook adj computer)).clm.	US-PGPUB	OR	OFF	2008/06/09 09:08
S76	70	S75 S74 S64	US-PGPUB	AND	OFF	2008/06/09 09:08
S77	160	S74 S75	US-PGPUB	AND	OFF	2008/06/09 09:09
S78	698	S70 S73	US-PGPUB	AND	OFF	2008/06/09 09:09
S79	238	S68 S78	US-PGPUB	AND	OFF	2008/06/09 09:09
S80	1	S77 S79	US-PGPUB	AND	OFF	2008/06/09 09:09
S81	7	S65 S77	US-PGPUB	AND	OFF	2008/06/09 09:09
S82	2056	S65 S66	US-PGPUB	AND	OFF	2008/06/09 09:09
S83	84	S65 S67	US-PGPUB	AND	OFF	2008/06/09 09:09
S84	15	S82 S83	US-PGPUB	AND	OFF	2008/06/09 09:09
S85	1	S77 S84	US-PGPUB	AND	OFF	2008/06/09 09:09

S86	1960	S65 S71	US-PGPUB	AND	OFF	2008/06/09 09:10
S87	2	S77 S86	US-PGPUB	AND	OFF	2008/06/09 09:10
S88	1119	S69 S65	US-PGPUB	AND	OFF	2008/06/09 09:10
S89	2	S88 S77	US-PGPUB	AND	OFF	2008/06/09 09:10
S90	1863	S71 S72	US-PGPUB	AND	OFF	2008/06/09 09:11
S91	317	S65 S90	US-PGPUB	AND	OFF	2008/06/09 09:11
S92	86	S70 S90	US-PGPUB	AND	OFF	2008/06/09 09:11
S93	317	S71 S91	US-PGPUB	AND	OFF	2008/06/09 09:11
S94	86	S71 S92	US-PGPUB	AND	OFF	2008/06/09 09:11
S95	2	S93 S77	US-PGPUB	AND	OFF	2008/06/09 09:11
S96	0	S94 S77	US-PGPUB	AND	OFF	2008/06/09 09:11
S97	137	("4009599" | "3965705" | "5052198" | "5351507" | "5502989" | "5568359" | "RE28187" | "20070205125" | "6308928" | "6443417" | "6497125" | "6926141" | "D425402" | "D553352" | "D565839" | "3181319" | "3410580" | "3945227" | "4696449" | "5052199" | "5085395" | "5469726" | "5582044" | "5595074" | "5709110" | "6178089" | "6212921" | "6216499" | "20040007651" | "20050247584" | "2575542" | "6581420" | "6820362" | "7107093" | "7255228" | "D436310" | "D499546" | "6182481" | "6317936" | "6578394" | "6590767" | "6612455" | "6708966" | "6755056" | "6788216" | "D491009" | "D559076" | "4856304" | "7963132" | "20010049949" | "20060176661" | "5794463" | "5927108" | "20050150263" | "6275378" | "6427499" | "6763690" | "7007912" | "7499269" | "20050178173" | "5608605" | "20050178173" | "6920770" | "7409842" | "7647796" | "3410122" | "4870842" | "5381685" | "5493878" | "5816076" | "5836183" | "6138483" | "6155088" | "6185964" | "6697252" | "7499270" | "D415950" | "D485060" | "D503532" | "5351508" | "5406809" | "5076079" | "5135197" | "5265449" | "5542723" | "5645261" | "5787739" | "6796536" | "3154432" | "20080110217" | "4738428" | "4821538" | "3275160" | "4066231" | "4733840" | "5169114" | "5531082" | "5560481" | "5762306" | "5787738" | "6000252" | "20030085125" | "20040161557" | "20060032877" | "6237375" | "6331934" | "6684548" | "6705133" | "6735990" | "6810698" |	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 11:59

		"7443665" | "D519731" | "20060117814" | "3535898" | "4418553" | "4426863" | "6006557" | "20070235493" | "6477871" | "6560710" | "6689954" | "6711921" | "8659144" | "6913238" | "D405348" | "D521232" | "D533994" | "5082232" | "3707860" | "5345219" | "5361610").PN.				
S98	1	"7443665".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 14:10
S99	1	"7324333".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 14:11
S100	8	("5327752" | "6112562" | "7101203" | "5240218" | "5915690" | "5381685" | "5502989" | "6975224").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 14:41
S101	67	("4027798" | "4308733" | "4365280" | "4640106" | "4685312" | "4733840" | "4738428" | "4794587" | "4856304" | "4918952" | "4924683" | "4964285" | "5117661" | "5136862").PN. OR ("5361610").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 15:32
S102	67	("4027798" | "4308733" | "4365280" | "4640106" | "4685312" | "4733840" | "4738428" | "4794587" | "4856304" | "4918952" | "4924683" | "4964285" | "5117661" | "5136862").PN. OR ("5361610").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 15:36
S103	41	("4616490" | "4655057").PN. OR ("5608605").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 15:36
S104	14	("20080220812" | "20090001116" | "5351508" | "5361610" | "5446618" | "5447044" | "5447045" | "5526226" | "5787738" | "5960651" | "6178089" | "6244082" | "6389854" | "6788216").PN. OR ("8111511").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 15:37
S105	22	("20040112098" | "20060243006" | "20060266086" | "20100142135" | "20100206018" | "20100320884" | "3599453" | "3707860" | "3965705" | "4353521" | "4843848" | "5288049" | "5361610" | "5547236" | "5608605" | "5787738" | "5944550" | "5987937" | "6006557" | "6094949" | "6742366" | "7431322").PN. OR ("8107236").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 15:44
S106	40	("5154456" | "5264986" | "5446618").PN. OR ("5526226").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 15:45
S107	42	("4777812" | "4941841" | "5051868" | "5154456" | "5228319").PN. OR ("5446618").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 15:47
S108	554559	display.clm.	US-PGPUB;	OR	OFF	2012/05/18 07:40

			USPAT; USOCR			
S109	267	haughton.xa.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/18 07:40
S110	93	S109 and display.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/18 07:40
S111	1	S110 and seal$3.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/18 07:40
S112	141	S109 and display	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/18 07:47
S113	19	S112 and seal$3	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/18 07:47
S114	267	haughton.xa.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/29 18:25
S115	4	S114 and flexible near display	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/29 18:25
S116	4	S114 and (flexible near display)	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/29 18:25
S117	321	257/731.CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/06/19 09:36
S118	2	"20100009247"	US-PGPUB; USPAT; USOCR	OR	OFF	2012/06/19 11:27
S119	143	("3965705" | "5052198" | "5351507" | "5502989" | "5568359" | "RE28187" | "D425402" | "D553352" | "D565839" | "20070205125" | "6308928" | "6443417" | "6497125" | "6926141" | "3181319" | "3410580" | "3945227" | "4696449" | "5052199" | "5085395" | "5469726" | "5582044" | "5595074" | "5709110" | "6178089" | "6212921" | "6216499" | "8111511" | "D436310" | "D499546" | "20040007651" | "20050247584" | "2575542" | "6581420" | "6820362" | "7107093" | "7255228" | "6182481" | "4856304" | "7963132" | "5154456" | "7409842" | "D491009" | "D559076" | "6317936" | "6578394" | "6590767" | "6612455" | "6708966" | "6755056" | "6788216" | "5926092" | "5794463" |	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 09:57

		"5927108" | "20050178173" | "5608605" | "20010049949" | "20050150263" | "20060117814" | "6920770" | "7647796" | "6275378" | "6427499" | "6763690" | "7007912" | "7499269" | "3410122" | "4870842" | "5381685" | "5493878" | "5816076" | "5836183" | "6138483" | "6155088" | "6185964" | "5351508" | "5406809" | "D415950" | "D485060" | "D503532" | "6697252" | "7499270" | "5076079" | "5135197" | "5265449" | "5542723" | "5645261" | "5787739" | "4738428" | "4821538" | "4009599" | "6796536" | "3154432" | "6788216" | "3275160" | "4066231" | "4733840" | "5169114" | "5531082" | "5560481" | "5762306" | "5787738" | "6000252" | "20060176661" | "5446618" | "6735990" | "D519731" | "20030085125" | "20040161557" | "20060032877" | "6237375" | "6331934" | "6684548" | "6705133" | "6810698" | "7443665" | "5760690" | "3535898" | "4418553" | "4426863" | "6006557" | "3707860" | "5345219" | "5361610" | "20080110217" | "5082232" | "5526226" | "D405348" | "D521232" | "D533994" | "20070235493" | "6477871" | "6560710" | "6689954" | "6711921" | "8659144" | "6913238").PN.				
S120	25	(US-20060117814-$ or US-20050150263-$ or US-20010049949-$ or US-20080110217-$ or US-20100320884-$).did. or (US-6182481-$ or US-6178089-$ or US-5502989-$ or US-5493878-$ or US-5082232-$ or US-6788216-$ or US-5787738-$ or US-5709110-$ or US-6257542-$ or US-6755056-$ or US-6735990-$ or US-6578394-$ or US-5608605-$ or US-5361610-$ or US-8111511-$ or US-8107236-$ or US-5526226-$ or US-5446618-$ or US-5675998-$ or US-5154456-$).did.	US-PGPUB; USPAT	OR	OFF	2013/05/20 09:59
S121	21	S119 and S120	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 09:59
S122	20	S120 and @ad<"20050506"	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:07
S123	10606	"25" and (pin near lock)	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:22
S124	0	S120 and (pin near lock)	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:22
S125	2	S120 and (plunger)	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:22
S126	13	S120 and (pin)	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:22

S127	267	haughton.xa.	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:46
S128	128	haughton.xp.	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:46
S129	395	S127 S128	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:46
S130	1	S129 and ((HDD or (disk near drive) or (disc near drive)) with adapter)	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:47
S131	72	S129 and ((HDD or (disk near drive) or (disc near drive)))	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:47
S132	9	S131 and adapter	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:47
S133	40	S131 and connector	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:48
S134	31	S131 and ((mother or main or circuit) near board)	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:48
S135	14	S131 and ((mother or main) near board)	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:49
S136	17	S134 not S135	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:50

EAST Search History (Interference)

<This search history is empty>

5/20/2013 1:28:51 PM
C:\Users\ahaughton\Documents\EAST\Workspaces\13_\13_526514\Search 5_20.wsp

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13526514
Filing Date	2012-06-18
First Named Inventor	Peter Allen
Art Unit	3673
Examiner Name	
Attorney Docket Number	120616 Allen TAB Plug CON

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5926092	A	1999-07-00	Kim	entire document
	2	6182481	B1	2001-02-00	Nagy	entire document
	3	6788216	B2	2004-09-07	Chen	entire document
	4	5760690	A	1998-06-02	French	entire document

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 02/08/2013	Application Number	13526514	13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18	
	First Named Inventor	Peter Allen	
	Art Unit	3673	
	Examiner Name		
	Attorney Docket Number	120616 Allen TAB Plug CON	

	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/Anthony Haughton/	Date Considered	05/20/2013

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 02/08/2013	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2012-06-18
	First Named Inventor	Peter Allen
	Art Unit	3673
	Examiner Name	
	Attorney Docket Number	120616 Allen TAB Plug CON

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Alfred M. Walker/	Date (YYYY-MM-DD)	2013-02-08
Name/Print	Alfred M. Walker	Registration Number	29983

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

RECEIVED
CENTRAL FAX CENTER

NOV 2 2 2013

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:	Peter Allen
APPLICATION NO.:	13/526,514
FILED:	06/18/2012
FOR:	LOCKING ASSEMBLY FOR ELECTRONIC TABLET AND OTHER DEVICES
EXAMINER:	Haughton; Anthony Michael
GROUP ART UNIT:	2835
MAILING DATE OF ACTION:	May 22, 2013

ATTORNEY DOCKET NUMBER: 120616 Allen TAB Plug CON

Commissioner for Patents
Mail Stop Amendments
PO Box 1450
Alexandria VA 22313-1450

AMENDMENT IN RESPONSE TO FIRST OFFICE ACTION

In response to the Office Action dated May 22, 2013, Applicant amends the application as follows:

Please extend the time to respond three months to date herein. A credit card authorization is attached. Please deduct any deficiency in the fee to Applicant's attorney's deposit account 23-0120.

RECEIVED
CENTRAL FAX CENTER
NOV 2 2 2013

IN THE CLAIMS:

A complete listing of all claims and their present status is as follows:

1. (currently amended) A locking assembly for securing a portable electronic device having at least one housing to a substantially immovable object, the locking assembly comprising:

a captive security rod having a locking end and an anchoring end, wherein the anchoring end is passed through the at least one housing to anchor the captive security rod thereto;

said captive security rod being captive partially in said at least one housing and partially out of said at least one housing during and before locking use; and

a locking device with a locking mechanism, wherein the locking device is configured with an opening to receive the locking end of the captive security rod to activate the locking mechanism, where the activation causes the locking mechanism to securely grasp the locking end and thereby lock the security rod and portable electronic device to the locking device.

2. (original) The locking assembly as set forth in claim 1, further comprising means for securing the locking device and, therefore, the captive security rod and portable electronic device to which the captive security rod is anchored, to a substantially non-movable object.

3. (original) The locking assembly as set forth in claim 1, wherein the means for securing is a cable or lanyard.

4. (original) The locking assembly as set forth in claim 3, wherein the cable or lanyard is permanently attached to the locking device.

PAGE 2/10 * RCVD AT 11/22/2013 11:56:13 AM [Eastern Standard Time] * SVR:IW-PTOFAX-001/3 * DNIS:2738300 * CSID:631 361 8792 * DURATION (mm-ss):01-54

5. (original) The locking assembly as set forth in claim 1, wherein the locking end of the captive security rod comprises a knob that extends from the at least one housing after the anchoring end anchors the captive security rod thereto.

6. (original) The locking assembly as set forth in claim 5, wherein the small knob that is captured and held by the locking mechanism at locking actuation.

7. (original) The locking assembly as set forth in claim 1, wherein the captive security rod, upon anchoring to the at least one housing of the portable electronic device is stored in a recess and grasped to deploy in an extended position.

8. (original) The locking assembly as set forth in claim 1, wherein the locking end of the captive security rod operates to collapse into the at least one housing during non-use.

9. (original) The locking assembly as set forth in claim 1, wherein said portable electronic device comprises any of the group consisting of a laptop computer, a notebook computer, and tablet computer, a cell phone, a camera, a Smartphone, a music storage and a playback device.

10. (original) The locking assembly as set forth in claim 1, wherein said portable electronic device comprises a first housing, a second housing and a hinge, wherein said hinge separates and allows said first housing to be closed upon said second housing and wherein said captive security rod is deployed to extend and protrude from any surface of said first housing or said second housing.

11. (original) The locking assembly as set forth in claim 10, wherein said second housing is a keyboard part and said captive security rod is inserted through and anchored, and operates to extend in a deployed position out of a surface of said second housing.

PAGE 3/10 * RCVD AT 11/22/2013 11:56:13 AM [Eastern Standard Time] * SVR:IW-PTOFAX-001/3 * DNIS:2738300 * CSID:631 361 8792 * DURATION (mm-ss):01-54

12. (original) The locking assembly as set forth in claim 1, wherein the substantially immovable object is a base plate.

13. (original) The locking assembly as set forth in claim 2, wherein the cable or lanyard has a loop opposite its end permanently attached to the locking device through which the locking device is passed after the cable is wrapped around the substantially immovable object whereinafter the locking device is lockingly attached to the captive security rod and, therefore, the portable electronic device to which the captive security rod is anchored.

14. (original) The locking assembly as set forth in claim 1, wherein the locking device is a pin lock.

15. (original) The locking assembly as set forth in claim 1, wherein the locking device is a plunger-type security lock.

16. (canceled)

17. (canceled)

18. (canceled)

19. (canceled)

20. (canceled)

21. (canceled)

22. (currently amended) A method for securing a portable electronic device having a housing to a substantially immovable object utilizing a locking assembly, the

PAGE 4/10 * RCVD AT 11/22/2013 11:56:13 AM [Eastern Standard Time] * SVR:IW-PTOFAX-001/3 * DNIS:2738300 * CSID:631 361 8792 * DURATION (mm-ss):01-54

locking assembly comprising a captive security rod or spike formed with an anchoring end separated axially by a protruding end, said captive security rod being captive partially in said at least one housing and partially out of said at least one housing during and before locking use; a locking device with an internal locking mechanism and a cable permanently attached to the locking device at one end, the method comprising acts of:

securedly fixing the anchoring end of the captive security rod or spike to the portable electronic device upon or through the housing;

attaching an other end of the cable to the substantially immovable object; and

inserting the protruding end of the captive security rod into an opening in the locking device to actuate the internal locking mechanism and lock the locking device to the captive security rod and, therefore, the portable electronic device to which it is anchored, to the substantially immovable object.

PAGE 5/10 * RCVD AT 11/22/2013 11:56:13 AM [Eastern Standard Time] * SVR:W-PTOFAX-001/3 * DNIS:2738300 * CSID:631 361 8792 * DURATION (mm-ss):01-54

RECEIVED
CENTRAL FAX CENTER

NOV 2 2 2013

REMARKS

Please extend the time to respond to date herein. A credit card authorization for the three month extension fee of $1400 is attached. Please deduct any deficiency in the fee, or any other applicable fee, to Applicant's attorney's deposit account number 23-0120.

Applicant's attorney thanks the Examiner for the courteous telephone interview of October 21, 2013, where the pending Claims were discussed and how Figure 30 shows a captive security rod with an axially aligned distal locking end, which is available outside of the housing even before locking deployment, while the captive security rod's anchor portion is in the housing.

The Office Action of May 22, 2013 and the references cited therein have been carefully considered and, in view of the amendments herein to the claims and the following representations, reconsideration of the application in its present form is respectfully requested.

Claims 16-21 are canceled without prejudice to renew in a continuation. Claims 1-15 and 22 are pending.

With respect to the rejections under 35 USC §102(b) and 35 USC §103, the Examiner cited US Patent number 5,502,989 of Murray at Figure 12 therein, identifying the captive security rod 118 having a locking end 116 and an anchoring end 124. In actuality Applicant respectfully disagrees and notes that the T-shaped member 124 is reality the locking end, which rectangular locking end protrudes through rectangular opening 138 in the wall 137 of the computer housing, is rotated 90 degrees to lock the computer 137 .Murray states at column 8, lines 25-29 as follows: "*Once crossmember 124 has been fully inserted through slot 138, a key 140 engaging lock mechanism 118 (See FIG. 12) is used to rotate the spindle 90° and misalign crossmember 124 and slot 138.*"

Therefore, according to Murray '989, when the user wishes to unlock the computer the reverse happens, namely, that cross member 124 is aligned with rectangular slot 138 and removed during non-use.

PAGE 6/10 * RCVD AT 11/22/2013 11:56:13 AM [Eastern Standard Time] * SVR:W-PTOFAX-001/3 * DNIS:2738300 * CSID:631 361 8792 * DURATION (mm-ss):01-54
Ex. 1002 - Page 941 of 997

Therefore also, Murray's rectangular T-shaped locking member 124 is stored out of the housing 137 during non-use and between deployments. The prior art of Murray '989 does not have a captive security rod with an axially aligned locking end portion that sticks out of the housing before locking deployment.

With respect to Fig. 23A of Murray, a locking member 840 (cable) is inserted into a hollow member 810. In contrast, as recited in Applicant's Claim 1 as amended, the "*locking device is configured with an opening to receive the locking end of the captive security rod to activate the locking mechanism, where the activation causes the locking mechanism to securely grasp the locking end.*" Applicant's Claim 22 also refer to the locking device receiving the locking end of the security rod therein. Therefore the protruding rod is received in the locking device, unlike that the locking cable of Murray's Figure 23B which is received into a hollow member 801 extending above the housing.

The bottom line with respect to independent Claims 1 and 22 is that the Murray '989 reference does not show cable 840 locking to locking end 810, or any actuation by a male end entry being received into a female lock mechanism, as is recited in Applicant's Claims 1 and 22.

In contrast, as in Applicant's amended independent Claims 1 and 22, the locking rod is partially stored in the computer housing during non-use, wherein the captive security rod being captive partially in said at least one housing and partially out of said at least one housing during and before locking use and wherein the locking end of the captive security rod is received into the locking mechanism.

Since Applicant's amended Claim 1 and 22 are distinguishable from Murray '989. the dependent Claims 2-15 are also allowable.

Moreover, the secondary art of US Patent number 5,526,226 of Katoh (lock stored entirely inside housing during non-use), US Patent number 5,709,110 of Greenfield (locking plate permanently adhered to outside of computer by adhesive glue) and US Patent number 5,608,605 of Siow (lock stored outside of the PC slot during non-use to allow storage media to be loaded therein) are also distinguishable, because they also do not disclose a captive security rod being captive partially in the computer housing and partially out of the housing during locking use and before locking use.

PAGE 7/10 * RCVD AT 11/22/2013 11:56:13 AM [Eastern Standard Time] * SVR:W-PTOFAX-001/3 * DNIS:2738300 * CSID:631 361 8792 * DURATION (mm-ss):01-54

Therefore, the rejection of the pending Claims 1-15 and 22 under 35 USC §102(b) under anticipation and/or under 35 USC §103 under obviousness should now be withdrawn.

Applicant submits that the application is in condition for allowance, which allowance is earnestly solicited.

Respectfully submitted,

Dated: November 22, 2013

Alfred M. Walker
Attorney for Applicant
Reg. No. 29,983

225 Old Country Road
Melville, NY 11747-2712
(631) 361-8737
pat4

CERTIFICATE OF FAX TRANSMISSION

I hereby certify that this correspondence is being deposited by fax to 571-273-8300 on the date indicated below.

Date: November 22, 2013

Alfred M. Walker

RECEIVED
CENTRAL FAX CENTER

NOV 2 2 2013

PTO/SB/22 (03-13)
Approved for use through 3/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) 120616 Allen TAB Plug CON
Application Number 13/526,514	Filed 06/18/2012
For LOCKING ASSEMBLY FOR ELECTRONIC TABLET AND OTHER DEVICES	
Art Unit 2835	Examiner Anthony Michael Haughton

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	Micro Entity Fee	
☐ One month (37 CFR 1.17(a)(1))	$200	$100	$50	$
☐ Two months (37 CFR 1.17(a)(2))	$600	$300	$150	$
☐ Three months (37 CFR 1.17(a)(3))	$1,400	$700	$350	$ 1400
☐ Four months (37 CFR 1.17(a)(4))	$2,200	$1,100	$550	$
☐ Five months (37 CFR 1.17(a)(5))	$3,000	$1,500	$750	$

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☑ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 230120.

☐ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71. 37 CFR 3.73(b) statement is enclosed (Form PTO/SB/96).

☑ attorney or agent of record. Registration number 29983.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

Alfred M. Walker — Signature

November 21, 2013 — Date

Alfred M. Walker — Typed or printed name

631-361-8737 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☑ * Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

RECEIVED
CENTRAL FAX CENTER

NOV 2 2 2013

PTO/SB/22 (03-13)
Approved for use through 3/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional): 120616 Allen TAB Plug CON

Application Number: 13/526,514

Filed: 06/18/2012

For: LOCKING ASSEMBLY FOR ELECTRONIC TABLET AND OTHER DEVICES

Art Unit: 2835

Examiner: Anthony Michael Haughton

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	Micro Entity Fee	
☐	One month (37 CFR 1.17(a)(1))	$200	$100	$50	$
☐	Two months (37 CFR 1.17(a)(2))	$600	$300	$150	$
☒	Three months (37 CFR 1.17(a)(3))	$1,400	$700	$350	$ 1400
☐	Four months (37 CFR 1.17(a)(4))	$2,200	$1,100	$550	$
☐	Five months (37 CFR 1.17(a)(5))	$3,000	$1,500	$750	$

11/22/2013 APEREZAM 00000017 13526514
01 FC:1253 1400.00 OP

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☑ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 230120.

☐ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71. 37 CFR 3.73(b) statement is enclosed (Form PTO/SB/96).

☑ attorney or agent of record. Registration number 29983.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

Alfred M. Walker — Signature

November 21, 2013 — Date

Alfred M. Walker — Typed or printed name

631-361-8737 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☑ * Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/526,514	Filing Date 06/18/2012	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **11/26/2013**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 16	Minus	** 22	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/JAMES MASON/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

4988 7590 12/20/2013

ALFRED M. WALKER
225 OLD COUNTRY ROAD
MELVILLE, NY 11747-2712

EXAMINER
HAUGHTON, ANTHONY MICHAEL

ART UNIT	PAPER NUMBER
2846	

DATE MAILED: 12/20/2013

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/526,514	06/18/2012	Peter Allen	120616 Allen TAB Plug CON	7327

TITLE OF INVENTION: LOCKING ASSEMBLY FOR ELECTRONIC TABLET AND OTHER DEVICES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1780	$300	$0	$2080	03/20/2014

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

4988 7590 12/20/2013
ALFRED M. WALKER
225 OLD COUNTRY ROAD
MELVILLE, NY 11747-2712

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/526,514	06/18/2012	Peter Allen	120616 Allen TAB Plug CON	7327

TITLE OF INVENTION: LOCKING ASSEMBLY FOR ELECTRONIC TABLET AND OTHER DEVICES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1780	$300	$0	$2080	03/20/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
HAUGHTON, ANTHONY MICHAEL	2846	200-332200

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29
  NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27
  NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status.
  NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/526,514	06/18/2012	Peter Allen	120616 Allen TAB Plug CON	7327

4988 7590 12/20/2013

ALFRED M. WALKER
225 OLD COUNTRY ROAD
MELVILLE, NY 11747-2712

EXAMINER	
HAUGHTON, ANTHONY MICHAEL	
ART UNIT	PAPER NUMBER
2846	

DATE MAILED: 12/20/2013

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notices of Allowance and Fee(s) Due mailed between October 1, 2013 and December 31, 2013

(Addendum to PTOL-85)

If the "Notice of Allowance and Fee(s) Due" has a mailing date on or after October 1, 2013 and before January 1, 2014, the following information is applicable to this application.

If the issue fee is being timely paid on or after January 1, 2014, the amount due is the issue fee and publication fee in effect January 1, 2014. On January 1, 2014, the issue fees set forth in 37 CFR 1.18 decrease significantly and the publication fee set forth in 37 CFR 1.18(d)(1) decreases to $0.

If an issue fee or publication fee has been previously paid in this application, applicant is not entitled to a refund of the difference between the amount paid and the amount in effect on January 1, 2014.

Notice of Allowability	Application No. 13/526,514	Applicant(s) ALLEN, PETER	
	Examiner ANTHONY HAUGHTON	Art Unit 2846	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the amendment filed on 11/22/2013*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-15 and 22 (Renumbered 1-16)*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/ANTHONY HAUGHTON/
Primary Examiner, Art Unit 2846

1. The present application is being examined under the pre-AIA first to invent provisions.

DETAILED ACTION

Allowable Subject Matter

2. **Claims 1-15 and 22 (Renumbered 1-16)** allowed.

3. The following is an examiner's statement of reasons for allowance: **Claims 1-15 and 22 (Renumbered 1-16)** are considered to be allowable because the prior art of record neither anticipates nor renders obvious the limitations of the base claims 1 and 22. **Claim 1** includes a locking assembly for securing a portable electronic device having at least one housing to a substantially immovable object, the locking assembly comprising: a captive security rod having a locking end and an anchoring end, said captive security rod being captive partially in said at least one housing and partially out of said at least one housing during and before locking use: and a locking device with a locking mechanism, wherein the locking device is configured with an opening to receive the locking end of the captive security rod to activate the locking mechanism, where the activation causes the locking mechanism to securely grasp the locking end and thereby lock the security rod and portable electronic device to the locking device in combination with all other elements of the base claim. **Claims 2-15** are all dependent upon claim 1 and are considered to be allowable at least for the same reasons as claim 1. **Claim 22** includes a method for securing a portable electronic device having a housing to a substantially immovable object utilizing a locking assembly, the locking assembly comprising a captive security rod or spike formed with an anchoring end

separated axially by a protruding end, said captive security rod being captive partially in said at least one housing and partially out of said at least one housing during and before locking use; a locking device with a cable permanently attached to the locking device at one end, the method comprising acts of: securedly fixing the anchoring end of the captive security rod or spike to the portable electronic device upon or through the housing; attaching an other end of the cable to the substantially immovable object; and inserting the protruding end of the captive security rod into an opening in the locking device to actuate the internal locking mechanism and lock the locking device to the captive security rod and, therefore, the portable electronic device to which it is anchored, to the substantially immovable object in combination with all other elements of the base claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY HAUGHTON whose telephone number is (571)272-9087. The examiner can normally be reached on 7:30 - 4:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Jinhee J. Lee can be reached on 571-272-1977. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ANTHONY HAUGHTON/
Primary Examiner, Art Unit 2846

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13526514	ALLEN, PETER
	Examiner	Art Unit
	ANTHONY HAUGHTON	2835

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
361	679.57	5/20/2013	AMH
312	221.1, 221.2	5/20/2013	AMH
361	679.57, 679.58	12/10/2013	AMH
312	223.2	12/10/2013	AMH
211	8, 9	12/10/2013	AMH
257	727	12/10/2013	AMH
70	15, 50	12/10/2013	AMH

SEARCH NOTES		
Search Notes	Date	Examiner
east saerch (see search notes)	5/20/2013	AMH
inventor search	5/20/2013	AMH
EAST SEARCH (SEE SEARCH NOTES)	12/10/2013	AMH
INVENTOR SEARCH	12/10/2013	AMH

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	PG-PUB CLAIM TEXT SEARCH	12/10/2013	AMH
361	679.57, 679.58	12/10/2013	AMH
312	223.2	12/10/2013	AMH

	/ANTHONY HAUGHTON/ Primary Examiner.Art Unit 2846

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
211	8, 9	12/10/2013	AMH
257	727	12/10/2013	AMH
70	15, 50	12/10/2013	AMH

	/ANTHONY HAUGHTON/ Primary Examiner.Art Unit 2846

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 7327

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/526,514	06/18/2012	361	2846	120616 Allen TAB Plug CON

APPLICANTS

INVENTORS

Peter Allen, Locust Valley, NY;

**** CONTINUING DATA ***************************

This application is a CON of 13/031,174 02/18/2011 PAT 8223488 *
which is a CIP of 12/657,670 01/25/2010 PAT 8139356 *
which is a CIP of 12/154,561 05/23/2008 PAT 7724520 *
which is a CIP of 11/454,433 06/15/2006 PAT 7443665 *
which is a CIP of 11/359,871 02/22/2006 PAT 7324333 *
which claims benefit of 60/655,270 02/22/2005
and claims benefit of 60/678,911 05/06/2005
and said 11/454,433 06/15/2006
claims benefit of 60/691,476 06/17/2005
and claims benefit of 60/725,333 10/11/2005
and claims benefit of 60/757,737 01/10/2006
and claims benefit of 60/783,188 03/16/2006
(*)Data provided by applicant is not consistent with PTO records.

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

06/27/2012

Foreign Priority claimed ☐ Yes ☑ No		STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
35 USC 119(a-d) conditions met ☐ Yes ☑ No	☐ Met after Allowance				
Verified and Acknowledged /ANTHONY MICHAEL HAUGHTON/ Examiner's Signature	/AMH/ Initials	NY	41	22	3

ADDRESS

ALFRED M. WALKER
225 OLD COUNTRY ROAD
MELVILLE, NY 11747-2712
UNITED STATES

TITLE

LOCKING ASSEMBLY FOR ELECTRONIC TABLET AND OTHER DEVICES

FILING FEE RECEIVED		
1370	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

BIB (Rev. 05/07).

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	258	((PETER) near2 (ALLEN)).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/12/10 23:15
S1	1	"6182481".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:17
S2	1	"6178089".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:18
S3	1	"5502989".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:18
S4	1	"5493878".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:18
S5	1	"5787735".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:18
S6	1	"5082232".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:18
S7	6	S1 S2 S3 S4 S5 S6	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:18
S8	29	("0153673" | "1707225" | "4313319" | "4359646" | "4924683" | "5351508" | "5406809" | "5447045" | "5450271" | "5526226" | "5594419" | "5595074" | "5709110" | "5757616" | "5787738" | "5819561" | "5870281" | "5960651" | "5987937" | "6000252").PN. OR ("6182481").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:18
S9	28	("4252007" | "4453692" | "4585202" | "4613109" | "4656848" | "4729614" | "4733840" | "4946127" | "5154456" | "5228319" | "5288049" | "5361610" | "5381685" | "5398530" | "5493878" | "5502989" | "5519572" | "5604663" | "5631449" | "5668882" | "5682290" | "5697233" | "5701347" | "5987937").PN. OR ("6178089").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:22

S10	8	(US-6182481-$ or US-6178089-$ or US-5502989-$ or US-5493878-$ or US-5082232-$ or US-6788216-$ or US-5787738-$ or US-5709110-$).did.	USPAT	OR	OFF	2008/06/06 13:43
S11	4	S10 and (laptop or (lap adj top) or notebook)	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:44
S12	1	"6257542".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:45
S13	1	"5595074".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:58
S14	1	"5493878".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:58
S15	2	S13 S14	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 13:58
S16	1	"3945227".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 14:49
S17	1	"5787738".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 14:49
S18	2	S16 S17	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 14:49
S19	1	"20050247584"	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 14:52
S20	1	"6926141".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/06 14:53
S21	3940	361/683.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 08:46
S22	865	257/727.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 08:46
S23	1258	312/223.2.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 08:46
S24	536	211/8,9.ccls.	US-PGPUB; USPAT;	OR	OFF	2008/06/09 08:46

			USOCR			
S25	2637	312/223.3,351.3-351.9,215-221,208.3,208.3.CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 08:55
S27	4345	361/679-681.CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 08:55
S28	122621	LOCK.CLM.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:00
S29	6588	(laptop or (lap adj top) or (notebook adj computer)).clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:01
S30	569324	base.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:01
S31	72025	clamp.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:01
S32	197948	pin.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:01
S33	270089	hole.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:01
S34	7336	ferrule.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:01
S35	6933	chord.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:02
S36	111841	cable.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:02
S37	22498	knob.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:02
S38	120510	screw.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:02
S39	32877	tighten$3.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:02
S40	185607	recess.clm.	US-	OR	OFF	2008/06/09

			PGPUB; USPAT; USOCR			09:02
S41	72439	hinge.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2008/06/09 09:02
S42	15350	S30 S31	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S43	2355	S32 S42	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S44	7	S29 S43	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S45	320	S29 S41	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S46	38	S45 S36	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S47	4941	S36 S31	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S48	118602	S35 or S36	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S49	1099	S48 S37	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:03
S50	167	S49 S38	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:04
S51	2924	S37 S38	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:04
S52	484	S51 S40	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:04
S53	1	S45 S35	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:04
S54	310	S51 S39	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:04

S55	52	S52 S54	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:04
S56	9080	S32 S31	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S57	2	S56 S45	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S58	963	S51 S33	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S59	197	S58 S40	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S60	119	S58 S39	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S61	35	S58 S36	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S62	0	S58 S35	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S63	118602	S35 or S36	US-PGPUB; USPAT; USOCR	AND	OFF	2008/06/09 09:05
S64	171152	base.clm.	US-PGPUB	OR	OFF	2008/06/09 09:06
S65	16418	clamp.clm.	US-PGPUB	OR	OFF	2008/06/09 09:06
S66	47184	pin.clm.	US-PGPUB	OR	OFF	2008/06/09 09:07
S67	2104	ferrule.clm.	US-PGPUB	OR	OFF	2008/06/09 09:07
S68	90891	hole.clm.	US-PGPUB	OR	OFF	2008/06/09 09:07
S69	35210	(chord or cable).clm.	US-PGPUB	OR	OFF	2008/06/09 09:07
S70	5767	knob.clm.	US-PGPUB	OR	OFF	2008/06/09 09:07
S71	31456	screw.clm.	US-PGPUB	OR	OFF	2008/06/09 09:07
S72	7874	tighten$3.clm.	US-PGPUB	OR	OFF	2008/06/09 09:07
S73	46415	recess.clm.	US-PGPUB	OR	OFF	2008/06/09 09:08
S74	19963	hinge.clm.	US-	OR	OFF	2008/06/09

			PGPUB			09:08
S75	4477	(laptop or (lap adj top) or (notebook adj computer)).clm.	US-PGPUB	OR	OFF	2008/06/09 09:08
S76	70	S75 S74 S64	US-PGPUB	AND	OFF	2008/06/09 09:08
S77	160	S74 S75	US-PGPUB	AND	OFF	2008/06/09 09:09
S78	698	S70 S73	US-PGPUB	AND	OFF	2008/06/09 09:09
S79	238	S68 S78	US-PGPUB	AND	OFF	2008/06/09 09:09
S80	1	S77 S79	US-PGPUB	AND	OFF	2008/06/09 09:09
S81	7	S65 S77	US-PGPUB	AND	OFF	2008/06/09 09:09
S82	2056	S65 S66	US-PGPUB	AND	OFF	2008/06/09 09:09
S83	84	S65 S67	US-PGPUB	AND	OFF	2008/06/09 09:09
S84	15	S82 S83	US-PGPUB	AND	OFF	2008/06/09 09:09
S85	1	S77 S84	US-PGPUB	AND	OFF	2008/06/09 09:09
S86	1960	S65 S71	US-PGPUB	AND	OFF	2008/06/09 09:10
S87	2	S77 S86	US-PGPUB	AND	OFF	2008/06/09 09:10
S88	1119	S69 S65	US-PGPUB	AND	OFF	2008/06/09 09:10
S89	2	S88 S77	US-PGPUB	AND	OFF	2008/06/09 09:10
S90	1863	S71 S72	US-PGPUB	AND	OFF	2008/06/09 09:11
S91	317	S65 S90	US-PGPUB	AND	OFF	2008/06/09 09:11
S92	86	S70 S90	US-PGPUB	AND	OFF	2008/06/09 09:11
S93	317	S71 S91	US-PGPUB	AND	OFF	2008/06/09 09:11
S94	86	S71 S92	US-PGPUB	AND	OFF	2008/06/09 09:11
S95	2	S93 S77	US-PGPUB	AND	OFF	2008/06/09 09:11
S96	0	S94 S77	US-PGPUB	AND	OFF	2008/06/09 09:11
S97	137	("4009599" | "3965705" | "5052198" | "5351507" | "5502989" | "5568359" | "RE28187" | "20070205125" | "6308928" | "6443417" | "6497125" | "6926141" | "D425402" | "D553352" | "D565839" | "3181319" | "3410580" | "3945227" | "4696449" | "5052199" | "5085395" | "5469726" | "5582044" | "5595074" | "5709110" | "6178089" | "6212921" | "6216499" | "20040007651" |	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 11:59

		"20050247584" | "2575542" | "6581420" | "6820362" | "7107093" | "7255228" | "D436310" | "D499546" | "6182481" | "6317936" | "6578394" | "6590767" | "6612455" | "6708966" | "6755056" | "6788216" | "D491009" | "D559076" | "4856304" | "7963132" | "20010049949" | "20060176661" | "5794463" | "5927108" | "20050150263" | "6275378" | "6427499" | "6763690" | "7007912" | "7499269" | "20050178173" | "5608605" | "20050178173" | "6920770" | "7409842" | "7647796" | "3410122" | "4870842" | "5381685" | "5493878" | "5816076" | "5836183" | "6138483" | "6155088" | "6185964" | "6697252" | "7499270" | "D415950" | "D485060" | "D503532" | "5351508" | "5406809" | "5076079" | "5135197" | "5265449" | "5542723" | "5645261" | "5787739" | "6796536" | "3154432" | "20080110217" | "4738428" | "4821538" | "3275160" | "4066231" | "4733840" | "5169114" | "5531082" | "5560481" | "5762306" | "5787738" | "6000252" | "20030085125" | "20040161557" | "20060032877" | "6237375" | "6331934" | "6684548" | "6705133" | "6735990" | "6810698" | "7443665" | "D519731" | "20060117814" | "3535898" | "4418553" | "4426863" | "6006557" | "20070235493" | "6477871" | "6560710" | "6689954" | "6711921" | "8659144" | "6913238" | "D405348" | "D521232" | "D533994" | "5082232" | "3707860" | "5345219" | "5361610").PN.				
S98	1	"7443665".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 14:10
S99	1	"7324333".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 14:11
S100	8	("5327752" | "6112562" | "7101203" | "5240218" | "5915690" | "5381685" | "5502989" | "6975224").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 14:41
S101	67	("4027798" | "4308733" | "4365280" | "4640106" | "4685312" | "4733840" | "4738428" | "4794587" | "4856304" | "4918952" | "4924683" | "4964285" | "5117661" | "5136862").PN. OR ("5361610").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 15:32
S102	67	("4027798" | "4308733" | "4365280" | "4640106" | "4685312" | "4733840" | "4738428" | "4794587" | "4856304" | "4918952" | "4924683" | "4964285" | "5117661" | "5136862").PN. OR ("5361610").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 15:36
S103	41	("4616490" | "4655057").PN. OR ("5608605").URPN.	US-PGPUB; USPAT;	OR	OFF	2012/05/17 15:36

			USOCR			
S104	14	("20080220812" | "20090001116" | "5351508" | "5361610" | "5446618" | "5447044" | "5447045" | "5526226" | "5787738" | "5960651" | "6178089" | "6244082" | "6389854" | "6788216").PN. OR ("8111511").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 15:37
S105	22	("20040112098" | "20060243006" | "20060266086" | "20100142135" | "20100206018" | "20100320884" | "3599453" | "3707860" | "3965705" | "4353521" | "4843848" | "5288049" | "5361610" | "5547236" | "5608605" | "5787738" | "5944550" | "5987937" | "6006557" | "6094949" | "6742366" | "7431322").PN. OR ("8107236").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 15:44
S106	40	("5154456" | "5264986" | "5446618").PN. OR ("5526226").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 15:45
S107	42	("4777812" | "4941841" | "5051868" | "5154456" | "5228319").PN. OR ("5446618").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/17 15:47
S108	554559	display.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/18 07:40
S109	267	haughton.xa.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/18 07:40
S110	93	S109 and display.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/18 07:40
S111	1	S110 and seal$3.clm.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/18 07:40
S112	141	S109 and display	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/18 07:47
S113	19	S112 and seal$3	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/18 07:47
S114	267	haughton.xa.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/29 18:25
S115	4	S114 and flexible near display	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/29 18:25
S116	4	S114 and (flexible near display)	US-PGPUB; USPAT;	OR	OFF	2012/05/29 18:25

			USOCR			
S117	321	257/731.CCLS.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/06/19 09:36
S118	2	"20100009247"	US-PGPUB; USPAT; USOCR	OR	OFF	2012/06/19 11:27
S119	143	("3965705" | "5052198" | "5351507" | "5502989" | "5568359" | "RE28187" | "D425402" | "D553352" | "D565839" | "20070205125" | "6308928" | "6443417" | "6497125" | "6926141" | "3181319" | "3410580" | "3945227" | "4696449" | "5052199" | "5085395" | "5469726" | "5582044" | "5595074" | "5709110" | "6178089" | "6212921" | "6216499" | "8111511" | "D436310" | "D499546" | "20040007651" | "20050247584" | "2575542" | "6581420" | "6820362" | "7107093" | "7255228" | "6182481" | "4856304" | "7963132" | "5154456" | "7409842" | "D491009" | "D559076" | "6317936" | "6578394" | "6590767" | "6612455" | "6708966" | "6755056" | "6788216" | "5926092" | "5794463" | "5927108" | "20050178173" | "5608605" | "20010049949" | "20050150263" | "20060117814" | "6920770" | "7647796" | "6275378" | "6427499" | "6763690" | "7007912" | "7499269" | "3410122" | "4870842" | "5381685" | "5493878" | "5816076" | "5836183" | "6138483" | "6155088" | "6185964" | "5351508" | "5406809" | "D415950" | "D485060" | "D503532" | "6697252" | "7499270" | "5076079" | "5135197" | "5265449" | "5542723" | "5645261" | "5787739" | "4738428" | "4821538" | "4009599" | "6796536" | "3154432" | "6788216" | "3275160" | "4066231" | "4733840" | "5169114" | "5531082" | "5560481" | "5762306" | "5787738" | "6000252" | "20060176661" | "5446618" | "6735990" | "D519731" | "20030085125" | "20040161557" | "20060032877" | "6237375" | "6331934" | "6684548" | "6705133" | "6810698" | "7443665" | "5760690" | "3535898" | "4418553" | "4426863" | "6006557" | "3707860" | "5345219" | "5361610" | "20080110217" | "5082232" | "5526226" | "D405348" | "D521232" | "D533994" | "20070235493" | "6477871" | "6560710" | "6689954" | "6711921" | "8659144" | "6913238").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 09:57
S120	25	(US-20060117814-$ or US-20050150263-$ or US-20010049949-$ or US-20080110217-$ or US-20100320884-$).did. or (US-6182481-$ or US-6178089-$ or US-5502989-$ or US-5493878-$ or US-5082232-$ or US-6788216-$ or US-5787738-$ or US-5709110-$ or US-	US-PGPUB; USPAT	OR	OFF	2013/05/20 09:59

		6257542-$ or US-6755056-$ or US-6735990-$ or US-6578394-$ or US-5608605-$ or US-5361610-$ or US-8111511-$ or US-8107236-$ or US-5526226-$ or US-5446618-$ or US-5675998-$ or US-5154456-$).did.				
S121	21	S119 and S120	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 09:59
S122	20	S120 and @ad<"20050506"	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:07
S123	10606	"25" and (pin near lock)	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:22
S124	0	S120 and (pin near lock)	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:22
S125	2	S120 and (plunger)	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:22
S126	13	S120 and (pin)	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:22
S127	267	haughton.xa.	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:46
S128	128	haughton.xp.	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:46
S129	395	S127 S128	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:46
S130	1	S129 and ((HDD or (disk near drive) or (disc near drive)) with adapter)	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:47
S131	72	S129 and ((HDD or (disk near drive) or (disc near drive)))	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:47
S132	9	S131 and adapter	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:47
S133	40	S131 and connector	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:48
S134	31	S131 and ((mother or main or circuit) near board)	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:48
S135	14	S131 and ((mother or main) near board)	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:49
S136	17	S134 not S135	US-PGPUB; USPAT	OR	OFF	2013/05/20 10:50
S137	0	312/221.1.ccls.	US-PGPUB; USPAT;	OR	OFF	2013/05/20 12:45

			USOCR			
S138	0	312/221.2.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 12:45
S139	430	361/679.57.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 12:46
S140	1	"5502989".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 12:52
S141	26	(US-20060117814-$ or US-20050150263-$ or US-20010049949-$ or US-20080110217-$ or US-20100320884-$).did. or (US-6182481-$ or US-6178089-$ or US-5502989-$ or US-5493878-$ or US-5082232-$ or US-6788216-$ or US-5787738-$ or US-5709110-$ or US-6257542-$ or US-6755056-$ or US-6735990-$ or US-6578394-$ or US-5608605-$ or US-5361610-$ or US-8111511-$ or US-8107236-$ or US-5526226-$ or US-5446618-$ or US-5675998-$ or US-5154456-$ or US-7355845-$).did.	US-PGPUB; USPAT	OR	OFF	2013/05/20 13:13
S142	0	S141 and ((pin near lock) or pinlock)	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 13:13
S143	2	S141 and ((pin near5 lock) or pinlock)	US-PGPUB; USPAT; USOCR	OR	OFF	2013/05/20 13:13
S144	1	"20120032821"	US-PGPUB; USPAT	OR	OFF	2013/05/30 17:35
S145	1	"5446618".pn.	US-PGPUB; USPAT	OR	OFF	2013/05/30 17:35
S146	1	"20070201194"	US-PGPUB; USPAT	OR	OFF	2013/05/30 17:35
S147	3	S144 S145 S146	US-PGPUB; USPAT	OR	OFF	2013/05/30 17:37
S148	0	("2012/0032821").URPN.	USPAT	OR	OFF	2013/05/31 08:18
S149	0	"20080035808"	USPAT	OR	OFF	2013/06/01 08:12
S150	1	"20080237424"	USPAT	OR	OFF	2013/06/01 08:12
S151	0	"20090095854"	USPAT	OR	OFF	2013/06/01 08:12
S152	1	"20090095854"	US-PGPUB; USPAT;	OR	OFF	2013/06/01 08:12

			USOCR			
S153	2	"20080237424"	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/01 08:12
S154	1	"20080035808"	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/01 08:12
S155	4	S152 S153 S154	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/01 08:12
S156	1	"5370178".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/01 09:41
S157	1	"5615084".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/01 09:41
S158	1	"7324341".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/01 09:41
S159	1	"7347251".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/01 09:41
S160	4	S156 S157 S158 S159	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/01 09:41
S161	1	"5651622".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 08:55
S162	2	"20040052044"	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 08:55
S163	1	"6842338".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 08:55
S164	1	"20050002158"	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 08:55
S165	1	"6944012".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 08:55
S166	6	S161 S162 S163 S164 S165	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 08:55
S167	2	"20090146024"	US-	OR	OFF	2013/06/03

			PGPUB; USPAT; USOCR			09:11
S168	1	"7636133".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 09:12
S169	2	"20100014229"	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 09:12
S170	2	"20100008032"	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 09:12
S171	2	"20100050383"	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 09:12
S172	1	"7735797".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 09:12
S173	10	S167 S168 S169 S170 S171 S172	US-PGPUB; USPAT; USOCR	OR	OFF	2013/06/03 09:12
S174	1	"8508928".pn.	US-PGPUB; USPAT	OR	OFF	2013/12/10 12:55
S175	1	"6633081".pn.	US-PGPUB; USPAT	OR	OFF	2013/12/10 13:08
S176	2	"20100259882"	US-PGPUB; USPAT	OR	OFF	2013/12/10 13:10
S177	1	"6133637".pn.	US-PGPUB; USPAT	OR	OFF	2013/12/10 13:10
S178	1	"7605476".pn.	US-PGPUB; USPAT	OR	OFF	2013/12/10 13:11
S179	1	"7203063".pn.	US-PGPUB; USPAT	OR	OFF	2013/12/10 13:24
S180	1	"7719834".pn.	US-PGPUB; USPAT	OR	OFF	2013/12/10 13:25
S181	1	"20100040053".pn.	US-PGPUB; USPAT	OR	OFF	2013/12/10 13:25
S182	1	"5971804".pn.	US-PGPUB; USPAT	OR	OFF	2013/12/10 13:26
S183	3	("6501662" | "20040240184" | "20100097765").pn.	US-PGPUB; USPAT	OR	OFF	2013/12/10 13:31
S184	3	("8081449" | "20040240184" |	US-	OR	OFF	2013/12/10

		"20100097765").pn.	PGPUB; USPAT			13:40
S185	4	("8081449" | "8490248" | "7877122" | "20090104942").pn.	US-PGPUB; USPAT	OR	OFF	2013/12/10 13:40
S186	2	("20080266781" | "5971780").pn.	US-PGPUB; USPAT	OR	OFF	2013/12/10 13:52
S187	5	("20090175458" | "20080165066" | "7889139" | "6908324" | "5901367").pn.	US-PGPUB; USPAT	OR	OFF	2013/12/10 14:21
S188	258	((PETER) near2 (ALLEN)).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2013/12/10 14:33

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	3807	(locking near assembly).clm.	USPAT; UPAD	OR	OFF	2013/12/10 23:16
L3	4756	(portable near electronic).clm.	USPAT; UPAD	OR	OFF	2013/12/10 23:16
L4	21	(security near rod).clm.	USPAT; UPAD	OR	OFF	2013/12/10 23:16
L5	3517	captive.clm.	USPAT; UPAD	OR	OFF	2013/12/10 23:16
L6	6357	(locking near end).clm.	USPAT; UPAD	OR	OFF	2013/12/10 23:16
L7	1219	(anchoring near end).clm.	USPAT; UPAD	OR	OFF	2013/12/10 23:17
L8	16	(partially near in).clm.	USPAT; UPAD	OR	OFF	2013/12/10 23:17
L9	1144	(partially near out).clm.	USPAT; UPAD	OR	OFF	2013/12/10 23:17
L10	0	(locking near use).clm.	USPAT; UPAD	OR	OFF	2013/12/10 23:17
L11	10852	(locking near device).clm.	USPAT; UPAD	OR	OFF	2013/12/10 23:17
L12	15605	(locking near mechanism).clm.	USPAT; UPAD	OR	OFF	2013/12/10 23:17
L13	639718	opening.clm.	USPAT; UPAD	OR	OFF	2013/12/10 23:17
L14	7442	grasp.clm.	USPAT; UPAD	OR	OFF	2013/12/10 23:17
L15	39636	securely.clm.	USPAT; UPAD	OR	OFF	2013/12/10 23:18
L16	8	2 3	USPAT; UPAD	AND	OFF	2013/12/10 23:19
L17	1	4 16	USPAT; UPAD	AND	OFF	2013/12/10 23:19
L18	1	4 5	USPAT; UPAD	AND	OFF	2013/12/10 23:19
L19	1	16 18	USPAT;	AND	OFF	2013/12/10

			UPAD			23:19
L20	0	2 3 4 5 6 7 8 9	USPAT; UPAD	AND	OFF	2013/12/10 23:30
L21	1	16 6	USPAT; UPAD	AND	OFF	2013/12/10 23:30
L22	1	16 7	USPAT; UPAD	AND	OFF	2013/12/10 23:30
L23	0	16 8	USPAT; UPAD	AND	OFF	2013/12/10 23:30
L24	0	16 9	USPAT; UPAD	AND	OFF	2013/12/10 23:30
L25	1	4 5 6 7	USPAT; UPAD	AND	OFF	2013/12/10 23:30
L26	1	2 3 4 5 6 7	USPAT; UPAD	AND	OFF	2013/12/10 23:30
L27	787	11 12	USPAT; UPAD	AND	OFF	2013/12/10 23:30
L28	1	26 27	USPAT; UPAD	AND	OFF	2013/12/10 23:30
L29	1	16 27	USPAT; UPAD	AND	OFF	2013/12/10 23:30
L30	157	13 14 15	USPAT; UPAD	AND	OFF	2013/12/10 23:30
L31	0	30 27	USPAT; UPAD	AND	OFF	2013/12/10 23:30
L32	0	30 16	USPAT; UPAD	AND	OFF	2013/12/10 23:31
L33	317	361/679.57.ccls.	USPAT; UPAD	AND	OFF	2013/12/10 23:31
L34	1132	361/679.58.ccls.	USPAT; UPAD	AND	OFF	2013/12/10 23:31
L35	1686	312/223.2.ccls.	USPAT; UPAD	AND	OFF	2013/12/10 23:32
L36	221	211/8.ccls.	USPAT; UPAD	AND	OFF	2013/12/10 23:32
L37	98	211/9.ccls.	USPAT; UPAD	AND	OFF	2013/12/10 23:32
L38	813	257/727.ccls.	USPAT; UPAD	AND	OFF	2013/12/10 23:32
L39	127	70/15.ccls.	USPAT; UPAD	AND	OFF	2013/12/10 23:32
L40	112	70/50.ccls.	USPAT; UPAD	AND	OFF	2013/12/10 23:32

12/10/2013 11:32:56 PM
C:\Users\ahaughton\Documents\EAST\Workspaces\13_\13_526514\Search 5_20.wsp

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13526514	ALLEN, PETER
	Examiner	**Art Unit**
	ANTHONY HAUGHTON	2846

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	05/20/2013	12/10/2013							
1	1	✓	=							
2	2	✓	=							
3	3	✓	=							
4	4	✓	=							
5	5	✓	=							
6	6	✓	=							
7	7	✓	=							
8	8	✓	=							
9	9	✓	=							
10	10	✓	=							
11	11	✓	=							
12	12	✓	=							
13	13	✓	=							
14	14	✓	=							
15	15	✓	=							
-	16	✓	-							
-	17	✓	-							
-	18	✓	-							
-	19	✓	-							
-	20	✓	-							
-	21	✓	-							
16	22	✓	=							

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13526514	ALLEN, PETER
	Examiner	**Art Unit**
	ANTHONY HAUGHTON	2846

CPC		
Symbol	**Type**	**Version**

CPC Combination Sets				
Symbol	**Type**	**Set**	**Ranking**	**Version**

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	16	
/ANTHONY HAUGHTON/ Primary Examiner.Art Unit 2846	12/10/2013	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	30 and 31

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13526514	ALLEN, PETER
	Examiner	**Art Unit**
	ANTHONY HAUGHTON	2846

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
361	679.57

CROSS REFERENCE(S)

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
361	679.58				
312	223.2				
211	8	9			
257	727				
70	15	50			

INTERNATIONAL CLASSIFICATION														
CLAIMED					**NON-CLAIMED**									
H	0	5	K	5 / 00 (2006.01.01)										
H	0	5	K	7 / 00 (2006.01.01)										
E	0	5	B	69 / 00 (2006.01.01)										
E	0	5	B	73 / 00 (2006.01.01)										
H	0	1	L	23 / 34 (2006.01.01)										
A	4	7	B	81 / 00 (2006.01.01)										
A	4	7	B	97 / 00 (2006.01.01)										

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	16	
/ANTHONY HAUGHTON/ Primary Examiner.Art Unit 2846	12/10/2013	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	30 and 31

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13526514	ALLEN, PETER
	Examiner	**Art Unit**
	ANTHONY HAUGHTON	2846

☒ **Claims renumbered in the same order as presented by applicant** ☐ **CPA** ☐ **T.D.** ☐ **R.1.47**

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	-	17												
2	2	-	18												
3	3	-	19												
4	4	-	20												
5	5	-	21												
6	6	16	22												
7	7														
8	8														
9	9														
10	10														
11	11														
12	12														
13	13														
14	14														
15	15														
-	16														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 16	
/ANTHONY HAUGHTON/ Primary Examiner.Art Unit 2846 (Primary Examiner)	12/10/2013 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 30 and 31

FAW

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

4988 7590 12/20/2013
ALFRED M. WALKER
225 OLD COUNTRY ROAD
MELVILLE, NY 11747-2712



Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Alfred M. Walker	(Depositor's name)
	(Signature)
March 17, 2014	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/526,514	06/18/2012	Peter Allen	120616 Allen TAB Plug CON	7327

TITLE OF INVENTION: LOCKING ASSEMBLY FOR ELECTRONIC TABLET AND OTHER DEVICES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	~~$1750~~ $960	$300	$0	~~$2060~~ $960	03/20/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
HAUGHTON, ANTHONY MICHAEL	2846	200-332200

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Alfred M. Walker
2 John F. Vodopia
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Think Products, Inc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Hauppauge, NY

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☐ Publication Fee (No small entity discount permitted) N/A
☒ Advance Order - # of Copies 10

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)
☐ A check is enclosed.
☒ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 23-0120 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)
☐ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
☐ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
☐ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature: Alfred M. Walker
Typed or printed name: Alfred M. Walker
Date: 03/17/2014
Registration No. 29,983

01 FC:1501 960.00 OP
02 FC:8001 ~~38.00~~ OP

PAGE 1/2 * RCVD AT 3/17/2014 4:41:44 PM [Eastern Daylight Time] * SVR:W-PTOFAX-002/39 * DNIS:2732885 * CSID:631 361 8792 * DURATION (mm-ss):12-59
OF COMMERCE
Ex. 1002 - Page 978 of 997

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/526,514	06/18/2012	Peter Allen	120616 Allen TAB Plug CON	7327

4988 7590 03/22/2014

ALFRED M. WALKER
225 OLD COUNTRY ROAD
MELVILLE, NY 11747-2712

EXAMINER	
HAUGHTON, ANTHONY MICHAEL	
ART UNIT	PAPER NUMBER
2846	
MAIL DATE	DELIVERY MODE
03/22/2014	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Application No. : 13526514
Applicant : Allen
Filing Date : 06/18/2012
Date Mailed : 03/22/2014

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Notice of Allowance Mailed

This application has been accorded an Allowance Date and is being prepared for issuance. The application, however, is incomplete for the reasons below.

Applicant is given two (2) months from the mail date of this Notice within which to respond. This time period for reply is extendable under 37 CFR 1.136(a) for only TWO additional MONTHS.

The informalities requiring correction are indicated in the attachment(s). If the informality pertains to the abstract, specification (including claims) or drawings, the informality must be corrected with an amendment in compliance with 37 CFR 1.121 (or, if the application is a reissue application, 37 CFR 1.173). Such an amendment may be filed after payment of the issue fee if limited to correction of informalities noted herein. See Waiver of 37 CFR 1.312 for Documents Required by the Office of Patent Publication, 1280 Off. Gaz. Patent Office 918 (March 23, 2004). In addition, if the informality is not corrected until after payment of the issue fee, for purposes of 35 U.S.C. 154(b)(1)(iv), "all outstanding requirements" will be considered to have been satisfied when the informality has been corrected. A failure to respond within the above-identified time period will result in the application being ABANDONED.

See attachment(s).

A copy of this notice MUST be returned with the reply. Please address response to "Mail Stop Issue Fee, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450".

/Jonathan Robbins/
Publication Branch
Office of Data Management
(571) 272-4200

Application No. 13526514

SPECIFICATION REFERS TO ITS OWN PAGE/PARAGRAPH NUMBER(S) AND/OR SPECIFICATION REFERS TO NONEXISTENT CLAIM(S)

☐ The patent will be printed in numbered columns with intercolumnar line numbers and without paragraph numbers. Any reference(s) within the applicant-filed specification to its own page number(s) or paragraph number(s) will have no meaning in the printed patent.

In response to this notice, the applicant either should file an amendment to the specification that removes the reference(s) to the page number(s) or paragraph number(s) or should submit a letter stating that the patent specification should be printed with the reference(s) to the page number(s) or paragraph number(s).

See Page(s)/Paragraph(s) .

☒ The specification refers by number to one or more claims that are not present in the allowed application – that is, the claim number(s) mentioned in the specification are higher than the total number of allowed claims.

In response to this notice, the applicant either should file an amendment to the specification that removes the reference(s) to the nonexistent claim(s) or should submit a letter stating that the patent specification should be printed with the reference(s) to the nonexistent claim(s).

See Page(s)/Paragraph(s) Page 27, line 16.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	Peter Allen
TITLE:	LOCKING ASSEMBLY FOR ELECTRONIC TABLET AND OTHER DEVICES
SERIAL NO.:	13/526,514
FILED:	06/18/2012
GROUP ART UNIT:	3673
EXAMINER:	7327
NOTICE OF ALLOWANCE:	December 20, 2013
ATTORNEY DOCKET NUMBER:	120616 Allen TAB PlUG CON

AMENDMENT TO CORRECT INFORMALITIES IN APPLICATION PAPERS

Hon. Commissioner of Patents and Trademarks
Mail Stop ISSUE FEE
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Prior to an examination on the merits of the above entitled application, please amend the application as follows:

IN THE SPECIFICATION:

On page 27, line 16, please amend the Specification as follows in the paragraph extending from line 8 to line 17 as follows:

-- Please note that features of the above described locking assembly for securing a portable electronic device having at least one housing to a substantially immovable object, the locking assembly for securing a portable electronic device having a housing to a substantially immovable object and the method for securing a portable electronic device having a housing to a substantially immovable object utilizing a locking assembly are supported by the written description and drawing figures as filed. For example, the captive security rod and locking device find support in rod 291 and pin lock 100 of Figs 29 and 30, and the security rod or spike and cable with first end formed with a ferrule having a locking groove of ~~claim~~ Fig. 21 finds support in spike 285 and cable 210 of Fig. 29, and text describing same. --

PAGE 3/7 * RCVD AT 3/28/2014 3:58:45 PM [Eastern Daylight Time] * SVR:W-PTOFAX-001/6 * DNIS:2732885 * CSID:631 361 8792 * DURATION (mm-ss):01-16

REMARKS

Applicant submits the within Amendment, in response to the Notice to File Corrected Application Papers dated March 22, 2014.

This Amendment corrects an inadvertent error on page 27, line 16, to delete "claim" with respect to "21" and replace "claim" with Fig." before "21".

The objected to sentence now reads as follows:

For example, the captive security rod and locking device find support in rod 291 and pin lock 100 of Figs 29 and 30, and the security rod or spike and cable with first end formed with a ferrule having a locking groove of Fig. 21 finds support in spike 285 and cable 210 of Fig. 29, and text describing same.

No new matter is introduced to the specification by the foregoing amendment.

A Notice of Allowance was mailed on December 20, 2013 and the Issue Fee was paid on March 17, 2014.

Entry of this Amendment is earnestly solicited.

Respectfully submitted,

Dated: March 28, 2014

Alfred M. Walker
Reg. No. 29,983
Attorney for Applicant
225 Old Country Road
Melville, NY 11747-2712
631-361-8737

CERTIFICATE OF FACSIMILE

I hereby certify that this correspondence is being transmitted by facsimile to (571) 273-2885 to the Commissioner for Patents, Mail Stop: Missing Parts, P.O. Box 1450, Alexandria, VA 22313-1450 on the date indicated below.

Date: March 28, 2014

Alfred M. Walker

PAGE 4/7 * RCVD AT 3/28/2014 3:58:45 PM [Eastern Daylight Time] * SVR:W-PTOFAX-001/6 * DNIS:2732885 * CSID:631 361 8792 * DURATION (mm-ss):01-16
Ex. 1002 - Page 984 of 997

UNITED STATES PATENT AND TRADEMARK OFFICE

OPAP MAR 2 8 2014 PATENT & TRADEMARK OFFICE

5/22

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

COPY

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/526,514	06/18/2012	Peter Allen	120616 Allen TAB Plug CON	7327

4938 7590 03/22/2014

ALFRED M. WALKER
225 OLD COUNTRY ROAD
MELVILLE, NY 11747-2712

EXAMINER	
HAUGHTON, ANTHONY MICHAEL	
ART UNIT	PAPER NUMBER
2846	
MAIL DATE	DELIVERY MODE
03/22/2014	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

OPAP AKUMA-2
MAR 2 8 2014
PATENT & TRADEMARK OFFICE

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Application No. : 13526514
Applicant : Allen
Filing Date : 06/18/2012
Date Mailed : 03/22/2014

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Notice of Allowance Mailed

This application has been accorded an Allowance Date and is being prepared for issuance. The application, however, is incomplete for the reasons below.

Applicant is given two (2) months from the mail date of this Notice within which to respond. This time period for reply is extendable under 37 CFR 1.136(a) for only TWO additional MONTHS.

The informalities requiring correction are indicated in the attachment(s). If the informality pertains to the abstract, specification (including claims) or drawings, the informality must be corrected with an amendment in compliance with 37 CFR 1.121 (or, if the application is a reissue application, 37 CFR 1.173). Such an amendment may be filed after payment of the issue fee if limited to correction of informalities noted herein. See Waiver of 37 CFR 1.312 for Documents Required by the Office of Patent Publication, 1280 Off. Gaz. Patent Office 918 (March 23, 2004). In addition, if the informality is not corrected until after payment of the issue fee, for purposes of 35 U.S.C. 154(b)(1)(iv), "all outstanding requirements" will be considered to have been satisfied when the informality has been corrected. A failure to respond within the above-identified time period will result in the application being ABANDONED.

See attachment(s).

A copy of this notice MUST be returned with the reply. Please address response to "Mail Stop Issue Fee, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450".

/Jonathan Robbins/
Publication Branch
Office of Data Management
(571) 272-4200

Application No. 13526514

SPECIFICATION REFERS TO ITS OWN PAGE/PARAGRAPH NUMBER(S) AND/OR SPECIFICATION REFERS TO NONEXISTENT CLAIM(S)

☐ The patent will be printed in numbered columns with intercolumnar line numbers and without paragraph numbers. Any reference(s) within the applicant-filed specification to its own page number(s) or paragraph number(s) will have no meaning in the printed patent.

In response to this notice, the applicant either should file an amendment to the specification that removes the reference(s) to the page number(s) or paragraph number(s) or should submit a letter stating that the patent specification should be printed with the reference(s) to the page number(s) or paragraph number(s).

See Page(s)/Paragraph(s) .

☒ The specification refers by number to one or more claims that are not present in the allowed application – that is, the claim number(s) mentioned in the specification are higher than the total number of allowed claims.

In response to this notice, the applicant either should file an amendment to the specification that removes the reference(s) to the nonexistent claim(s) or should submit a letter stating that the patent specification should be printed with the reference(s) to the nonexistent claim(s).

See Page(s)/Paragraph(s) Page 27, line 16.

OPAP AKNMR-22 MAR 2 8 2014 PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT:	Peter Allen
SERIAL NO.:	13/526,514
FILED:	06/18/2012
TITLE:	LOCKING ASSEMBLY FOR ELECTRONIC TABLET AND OTHER DEVICES
GROUP ART UNIT:	3673
CONFIRMATION NO.:	7327
NOTICE OF ALLOWANCE:	December 20, 2013
ATTY DOCKET NO.:	120616 Allen TAB Plug CON

Commissioner of Patents
Mail Stop ISSUE FEE
PO Box 1450
Alexandria, VA 22313-1450

RESPONSE AND TRANSMITTAL TO NOTICE TO FILE CORRECTED APPLICATION PAPERS

In response to the Notice To File Corrected Application Papers dated July 2, 2012, Applicant hereby submits the following:

Amendment to Correct Informalities in Application Papers
Copy of Notice to File Corrected Application Papers

Respectfully submitted,

Dated: March 28, 2014

Alfred M. Walker
Attorney for Applicant
Reg. # 29,983

225 Old Country Road
Melville, New York 11747-2712
(631) 361-8737

CERTIFICATE OF ELECTRONIC TRANSMISSION

I certify that this correspondence is being transmitted by fax to the Commissioner for Patents, Mail Stop Issue Fee at 571-273-2885 on the date indicated below.

Date: March 28, 2014

Alfred M. Walker

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/526,514	06/18/2012	Peter Allen	120616 Allen TAB Plug CON	7327

4988 7590 04/08/2014

ALFRED M. WALKER
225 OLD COUNTRY ROAD
MELVILLE, NY 11747-2712

EXAMINER	
HAUGHTON, ANTHONY MICHAEL	
ART UNIT	**PAPER NUMBER**
2846	

MAIL DATE	DELIVERY MODE
04/08/2014	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Response to Rule 312 Communication	Application No. 13/526,514	Applicant(s)
	Examiner	Art Unit

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

1. ☒ The amendment filed on *28 March 2014* under 37 CFR 1.312 has been considered, and has been:

a) ☒ entered.

b) ☐ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.
Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

N.Y. Horne

PUBLISHING DIVISION

Receipt date: 07/27/2012	Application Number	13526514	13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2012-06-18	
(Not for submission under 37 CFR 1.99)	First Named Inventor	Peter Allen	
	Art Unit	2835	
	Examiner Name	to be assigned	
	Attorney Docket Number	120616 Allen TAB Plug CON	

	31	6913238	B2	2005-07-00	Bakker	entire document
	32	6926141	B2	2005-08-00	Montler	entire document
	33	7007912	B1	2006-03-00	Giuliani	entire document
	34	7,104,093 ~~7107093~~	B2	September 12, 2006 ~~2006-12-00~~	Ling	entire document
Change(s) applied to document, /P.A.P./ 1/21/2014	35	7255228	B2	2007-08-00	Kim	entire document
	36	7,315,443 ~~73154432~~	B2	2008-01-01	Allen	entire document
	37	7443665	B2	2008-10-28	Allen	entire document
	38	7499269	B2	2009-03-03	Allen	entire document
	39	7499270	B2	2009-03-03	Allen	entire document

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514 13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2012-06-18
(Not for submission under 37 CFR 1.99)	First Named Inventor	Peter Allen
	Art Unit	2835
	Examiner Name	to be assigned
	Attorney Docket Number	120616 Allen TAB Plug CON

	9	~~6477871~~ 6,477,870	B1	2002-11-00	Derman	entire document
Change(s) applied to document, /P.A.P./ 1/21/2014	10	6477871	B1	2002-11-00	Shaw	entire document
	11	6497125	B1	2002-12-00	Necchi	entire document
	12	6560710	B1	2003-05-00	Leyden	entire document
	13	6578394	B2	2003-06-00	Yin	entire document
	14	6581420	B1	2003-06-00	Ling	entire document
	15	6590767	B2	2003-07-00	Liao	entire document
	16	6612455	B2	2003-09-00	Byrne	entire document
	17	6684548	B1	2004-02-00	Petrus	entire document
	18	6689954	B2	2004-02-00	Vaughan	entire document
	19	6697252	B2	2004-02-00	Maeda	entire document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13526514
Filing Date	2012-06-18
First Named Inventor	Peter Allen
Art Unit	2835
Examiner Name	to be assigned
Attorney Docket Number	120616 Allen TAB Plug CON

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6237375	B1	2001-05-00	Wymer	entire document
	2	6,257,542 ~~6257542~~	B1	2001-07-00	Westfield	entire document
Change(s) applied to document, /P.A.P./ 1/21/2014	3	6275378	B1	2001-08-00	Lee	entire document
	4	6308928	B1	2001-10-00	Galant	entire document
	5	6317936	B1	2001-11-00	McDaid	entire document
	6	6331934	B1	2001-12-00	Helot	entire document
	7	6427499	B1	2002-08-00	Derman	entire document
	8	6443417	B2	2002-09-00	Galant	entire document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514	13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2012-06-18	
(Not for submission under 37 CFR 1.99)	First Named Inventor	Peter Allen	
	Art Unit	2835	
	Examiner Name	to be assigned	
	Attorney Docket Number	120616 Allen TAB Plug CON	

Change(s) applied to document, /D.D./ 1/27/2014	1	~~20030085125~~	A1	2003-05-00	Yatabe	20030085143	entire document
	2	20040007651	A1	2004-01-00	Williams		entire document
Change(s) applied to document, /P.A.P./ 1/21/2014	3	20050161557 ~~20040161557~~	A1	2005-07-00	Heintz		entire document
	4	20050150263	A1	2005-07-00	Murray		entire document
	5	20050247584	A1	2005-11-00	Lu		entire document
	6	20060032877	A1	2006-02-00	Obolo		entire document
	7	20070205125	A1	2007-09-00	Ikebe		entire document
	8	20070235493	A1	2007-10-00	Fortson		entire document

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

Receipt date: 07/27/2012	Application Number	13526514	13526514 - GAU: 2835
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2012-06-18	
(Not for submission under 37 CFR 1.99)	First Named Inventor	Peter Allen	
	Art Unit	2835	
	Examiner Name	to be assigned	
	Attorney Docket Number	120616 Allen TAB Plug CON	

	20	6705133	B1	2004-03-00	Avganim	entire document
	21	6708966	B1	2004-03-00	Troudt	entire document
	22	6711921	B1	2004-03-00	Yang	entire document
	23	6735990	B1	2004-05-00	Murray	entire document
	24	6755056	B2	2004-06-00	Igelmund	entire document
	25	6763690	B2	2004-07-00	Galant	entire document
Change(s) applied to document, /D.D./ 1/27/2014	26	6788216	B2	2004-09-00	~~Sevier~~ Chen	entire document
	27	6796536	B1	2004-09-00	Sevier	entire document
	28	6810698	B2	2004-11-00	Weinraub	entire document
	29	6820362	B1	2004-11-00	Petrus	entire document
Change(s) applied to document, /P.A.P./ 1/21/2014	30	6,865,914 ~~68659144~~	B2	2005-03-00	Irgens	entire document

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.H./

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/526,514	05/06/2014	8717758	120616 Allen TAB Plug CON	7327

4988 7590 04/16/2014

ALFRED M. WALKER
225 OLD COUNTRY ROAD
MELVILLE, NY 11747-2712

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Peter Allen, Locust Valley, NY;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court New York - Eastern District on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
14cv 6659-ADS/SIL	11/12/2014	New York - Eastern District

PLAINTIFF	DEFENDANT
Think Products, Inc.	ACCO Brands Corporation ACCO Brands USA LLC

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	8,717,758	5/6/2014	Think Products, Inc.
2	8,837,144	9/16/2014	Think Products, Inc.
3			
4			
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
Douglas C. Palmer	Karen McMorrow	11/13/2014

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy