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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/920,955	01/18/2022	11227181	16223-00341	2833

33772 7590 12/28/2021
MCDONALD HOPKINS LLC
600 Superior Avenue, East
Suite 2100
CLEVELAND, OH 44114-2653

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.

INVENTOR(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional inventors):

Chester O.D. Thompson, Painesville, OH;
William R. Mutch, North Ridgeville, OH;

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

HY-KO PRODUCTS COMPANY, Northfield, OH

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IR103 (Rev. 10/09)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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)

33772 7590 11/03/2021
MCDONALD HOPKINS LLC
600 Superior Avenue, East
Suite 2100
CLEVELAND, OH 44114-2653

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
EFS (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/920,955	03/14/2018	Chester O.D. Thompson	16223-00341	2833

TITLE OF INVENTION: KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	02/03/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
HAUSMANN, MICHELLE M	2661	382-216000

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 03-09 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 McDonald Hopkins LLC

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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

HY-KO PRODUCTS COMPANY LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

PORTAGE, MICHIGAN

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 130265

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

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.

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.

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 /Mark J. Masterson/

Date December 7, 2021

Typed or printed name Mark J. Masterson

Registration No. 71886

Electronic Patent Application Fee Transmittal				
Application Number:		15920955		
Filing Date:		14-Mar-2018		
Title of Invention:		KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING		
First Named Inventor/Applicant Name:		Chester O.D. Thompson		
Filer:		Mark Jason Masterson/Danielle Mueller		
Attorney Docket Number:		16223-00341		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	600	600

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				600

Electronic Acknowledgement Receipt	
EFS ID:	44454089
Application Number:	15920955
International Application Number:	
Confirmation Number:	2833
Title of Invention:	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING
First Named Inventor/Applicant Name:	Chester O.D. Thompson
Customer Number:	33772
Filer:	Mark Jason Masterson/Danielle Mueller
Filer Authorized By:	Mark Jason Masterson
Attorney Docket Number:	16223-00341
Receipt Date:	07-DEC-2021
Filing Date:	14-MAR-2018
Time Stamp:	14:49:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 600
RAM confirmation Number	E2021B7E50064576
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	10001284.pdf	114238	no	1
			6b69137563fe8f35c55ee6cebdabf165355d61c2		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	38223	no	2
			1bd4482d7dd01db00f712637216064b6f5b086dd		
Warnings:					
Information:					
Total Files Size (in bytes):			152461		
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.					



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33772	7590	11/17/2021
MCDONALD HOPKINS LLC		
600 Superior Avenue, East		
Suite 2100		
CLEVELAND, OH 44114-2653		

EXAMINER	
HAUSMANN, MICHELLE M	

ART UNIT	PAPER NUMBER
2661	

NOTIFICATION DATE	DELIVERY MODE
11/17/2021	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipmailbox@mcdonaldhopkins.com

Corrected Notice of Allowability	Application No. 15/920,955	Applicant(s) Thompson et al.	
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661	AIA (FITF) 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 8 October, 2021.
 ☐ 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 40-53 and 55-56. 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 _____.

/MICHELLE M ENTEZARI/ Primary Examiner, Art Unit 2661	

Doc code: IDS

PTO/SB/08a (01-10)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	
	Filing Date	2018-03-14
	First Named Inventor	Chester O.D. Thompson
	Art Unit	
	Examiner Name	
	Attorney Docket Number	16223-00341

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	8644619		2014-02-04	Thompson et al.	
	2	8634655		2014-01-21	Thompson et al.	
	3	8585029		2013-11-19	Ryai, Sr.	
	4	8532809		2013-09-10	Freeman	
	5	8128322		2012-03-06	Bass et al.	
	6	7918629		2011-04-05	Belflower et al.	
	7	7891919		2011-02-22	Bass et al.	
	8	7643685		2010-01-05	Miller	

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		
Filing Date		2018-03-14
First Named Inventor	Chester O.D. Thompson	
Art Unit		
Examiner Name		
Attorney Docket Number		16223-00341

9	7484446		2009-03-02	Gula	
10	7214011		2007-05-08	Ryai, Sr. et al.	
11	7163364		2007-01-16	Foscan et al.	
12	7114894		2006-10-03	Mueller et al.	
13	7114436		2006-10-03	Mueller	
14	7111894		2006-09-26	Kora et al.	
15	7010498		2006-03-07	Berstis	
16	6965911		2005-11-15	Coffman et al.	
17	6959862		2005-11-01	Neumark	
18	6895100		2005-05-17	Pacenzia et al.	
19	6839451		2005-01-04	Campbell et al.	

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Application Number		
Filing Date		2018-03-14
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Examiner Name		
Attorney Docket Number	16223-00341	

20	6839449		2005-01-04	Campbell et al.	
21	6836553		2004-12-28	Campbell et al.	
22	6817814		2004-11-16	Mueller	
23	6801829		2004-10-05	Kawai	
24	6711557		2004-03-23	Palaniappan	
25	6687565		2004-02-03	Wetterlin et al.	
26	6647308		2003-11-11	Prejean	
27	6641339		2003-11-04	Chies et al.	
28	6612142		2003-09-02	Capwell	
29	6602030		2003-08-05	Markbreit	
30	6588995		2003-07-08	Wills et al.	

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Application Number		
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31	6543972		2003-04-08	Cimino	
32	6478515		2002-11-12	Mueller	
33	6449381		2002-09-10	Yanovsky et al.	
34	6415931		2002-07-09	Mueller	
35	6406227		2002-06-18	Titus et al.	
36	D455104		2002-04-02	Hillman et al.	
37	6321430		2001-11-27	Goldman et al.	
38	6243960		2001-06-12	Andrews et al.	
39	6186711		2001-02-13	Mueller	
40	6185311		2001-02-06	Yanovsky et al.	
41	6179531		2001-01-30	Jaw	

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Application Number		
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Attorney Docket Number		16223-00341

42	6175638		2001-01-16	Yanovsky	
43	6152662		2000-11-28	Titus et al.	
44	6094953		2000-08-01	Evans	
45	6082580		2000-07-04	Mueller et al.	
46	6065911		2000-05-23	Almblad et al.	
47	6064747		2000-05-16	Wills et al.	
48	6059495		2000-05-09	Mueller et al.	
49	6053677		2000-04-25	Juchinewicz	
50	5997795		1999-12-07	Danforth et al.	
51	5997224		1999-12-07	Beauregard et al.	
52	5984597		1999-11-16	Chen	

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53	5982491		1999-11-09	Breyer et al.	
54	5966457		1999-10-12	Lemelson	
55	5964554		1999-10-12	Drori	
56	5940229		1999-08-17	Baumgarten	
57	5926388		1999-07-20	Kimbrough et al.	
58	5908273		1999-06-01	Titus et al.	
59	5906365		1999-05-25	Wu	
60	5886775		1999-03-23	Houser et al.	
61	5855836		1999-01-05	Leyden et al.	
62	5807042		1998-09-15	Almblad et al.	
63	5771176		1998-06-23	Froehlich et al.	

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Attorney Docket Number		16223-00341

64	5764156		1998-06-09	Chaloux	
65	5739766		1998-04-14	Chaloux	
66	5711643		1998-01-27	Parr et al.	
67	5771176		1998-06-23	Froehlich et al.	
68	5677522		1997-10-14	Rice et al.	
69	5676504		1997-10-14	Mueller et al.	
70	5671523		1997-09-30	Juchinewicz	
71	RE35518		1997-05-27	Sussina	
72	5660509		1997-08-26	Cole et al.	
73	5630332		1997-05-20	Aldieri et al.	
74	5617323		1997-04-01	Stansberry et al.	

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	First Named Inventor	Chester O.D. Thompson	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		16223-00341

75	5607267		1997-03-04	Heredia et al.	
76	5594652		1997-01-14	Penn et al.	
77	5592728		1997-01-14	Susnjara	
78	5583443		1996-12-10	McMurtry et al.	
79	5556240		1996-09-17	Almblad	
80	5555176		1996-09-10	Menhennett et al.	
81	5552992		1996-09-03	Hunter	
82	5545367		1996-08-13	Bae et al.	
83	5543103		1996-08-06	Hogan et al.	
84	5538374		1996-07-23	Cole et al.	
85	5515903		1996-05-14	Hronas et al.	

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86	5503785		1996-04-02	Crump et al.	
87	5497888		1996-03-12	Michaels et al.	
88	5496138		1996-03-05	Drori	
89	5485399		1996-01-16	Saigo et al.	
90	5443339		1995-08-22	Heredia et al.	
91	5441369		1995-08-15	Foscan et al.	
92	5429202		1995-07-04	Millard et al.	
93	5416591		1995-05-16	Yoshimura et al.	
94	5393967		1995-02-28	Rice et al.	
95	5382784		1995-01-17	Eberhardt	
96	5365812		1994-11-22	Harnden	

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97	5363463		1994-11-08	Kleinerman	
98	5360299		1994-11-01	Oliana	
99	5351409		1994-10-04	Heredia	
100	5330168		1994-07-19	Enomoto et al.	
101	D348393		1994-07-05	Neitzke et al.	
102	5314274		1994-05-24	Heredia et al.	
103	5311758		1994-05-17	Neitzke et al.	
104	5311756		1994-05-17	Villani	
105	5311286		1994-05-10	Pike	
106	5308360		1994-05-03	Neitzke et al.	
107	5307151		1994-04-26	Hof et al.	

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	108	5293687		1994-03-15	Willoughby, Jr. et al.	
	109	5271698		1993-12-21	Heredia et al.	
	110	5259708		1993-11-09	Brice	
	111	5255199		1993-10-19	Barkman et al.	
	112	5244321		1993-09-14	Sopko	
	113	5229619		1993-07-20	Van Amstel	
	114	5201203		1993-04-13	Almblad	
	115	5192469		1993-03-09	Smalley et al.	
	116	5171112		1992-12-15	Roland	
	117	5167171		1992-12-01	Heredia	
	118	5165315		1992-11-24	Terada	

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	119	5146689		1992-09-15	Roland	
	120	5144561		1992-09-01	Soper	
	121	5139246		1992-08-18	Yakou	
	122	5130064		1992-07-14	Smalley et al.	
	123	5128531		1992-07-07	Fadel	
	124	5127532		1992-07-07	Cimino et al.	
	125	5122018		1992-06-16	Zion	
	126	5119190		1992-06-02	Lemelson	
	127	5111056		1992-05-05	Yoshimura et al.	
	128	5096346		1992-03-17	Ueda	
	129	5094538		1992-03-10	Reedman et al.	

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	130	5088864		1992-02-18	Yanagida	
	131	5083759		1992-01-28	Pollak et al.	
	132	5058940		1991-10-22	Hart	
	133	5056204		1991-10-15	Bartschi	
	134	5043144		1991-08-27	Gordon et al.	
	135	5029459		1991-07-09	Almblad	
	136	4998349		1991-03-12	Killeen	
	137	4993291		1991-02-19	Sopko	
	138	4971489		1990-11-20	Womack	
	139	4969782		1990-11-13	Castain	
	140	4941335		1990-07-17	Allen	

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	141	4929843		1990-05-29	Chmielewski, Jr. et al.	
	142	4929129		1990-05-29	Dickson	
	143	4909892		1990-03-20	Quinn et al.	
	144	4899391		1990-02-06	Cimino et al.	
	145	4898504		1990-02-06	Agius et al.	
	146	4868559		1989-09-19	Pinnow	
	147	4853866		1989-08-01	Andrada Galan et al.	
	148	4848116		1989-07-18	Lizotte	
	149	4845764		1989-07-04	Ueda et al.	
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152	4821393		1989-04-18	Spigarelli	
153	4821200		1989-04-11	Oberg	
154	4809341		1989-02-28	Matsui et al.	
155	4805224		1989-02-14	Koezuka et al.	
156	4803371		1989-02-07	Durland	
157	4783829		1988-11-08	Miyakawa et al.	
158	4780032		1988-10-25	Uyeda et al.	
159	4767110		1988-08-30	Yang	
160	4741652		1988-05-03	Marchal	
161	4717294		1988-01-05	Grasser	
162	4710808		1987-12-01	Hoogenboom et al.	

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163	4697300		1987-10-06	Warlop	
164	4687389		1987-08-18	Santii et al.	
165	4679331		1987-07-14	Koontz	
166	4677835		1987-07-07	Almblad	
167	4671711		1987-06-09	Steinbach et al.	
168	4666351		1987-05-19	Marchal	
169	4657448		1987-04-14	Alexander	
170	4656590		1987-04-07	Ace	
171	4653104		1987-03-24	Tamura	
172	4652765		1987-03-24	Nishihara	
173	4652738		1987-03-24	Nishihara et al.	

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	174	4651604		1987-03-24	Almblad et al.	
	175	4648585		1987-03-10	Yang	
	176	4647028		1987-03-03	Yang	
	177	4638567		1987-01-27	Leversee	
	178	4625107		1986-11-25	Planke	
	179	4614465		1986-09-30	Wu	
	180	4601185		1986-07-22	Sheldon	
	181	4592683		1986-06-03	Wu	
	182	4562759		1986-01-07	Schmitt	
	183	4558215		1985-12-10	Kaneko et al.	
	184	4557488		1985-12-10	Litherland	

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185	4553844		1985-11-19	Nakagawa et al.	
186	4551046		1985-11-05	Kinas	
187	4545569		1985-10-08	Schroder et al.	
188	4541760		1985-09-17	Zoueki	
189	4526498		1985-07-02	Fieldhouse	
190	4525908		1985-07-02	Bernstein	
191	4521142		1985-06-04	Juskevici	
192	4479673		1984-10-30	Inaba et al.	
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194	4468994		1984-09-04	Lieptz	
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196	4437150		1984-03-13	Dahlgren, Jr. et al.	
197	4433487		1984-02-28	Roland	
198	4432142		1984-02-21	Korsak	
199	4426179		1984-01-17	Jefferson	
200	4373414		1983-02-15	Agius	
201	4359299		1982-11-16	Sagarian	
202	4354780		1982-10-19	Bougiouris	
203	4301373		1981-11-17	Sjodin	
204	4300836		1981-11-17	Holmes, Jones F. et al.	
205	4300170		1981-11-10	Sakamoto	
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	207	4294096		1981-10-13	Heimann	
	208	4283859		1981-08-18	Roland	
	209	4281379		1981-07-28	Austin	
	210	4256423		1981-03-17	Juskevic	
	211	4251173		1981-02-17	Saucedo	
	212	4257758		1981-01-06	Limacher	
	213	4233746		1980-11-18	Troillet	
	214	4223791		1980-09-23	Taggart	
	215	4188163		1980-02-12	Juskevic	
	216	4172632		1979-10-30	Holmes, Jr.	
	217	4171161		1979-10-16	Jung	

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	218	4166949		1979-09-04	Pold et al.	
	219	D251365		1979-03-20	Lipinski	
	220	4143582		1979-03-13	Heimann	
	221	4132151		1979-01-02	Weber	
	222	4121292		1978-10-17	Galanis et al.	
	223	4117763		1978-10-03	Uyeda	
	224	4105340		1978-08-08	Kempf	
	225	4092806		1978-06-06	Wich	
	226	4090303		1978-05-23	Uyeda	
	227	4088060		1978-05-09	Johns	
	228	4062261		1977-12-13	Stahl	

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	229	4051748		1977-10-04	Sherman	
	230	4023464		1977-05-17	Zion	
	231	4019415		1977-04-26	Wich	
	232	4012991		1977-03-22	Uyeda	
	233	3981214		1976-09-21	Wich	
	234	3978764		1976-09-07	Patriquin	
	235	3956968		1976-05-18	Crasnianski	
	236	3955179		1976-05-04	Planke	
	237	3945298		1976-03-23	Cockroft	
	238	3919920		1975-11-18	Schlage	
	239	3919589		1975-11-11	Hanak	

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	240	3902382		1975-09-02	Lieptz	
	241	3884121		1975-05-20	Agius	
	242	3880047		1975-04-29	Dosier	
	243	3870895		1975-03-11	Lax et al.	
	244	3865011		1975-02-11	Patriquin	
	245	3848235		1974-11-12	Lewis et al.	
	246	3826555		1974-07-30	Matsumoto	
	247	3810416		1974-05-14	Nelms, Jr.	
	248	3807276		1974-04-30	Oliver	
	249	3796130		1974-03-12	Gartner	
	250	3795174		1974-03-05	Oliver et al.	

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251	3792639		1974-02-19	Richens et al.	
252	3773360		1973-11-20	Timbers	
253	3769865		1973-11-06	Kleist	
254	Re27665		1973-06-12	Spain	
255	3722341		1973-03-27	Hungerford, Jr. et al.	
256	3707999		1973-01-02	Coats	
257	3682041		1972-08-08	Essig	
258	3675536		1972-07-11	Hungerford, Jr. et al.	
259	3656402		1972-04-18	French	
260	3633451		1972-01-11	Lieptz	
261	3651573		1972-03-28	Kaplan	

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262	3625111		1971-12-07	Carlo et al.	
263	3602092		1971-08-31	Richens	
264	3599147		1971-08-10	Rogers et al.	
265	Re26848		1970-04-07	Simon	
266	3499366		1970-03-10	Spain	
267	3496636		1970-02-24	Lieptz	
268	3466747		1969-09-16	Patriquin et al.	
269	3457831		1969-07-29	Adler et al.	
270	3442174		1969-05-06	Weiner et al.	
271	3440906		1969-04-29	Allen	
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273	3429207		1969-02-25	John	
274	3424056		1969-01-28	Stolove et al.	
275	3418882		1968-12-31	Brand	
276	3388619		1968-06-18	Schreiber et al.	
277	3323420		1967-06-06	Roxburgh	
278	3305100		1967-02-21	Barbee	
279	3286597		1966-11-22	Schwartz	
~~280~~	~~32850590~~		~~1966-11-22~~	~~Eieptz~~	
281	3276328		1966-10-04	Schreiber et al.	
282	3259022		1966-07-05	Vietorisz	
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	284	3245149		1966-04-12	Haggstrom	
	285	3172969		1965-03-09	Haggstrom	
	286	3138999		1964-06-30	Haggstrom	
	287	3094039		1963-06-18	Spain	
	288	3053149		1962-09-11	Rossetti	
	289	2940183		1960-06-14	Fromberg	
	290	2929177		1960-03-22	Sheps	
	291	2860884		1958-11-18	Sloan et al.	
	292	2728251		1955-12-27	Turner	
	293	2707335		1955-05-03	Falk	
	294	2645978		1953-07-21	Sejarto et al.	

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	295	2622485		1952-12-23	Martellotti	
	296	2605294		1952-07-29	Barnhart	
	297	2582012		1952-01-08	Currier	
	298	2556577		1951-06-12	Drake	
	299	2499124		1950-02-28	Zipp et al.	
	300	2445041		1948-07-13	Scholz	

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2	EP1976656	EP		2014-10-29	Hy-Ko Products Company		
3	EP0053730	EP		1981-10-31	Webb Service GmbH		
4	EP0133091	EP		1985-02-13	Societe Anonyme H.K. France		
5	EP0835720	EP		1998-04-15	Noran, S.L.		
6	FR2499435	FR		1982-08-13	Firme August Borkey Nachfolger		
7	GB2276106	GB		1994-09-21	Autokey (UK) Ltd.		
8	H04-250911	JP		1992-09-07	Ishikawajima Harima Heavy Ind.		
9	S63-311108	JP		1988-12-19	Kiki Kalihatsu Kogyo KK		
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11	291113	MX		2007-01-23	Hy-Ko Products Company		

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13	CH673612	CH		1990-03-30	Hans Zulliger		
14	WO2012096685	WO		2012-07-19	Hy-Ko Products Company		
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17	WO200201480	WO		2002-01-03	Almblad, Robert E.		
18	WO2001/057472	WO		2001-08-09	Machine Magic LLC		
19	WO1996/19309	WO		1996-06-27	Almblad, Robert E.		
20	WO1991/13535	WO		1991-09-05	ATS Automation Tooling Systems Inc.		
21	WO1990/03867	WO		1990-04-19	Silca S.P.A.		
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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	/Mark J. Masterson/	Date (YYYY-MM-DD)	2018-03-14
Name/Print	Mark J. Masterson	Registration Number	71886

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 records.
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. /M.M.E/~~



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

33772 7590 11/03/2021
MCDONALD HOPKINS LLC
600 Superior Avenue, East
Suite 2100
CLEVELAND, OH 44114-2653

EXAMINER

HAUSMANN, MICHELLE M

ART UNIT

PAPER NUMBER

2661

DATE MAILED: 11/03/2021

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/920,955	03/14/2018	Chester O.D. Thompson	16223-00341	2833

TITLE OF INVENTION: KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	02/03/2022

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: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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)

33772 7590 11/03/2021
MCDONALD HOPKINS LLC
600 Superior Avenue, East
Suite 2100
CLEVELAND, OH 44114-2653

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/920,955	03/14/2018	Chester O.D. Thompson	16223-00341	2833

TITLE OF INVENTION: KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$600	\$0.00	\$0.00	\$600	02/03/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
HAUSMANN, MICHELLE M	2661	382-216000

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 03-09 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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). 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. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

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.

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.

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. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/920,955	03/14/2018	Chester O.D. Thompson	16223-00341	2833
33772 7590 11/03/2021 MCDONALD HOPKINS LLC 600 Superior Avenue, East Suite 2100 CLEVELAND, OH 44114-2653			EXAMINER HAUSMANN, MICHELLE M	
			ART UNIT 2661	PAPER NUMBER
DATE MAILED: 11/03/2021				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

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 30 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.

Notice of Allowability	Application No. 15/920,955	Applicant(s) Thompson et al.	
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661	AIA (FITF) 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 8 October 2021.
☐ 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 40-53 and 55-56. 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 _____.

/MICHELLE M ENTEZARI/ Primary Examiner, Art Unit 2661	

DETAILED ACTION

Response to Amendment

1. Claims 40-53, 55, and 56 are pending. Claim 40 is amended.

Response to Arguments

2. Applicant's arguments, see page 5, filed 8 October, 2021, with respect to the double patenting rejection of claim 54 along with accompanying amendments have been fully considered and are persuasive. The double patenting rejection of claim 54 has been withdrawn.
3. Applicant's arguments, see pages 5-7, filed 8 October, 2021, with respect to the 35 USC 103 rejections of claims 40-53, 55, and 56 along with accompanying amendments have been fully considered and are persuasive. The 35 USC 103 rejections of claims 40-53, 55, and 56 have been withdrawn.

Allowable Subject Matter

4. **Claims 40-53, 55, and 56** are allowed.
5. The following is an examiner's statement of reasons for allowance: As noted above, arguments with respect to the prior art cited were persuasive. The following art is also cited as relevant, but not sufficient alone or in combination to disclose, teach or fairly suggest the subject matter of the independent claim, in particular "use a **single camera** to capture images of **multiple angles of the master key** to determine groove characteristics of each side of the blade of the master key **without removing the master key from the slot**" or does not predate the current application:

WO 2008066857 A2: A fully automatic key duplicating machine. A master key alignment module is movably disposed into and out of proximity with a master key clamping

module, the master key being aligned by the alignment module within the master key clamping module. A master key identification module is disposed in fixed relation to the master key clamping module and identifies a type of key secured in the master key clamping module. A central positioning base is provided automatically movable into and out of engagement with the key cutting module and optionally the alignment module, adapted to move the master key alignment module into proximity with the master key clamping module and adapted to secure a key blank to be cut at the key cutting module in accordance with the tooth pattern of a clamped master key [predates via AIA rules but does not predate under pre-AIA, current application is pre-AIA, does not specify imaging multiple angles]

Machine Translation JP 2003-155853 A: The housing 22 preferably includes a door (not shown) or some opening through which the master key 32 can be installed in the key identification system 20. The **door can be opened and closed automatically** by the controller during the key identification process (as described in more detail below). Alternatively, the door may be opened and closed manually by the user. As illustrated in FIGS. 1-3, the first light emitting surface 24 is preferably configured to receive the master key 32. It is envisioned that the master key 32 may be placed directly on the first light emitting surface 24, or a transparent support 142 (see FIG. 12) may be provided to receive the master key. The **uniform light** generated by the second light emitting surface 26 is generated by any **groove** or milling on the key blade, Once placed and the housing 22 door closed, the identification process then begins. The frame 38 ensures that the master key 32 is placed in the field of view of the receiver 28. Closing the door may initiate the identification process, or the user may press one of the buttons 36 to initiate the identification process [does not specify imaging multiple angles]

US 20210237175 A1: For example, the kiosk presents user interface 718 to a user 709 and receives information from the user to identify keys and select matching key blanks for copying and for handling programming and pairing of keys with vehicles. The algorithms may include: the **automatic detection of key features** (e.g., tip, shoulder (if applicable), bottom, top, blade width, shoulder to tip distance); the **auto-registration of a key image including the auto-rotation of the key**. The automatic algorithms can, without manual manipulation, extract key cut depths and key biting data with a high degree of accuracy [does not predate]

US 20050135891 A1: To operate the key cutting machine 10 in an automatic mode, the master key 110 and key blank 100 are placed in the appropriate jaws 12. The gauge fork 26 is used to **verify the proper position and alignment of the master key** 110 and key blank 100 and then rotated to an out of the way position as shown in FIG. 7. Without input from the user, the motor draws the carriage 18 to the left and the key pattern 112 of the master key 110 is cut into the blade 106 of the key blank 100 [does not specify imaging multiple angles]

US 9556649 B1: As with other key clamp embodiments, the key clamp 106 may clamp the key 50 in response to **manual operation of a user**, such as repositioning a knob, handle, or the like, or alternatively in response to an electronic motor. Embodiments comprising a second digital identifier 112 are also contemplated. The second digital identifier 112 may be positioned within the key identification system housing 102 at an **acute angle relative to a key blade** 52 maintained within the key receiving aperture 104. For example, the second digital identifier 112 may be **positioned at approximately 30, 45, or 60 degrees**, or alternatively anywhere between 0 and 90 degrees relative to a key blade 52 maintained within the key receiving aperture 104. Positioning of the first 110 and second 112 digital identifiers as described allows

for more accurate image capturing of the key blade 52 [does not specify imaging multiple angles]

US 7891919 B2: Prior to clamping the key blank 24 in the clamping assembly 64, the key blank 24 may be aligned to insure a key pattern is properly cut into the blank 24. The position of the key blank 24, as **initially manually positioned by the user**, may be determined from the captured image of the blank 24. This image is analyzed by logic and compared to the ideal position for cutting the blank 24, and the positioning of the blank 24 is adjusted to conform to the ideal cutting position. In one embodiment, surface features of the blade 32 may be determined by positioning the **optical imaging device 50 to an angle** with respect to the surface of the blade 32. As best shown in FIGS. 9 and 10, a pair of key positioner fingers 72 and 74 engages the key blank 24 to align the blank 24. The left positioner finger 72 engages the left side of the blade 32, and the right positioner finger 74 engages the right side of the blade 24. This engagement squares the key blank 24 with respect to the X-axis and Y-axis to correct for a user having placed the blank 24 into the slot 20 at an angle. The engagement of the fingers 72 and 74 may also properly position the blade 32 along the X-axis. If the user did not insert the blank 24 far enough into the slot 20, **the fingers 72 and 74 may move the blade 32 along the X-axis to the proper position**. As previously described, the retention mechanism 19 secures a blank key 24; however, the force applied to a key 22 and 24 by the door clamp 14 and base 16 allows the key 22 and 24 to be adjusted relative to the machine 10 [same inventor, published Sep 2007 so predates application, but does not describe imaging at different angles]

US 9269136 B2: In an embodiment of the present disclosure, the measurements captured from the reflected image 200 by cut measurement module 630 discussed in detail above may be **automated without any user input** so that the user is not required to click on the reflected image 200 via user interface 280. Rather, the measurements may be automatically captured by cut measurement module 630 after the reflected image 200 has been captured by the user and submitted for measurements. Key replication computing device 605 may then detect where each cut is in the key and cut measurement module 630 may measure the depth of each cut in the key without the user selecting the maximum depth for each cut in the key. The automated measurement of the depths of each cut in the key by cut measurement module 630 may minimize the user error generated by the user not quite clicking on the maximum depth of each cut in the key via user interface 280 [does not specify imaging multiple angles]

US 20060147289 A1: Referring to FIG. 13, the relative cutting position of a held key blank 66 and a held and aligned key master 64 is shown with respect to cutter pin 132. The figure shows how apex 135 of guide section 134 of cutter pin 132 fits snugly into each biting or notch of key master and in doing so, **automatically and correctly positions the held key blank** 66 [does not specify imaging multiple angles]

US 5556240 A: A key positioning fixture facilitates the accurate duplication of double-sided key on a key cutting machine and includes a first key alignment element having an upper clamping element with a first clamping surface and a lower clamping element with a second clamping surface. A position control element engages the upper and lower clamping elements to control the spacing between the clamping surfaces to align the centerline of the key with the centerline of the first key alignment element. A second key alignment element engages the

first and second sides of the key blade to maintain the key in a fixed position. Referring now to FIGS. 64A, 64B and 64C, insertion of master key 958 into the master key alignment means 982 is illustrated. The **master key alignment** step for the particular embodiment of the invention illustrated in FIG. 64 should take place second in time relative to insertion of the key blank 936 into the key blank alignment means 976. If the master key 958 were to be inserted first without first manually laterally displacing the two cutter heads of the key cutting machine, the shoulder 972 of the master key would engage the interior edges of key followers 988 and improperly longitudinally index master key 958 with key shoulders 972 rather than with key tip 968 as is necessary with this tip indexed embodiment of the invention [does not specify imaging multiple angles]

US 8292556 B2: A key cutting machine has multiple modes of operation, including an **automatic mode of operation** wherein a clamp mechanism configured to hold a key blank is held without manual assistance in a position engaged with a key cutting element and a motor controls a movement of the clamp mechanism, a semi-automatic mode of operation wherein the clamp mechanism is held without manual assistance in a position engaged with the key cutting element and the motor does not control a movement of the clamp mechanism, and a manual mode of operation wherein the clamp mechanism is manually held in a position engaged with the key cutting element and the motor does not control a movement of the clamp mechanism.

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

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHELLE M ENTEZARI HAUSMANN whose telephone number is (571)270-5084. The examiner can normally be reached 10-7 M-F.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, VINCENT M RUDOLPH can be reached on (571)272-8243. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MICHELLE M ENTEZARI/
Primary Examiner, Art Unit 2661

Notice of References Cited	Application/Control No. 15/920,955		Applicant(s)/Patent Under Reexamination Thompson et al.	
	Examiner MICHELLE M ENTEZARI HAUSMANN		Art Unit 2661	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20210237175-A1	08-2021	Robertson; Douglas Lawrence	G05B19/4093	1/1
*	B	US-20050135891-A1	06-2005	Ryai, Richard Wm. SR.	B23Q11/0075	409/81
*	C	US-9556649-B1	01-2017	Mueller; Michael A.	G06K9/6267	1/1
*	D	US-7891919-B2	02-2011	Bass; Michael A.	G06K9/48	409/82
*	E	US-9269136-B2	02-2016	Day; James W.	G01B11/14	1/1
*	F	US-20060147289-A1	07-2006	Gimelfarb; Grigory	B21D53/42	409/277
*	G	US-5556240-A	09-1996	Almblad; Robert E.	B23C3/35	409/81
*	H	US-8292556-B2	10-2012	Ryai, Sr.; Richard Wm.	B23Q11/0075	409/83
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N	WO-2008066857-A2	06-2008	WO	FREEMAN ARI	B23C3/35
	O	JP-2003155853-A	05-2003	JP	CAMPBELL, JOHN	B23C3/35
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Machine Translation JP 2003-155853 A (Year: 2003)
	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.

U.S. Patent and Trademark Office
PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 20211025

Issue Classification 	Application/Control No. 15/920,955	Applicant(s)/Patent Under Reexamination Thompson et al.
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661

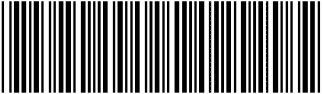
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Symbol					Type	Version
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G06K	/	9	/	00208	I	2013-01-01
G06K	/	9	/	209	I	2013-01-01
G06T	/	7	/	62	I	2017-01-01
G06K	/	9	/	6202	I	2013-01-01
B23C	/	3	/	35	I	2013-01-01
G06K	/	9	/	2036	I	2013-01-01
H04N	/	5	/	247	I	2013-01-01
Y10T	/	409	/	300952	A	2015-01-15
Y10T	/	409	/	301064	A	2015-01-15
Y10T	/	409	/	301008	A	2015-01-15
B23C	/	2235	/	41	A	2013-01-01
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G06T	/	2207	/	10141	A	2013-01-01

CPC Combination Sets					
Symbol	Type	Set	Ranking	Version	
/		/			

NONE (Assistant Examiner)		Total Claims Allowed: 16	
(Date) /MICHELLE M ENTEZARI/ Primary Examiner, Art Unit 2661 (Primary Examiner)		25 October 2021 (Date) O.G. Print Claim(s) 1	
		O.G. Print Figure 14	

U.S. Patent and Trademark Office

Part of Paper No.: 20211025

Issue Classification 	Application/Control No. 15/920,955	Applicant(s)/Patent Under Reexamination Thompson et al.
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661

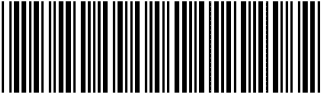
INTERNATIONAL CLASSIFICATION			
CLAIMED			
G06K	/	9	/ 48
G06K	/	9	/ 00
G06K	/	9	/ 20
G06K	/	9	/ 62
G06T	/	7	/ 62
B23C	/	3	/ 35
H04N	/	5	/ 247

NON-CLAIMED			
	/		/

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 16	
/MICHELLE M ENTEZARI/ Primary Examiner, Art Unit 2661 (Primary Examiner) _____ (Date) 25 October 2021		O.G. Print Claim(s) 1	O.G. Print Figure 14

Issue Classification 	Application/Control No. 15/920,955	Applicant(s)/Patent Under Reexamination Thompson et al.
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	40	10	49												
2	41	11	50												
6	42	12	51												
7	43	13	52												
3	44	14	53												
4	45		54												
5	46	15	55												
8	47	16	56												
9	48														

NONE (Assistant Examiner) _____ (Date) _____		Total Claims Allowed: 16	
/MICHELLE M ENTEZARI/ Primary Examiner, Art Unit 2661 (Primary Examiner) _____ (Date) 25 October 2021		O.G. Print Claim(s) 1	O.G. Print Figure 14

U.S. Patent and Trademark Office

Part of Paper No.: 20211025

<i>Search Notes</i> 	Application/Control No. 15/920,955	Applicant(s)/Patent Under Reexamination Thompson et al.
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661

CPC - Searched*		
Symbol	Date	Examiner
B23C2235/12, 41 (keyword limited)	12/17&12/19/2019	Entezari
B23C3/35 (keyword limited)	12/17&12/19/2019	Entezari
G06K9/00208, 2036, 209, 48, 6202 (keyword limited)	12/17&12/19/2019	Entezari
G06T2207/10141 (keyword limited)	12/17&12/19/2019	Entezari
G06T7/62 (keyword limited)	12/17&12/19/2019	Entezari
H04N5/247 (keyword limited)	12/17&12/19/2019	Entezari
Y10T409/300952, 301008, 301064 (keyword limited)	12/17&12/19/2019	Entezari

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

<i>Search Notes</i> 	Application/Control No. 15/920,955	Applicant(s)/Patent Under Reexamination Thompson et al.
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661

Search Notes		
Search Notes	Date	Examiner
see EAST search, includes INV, IDS	12/17-12/21/2019	Entezari
see google scholar search	12/21/2019	Entezari
see ip.com search	12/21/2019	Entezari
see updated EAST search	08/04/2020	Entezari
see updated EAST search	4/2-4/4/2021	Entezari
see updated EAST search	10/22-10/25/2021	Entezari
see ip.com search	10/25/2021	Entezari
see google scholar search	10/25/2021	Entezari

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
B23C	2235/12, 41 (keyword limited)	10/25/2021	Entezari
B23C	3/35 (keyword limited)	10/25/2021	Entezari
G06K	9/00208, 2036, 209, 48, 6202 (keyword limited)	10/25/2021	Entezari
G06T	2207/10141 (keyword limited)	10/25/2021	Entezari
G06T	7/62 (keyword limited)	10/25/2021	Entezari
H04N	5/247 (keyword limited)	10/25/2021	Entezari
Y10T	409/300952, 301008, 301064 (keyword limited)	10/25/2021	Entezari

Bibliographic Data

Application No: 15/920,955

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged: /MICHELLE M ENTEZARI/

Examiner's Signature

Initials

Title:

KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE
SCANNING

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
03/14/2018	382	2661	16223-00341
RULE			

APPLICANTS

HY-KO PRODUCTS COMPANY, Northfield, OH, UNITED STATES

INVENTORS

Chester O.D. Thompson, Painesville, OH, UNITED STATES

William R. Mutch, North Ridgeville, OH, UNITED STATES

CONTINUING DATA

This application is a CON of 15351634 11/15/2016 PAT 9934448

15351634 is a CON of 14162157 01/23/2014 PAT 9514385

14162157 is a CON of 12772709 05/03/2010 PAT 8644619

12772709 has PRO of 61275654 09/01/2009

12772709 has PRO of 61215152 05/01/2009

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

04/10/2018

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UNITED STATES

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Web Search History

date, time	web site	search string
10/25/2021 10:10:55 AM	Google Scholar	key blank copying camera blade angles without removing from housing platform
10/25/2021 10:11:41 AM	Google Scholar	key blank "master key" copying camera blade angles without removing from housing
10/25/2021 10:42:27 AM	Google Scholar	duplication machine key "blank" "master key" blade angles without user
10/25/2021 10:43:51 AM	Google Scholar	duplication machine "blank" "master key" leave in place during copying
10/25/2021 10:45:08 AM	Google Scholar	duplication machining "blank" "master key" without user intervention
10/25/2021 10:46:15 AM	Google Scholar	key duplication "blank" "master key" door closed during operation groove angles

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DAI+NPL

key blank "master key" copying camera blade angles wi...

Visuals

Query

Results

0 Selected

Relevance

None

No

1 - 50

1

Key manufacturing method

☐ The method of manufacturing the copy key 22 applies the use of the scanning device 100 to capture the physical profile of the configuration can be assigned as the only code and...
 CURRENT ASSIGNEES: PREJEAN RONALD MARTIN
 KR20030032032A | KOREA APPLICATIONS | 23-APR-2003

2

Key manufacturing method

☐ The method of manufacturing the copy key 22 applies the use of the scanning device 100 to capture the physical profile of the data configuration can be assigned as unique code and...
 CURRENT ASSIGNEES: PREJEAN RONALD MARTIN
 KR100754563B1 | KOREA PATENTS | 05-SEP-2007

3

Key recognition system

☐ A method and system for identifying a key blank corresponding to a master key is provided. The system includes a housing, a housing and is disposed opposite the first source of...
 CURRENT ASSIGNEES: HILLMAN GROUP INC
 DE60213933T2 | GERMANY PATENTS | 15-MAR-2007

4

Systems and methods for creating duplicate keys

☐ The present invention generally relates to the field of replicating or copying keys. More specifically, the present invention relates to a master key and decoding the master key based on the...
 CURRENT ASSIGNEES: IKEYLESS LLC
 US20210237175 | US APPLICATIONS | 05-AUG-2021

5

Key identification system

☐ A system and method for identifying a key blank from a master key is provided. The system includes a housing, a first light source relative to the housing. And a second light source...
 CURRENT ASSIGNEES: HILLMAN GROUP INC
 JP2009155853A | JAPAN APPLICATIONS | 30-MAY-2003

6

Key blank identification system with groove scanning

☐ A key identification system is provided. The key identification system comprises an imaging system to capture an image of a master key from an angle between perpendicular and parallel...
 CURRENT ASSIGNEES: HY KO PROD CO LLC
 WO2010127352A2 | WIPO APPLICATIONS | 04-NOV-2010

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PAT+IPL

duplication machine key "blank" "master key" blade an...

Visuals

Query

Results

0 Selected

Relevance

None

Normal

1 - 50

1

Key duplication machine

☐

CURRENT ASSIGNEES: HY KO PROD CO LLC
EP2517826B1 | EPO PATENTS | 08-FEB-2017

2

Key duplication machine

☐

CURRENT ASSIGNEES: HY KO PROD CO LLC
EP3184238B1 | EPO PATENTS | 22-APR-2020

3

Key duplication machine

☐

Apparatus, methods, and other embodiments associated with a key duplication machine are described. In one embodiment, a member. The optical imaging device is capable of capturing an...

CURRENT ASSIGNEES: HY KO PROD CO LLC
EP1976656B1 | EPO PATENTS | 29-OCT-2014

4

Key duplication machine

☐

Apparatus, methods, and other embodiments associated with a key duplication machine are described. In one embodiment, a member. The optical imaging device is capable of capturing an...

CURRENT ASSIGNEES: HY KO PROD CO LLC
EP1976656A2 | EPO APPLICATIONS | 08-OCT-2008

5

Key duplication machine

☐

A key duplicating machine comprising: a key load position to receive a key; an antenna configured to communicate with a key position. -

CURRENT ASSIGNEES: HY KO PROD CO LLC
EP2517826A1 | EPO APPLICATIONS | 31-OCT-2012

6

Key duplication machine

☐

Apparatus, methods, and other embodiments associated with a key duplication machine are described. In one embodiment, a member. The optical imaging device is capable of capturing an...

CURRENT ASSIGNEES: HY KO PROD CO LLC
WO2007087389A2 | WIPO APPLICATIONS | 02-AUG-2007

7

Key duplication machine

☐

A key duplication machine (10) comprising: a key blank identification system comprising: an outer shell (228) having an openi key duplication machine to interface with said key...

CURRENT ASSIGNEES: HY KO PROD CO LLC
EP3184238A1 | EPO APPLICATIONS | 28-JUN-2017

InnovationQ⁺

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Discover

PAT + NPL

duplication machine "blank" "master key" leave in plac...

Visuals

Query

Results

0 Selected

Relevance

None

1 - 50

1. Key duplication machine

☐
A key duplicating machine comprising: a key load position to receive a key; an antenna configured to communicate with a k position. -

CURRENT ASSIGNEES: HY KO PROD CO LLC
EP2517826A1 | EPO APPLICATIONS | 31-OCT-2012

2. Key duplication machine

☐
CURRENT ASSIGNEES: HY KO PROD CO LLC
EP2517826B1 | EPO PATENTS | 08-FEB-2017

3. Key duplication machine

☐
A key duplication machine (10) comprising: a key blank identification system comprising: an outer shell (228) having an ope key duplication machine to interface with said key...

CURRENT ASSIGNEES: HY KO PROD CO LLC
EP3184238A1 | EPO APPLICATIONS | 28-JUN-2017

4. Key duplication machine

☐
Apparatus, methods, and other embodiments associated with a key duplication machine are described. In one embodiment member. The optical imaging device is capable of capturing an...

CURRENT ASSIGNEES: HY KO PROD CO LLC
WO2012096685A1 | WIPO APPLICATIONS | 19-JUL-2012

5. Key duplication machine

☐
CURRENT ASSIGNEES: HY KO PROD CO LLC
EP3184238B1 | EPO PATENTS | 22-APR-2020

6. Key duplication machine

☐
Apparatus, methods, and other embodiments associated with a key duplication machine are described. In one embodiment member. The optical imaging device is capable of capturing an...

CURRENT ASSIGNEES: HY KO PROD CO LLC
EP1976656B1 | EPO PATENTS | 28-OCT-2014

7. Key duplication machine

☐
Apparatus, methods, and other embodiments associated with a key duplication machine are described. In one embodiment member. The optical imaging device is capable of capturing an...

CURRENT ASSIGNEES: HY KO PROD CO LLC

InnovationQ+

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PAT+API

duplication machining "blank" "master key" without us..

Visuals

Query

Results

0 Selected

↓↑ Relevance

None

N

1 - 50

1. Sequentialized key duplication system

☐
An integrated key duplication machine includes a machine-based key identification module and a key cutting module. The machine identifies a first master key corresponding to a first master key. A key blank corresponding to the first master key is then cut using the key cutting module.

CURRENT ASSIGNEES: HILLMAN GROUP INC
US20140377027 | US APPLICATIONS | 25-DEC-2014

2. Sequentialized key duplication system

☐
An integrated key duplication machine includes a machine-based key identification module and a key cutting module. The machine identifies a first master key corresponding to a first master key. A key blank corresponding to the first master key is then cut using the key cutting module.

CURRENT ASSIGNEES: HILLMAN GROUP INC
US9950375 | US PATENTS | 24-APR-2018

3. Sequentialized key duplication system

☐
An integrated key duplication machine includes a machine-based key identification module and a key cutting module. The machine identifies a first master key corresponding to a first master key. A key blank corresponding to the first master key is then cut using the key cutting module.

CURRENT ASSIGNEES: HILLMAN GROUP INC
CA2834220C | CANADA PATENTS | 08-JAN-2019

4. Key duplication machine

☐
Apparatus, methods, and other embodiments associated with a key duplication machine are described. In one embodiment, an optical imaging device is capable of capturing an image of a key. The image is then processed to identify the key. The key is then duplicated using the key duplication machine.

CURRENT ASSIGNEES: HY KO PROD CO LLC
US20120243957 | US APPLICATIONS | 27-SEP-2012

5. Key duplication machine

☐
Apparatus, methods, and other embodiments associated with a key duplication machine are described. In one embodiment, an optical imaging device is capable of capturing an image of a key. The image is then processed to identify the key. The key is then duplicated using the key duplication machine.

CURRENT ASSIGNEES: HY KO PROD CO LLC
WO2007087389A2 | WIPO APPLICATIONS | 02-AUG-2007

6. Key duplication machine

☐
Apparatus, methods, and other embodiments associated with a key duplication machine are described. In one embodiment, an optical imaging device is capable of capturing an image of a key. The image is then processed to identify the key. The key is then duplicated using the key duplication machine.

CURRENT ASSIGNEES: HY KO PROD CO LLC
EP1976658A2 | EPO APPLICATIONS | 08-OCT-2008

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Discover

PAT+NPL

key duplication "blank" "master key" door closed durin..

Visuals

Query

Results

0 Selected

Relevance

None

N

1 - 50

1. Key blank identification system with groove scanning

☐
A key identification system is provided. The key identification system comprises an imaging system to capture an image of :
of a groove in the master key from an angle between...
CURRENT ASSIGNEES: HY KO PROD CO LLC
CN102686348A | CHINA APPLICATIONS | 19-SEP-2012

2. Key blank identification system with groove scanning

☐
A key identification system is provided. The key identification system comprises an imaging system to capture an image of :
master key from an angle between perpendicular and parallel...
CURRENT ASSIGNEES: H&P ACQUISITION LLC [+1]
US20100278437 | US APPLICATIONS | 04-NOV-2010

3. Key blank identification system with groove scanning

☐
A key identification system is provided. The key identification system comprises an imaging system to capture an image of :
master key from an angle between perpendicular and parallel...
CURRENT ASSIGNEES: HY KO PROD CO LLC
EP2424698A2 | EPO APPLICATIONS | 07-MAR-2012

4. Key blank identification system with groove scanning

☐
A key identification system is provided. The key identification system comprises an imaging system to capture an image of :
master key from an angle between perpendicular and parallel...
CURRENT ASSIGNEES: H&P ACQUISITION LLC [+1]
US8644619 | US PATENTS | 04-FEB-2014

5. Key blank identification system with groove scanning

☐
A key identification system is provided. The key identification system comprises an imaging system to capture an image of :
master key from an angle between perpendicular and parallel...
CURRENT ASSIGNEES: HY KO PROD CO LLC
WO2010127352A2 | WIPO APPLICATIONS | 04-NOV-2010

6. Key blank identification system with groove scanning

☐
A key identification system is provided. The key identification system comprises an imaging system to capture an image of :
master key from an angle between perpendicular and parallel...
CURRENT ASSIGNEES: H&P ACQUISITION LLC [+1]
US20110120683 | US APPLICATIONS | 07-MAR-2012

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S217	0	((ENTEZARI OR HAUSMANN).XP. OR (ENTEZARI OR HAUSMANN).XA.) AND REMOV\$3 NEAR3 KEY.CLM.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/22 21:49
S219	12	S218 and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2021/10/22 21:50
S218	17	without removing with master adj key	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/22 21:50
S220	89	(leav\$3 or fixed place) with master adj2 key and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2021/10/22 22:05
S221	89	S220 and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2021/10/22 22:07
S222	4	maintain\$3 near2 position with master adj key	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/22 22:15
S223	153	(close or closed or shut) near2 door same master adj key	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/22 22:16

S224	66	S223 and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2021/10/22 22:17
S225	222	(copy or copied or copying or duplicating or duplicated) near3 master adj key and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/22 22:19
S226	60	S225 and ((close or closed or shut) near2 door or leav\$3 or fixed adj2 place or (prevent or without) near2 (removing or removal))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/22 22:20
S227	2	"20080145163".pn. and (angle or angular or around or degrees or orientation or orient\$3 or rotat\$4 or spin)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/22 22:23
S229	2	S225 and (remain\$3 adj2 place)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/22 22:32
S228	0	S225 and (remain\$3 adj2 mounted)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/22 22:32
S230	6	S225 and without adj2 (manual or manually)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/22 22:33
S231	6	("20140139683" "20020191849" "20210237175").pn. and (without or fixed or stationary or place or remov\$3 oe rotat\$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2021/10/25 10:54

S232	4	("20140139683" "20020191849" "20210237175").pn. and (prevent\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2021/10/25 10:55
S233	2,837	(copy or copied or copying or duplicating or duplicated) and master adj key and @ad<"20090501" and (manual or manually or without with user or prevent\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/25 10:58
S234	833	(copy or copied or copying or duplicating or duplicated) and master adj key and @ad<"20090501" and (manual or manually or without or prevent\$3) near2 user	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/25 10:59
S236	9	S235 and S234	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/25 11:00
S235	77,753	((B23C2235/12 OR B23C2235/41 OR B23C3/35 OR G06K9/00208 OR G06K9/2036 OR G06K9/209 OR G06K9/48 OR G06K9/6202 OR G06T2207/10141 OR G06T7/62 OR H04N5/247 OR Y10T409/300952 OR Y10T409/301008 OR Y10T409/301064).CPC.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2021/10/25 11:00
S237	114	(copy or copied or copying or duplicating or duplicated or duplication) near2 key and master adj key and @ad<"20090501" and (automated or automatic or automatically) near3 (rotate or rotated or rotating or position or positioned or positioning or angle or orientation)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/25 11:50
S239	42	automatic with key.ti. and freeman near daniel.inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/25 11:57
S238	51	key.ti. and freeman near daniel.inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	NEAR	ON	2021/10/25 11:57

			DERWENT; IBM_TDB			
S243	2	"8292556".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2021/10/25 14:52
L1	1	15/920955 and angle	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/25 20:37
L2	1	"7891919".pn. and angle	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/10/25 20:39

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S241	1,918	S240 and (manual or manually or without or prevent\$3) near2 user	USPAT	NEAR	ON	2021/10/25 11:01
S240	11,345	((B23C2235/12 OR B23C2235/41 OR B23C3/35 OR G06K9/00208 OR G06K9/2036 OR G06K9/209 OR G06K9/48 OR G06K9/6202 OR G06T2207/10141 OR G06T7/62 OR H04N5/247 OR Y10T409/300952 OR Y10T409/301008 OR Y10T409/301064).CPC.)	USPAT	NEAR	OFF	2021/10/25 11:01
S242	140	S241 and imag\$3 near2 key	USPAT	NEAR	ON	2021/10/25 11:05

10/25/2021 9:24:07 PM

C:\Users\mentezari\Documents\EAST\Workspaces\15_920_955.wsp

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application: Chester O.D. Thompson Group Art Unit: 2661
Serial No.: 15/920,955 Examiner: Michelle M. Hausmann
Filing Date: March 14, 2018 Docket No.: 16223-00341
Confirmation No.: 2833
Title: KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

RESPONSE TO OFFICE ACTION

Applicant acknowledges receipt of the April 8, 2021 Non-Final Office Action, setting a shortened statutory period of reply of three months. As this Response is being filed electronically on October 8, 2021, along with a three month extension and appropriate fees, Applicant believes no additional fees are due. However, if any fees are required for filing this Response, please charge such fees to our Deposit Account No. 13-0265 identifying attorney docket number 16223-00341.

CLAIMS

What is claimed is:

1. 1-- 39. (Canceled)
40. (Currently Amended) A key duplication system comprising:
 - a housing;
 - a key identification system comprising:
 - a slot opening in the housing configured to receive the blade of a master key;
 - an imaging system including one [ore]or more cameras configured to record images of the master key and at least one light source, wherein the imaging system is configured to use a single camera to capture images of multiple angles of the master key to determine groove characteristics of each side of the blade of the master key while the master key is maintained in the slot without removing the master key from the slot;
 - and
 - a key cutting system configured to receive a key blank that the identification system has determined to be associated with the master key based on the groove characteristics of the master key and cut a key pattern of the master key into the key blank.
41. (Previously Presented) The key duplication system of claim 40 wherein the groove characteristics include a groove contour.
42. (Previously Presented) The key duplication system of claim 40 further comprising a user interface such as a monitor or a touch screen positioned on the housing.
43. (Previously Presented) The key duplication system of claim 42 wherein the user interface is configured to provide an output to the user or operator to facilitate key duplication.

44. (Previously Presented) The key duplication system of claim 41 wherein the user interface warns the user that a master key contains a computer chip.
45. (Previously Presented) The key duplication system of claim 41 wherein the user interface instructs the user to place the master key in or near a device designed to sense the presence of a computer chip.
46. (Previously Presented) The key duplication system of claim 45, wherein the system is configured as a self-serve kiosk.
47. (Previously Presented) The key duplication system of claim 40, wherein the one or more light sources includes a backlight.
48. (Previously Presented) The key duplication system of claim 40 wherein an image captured by the one or more cameras includes at least one backlight image.
49. (Previously Presented) The key duplication system of claim 40, wherein said characteristics of said contour includes outline data wherein said outline data includes a plurality of data points.
50. (Previously Presented) The key duplication system of claim 49, wherein said plurality of data points is selectively adjustable along an interval to adjust accuracy of groove identification.
51. (Previously Presented) The key duplication system of claim 40 further comprising a key holder configured to hold said master key.
52. (Previously Presented) The key duplication system of claim 51, wherein said key holder includes a clamp.
53. (Previously Presented) The key duplication system of claim 40, wherein a first image of said master key includes a groove in the bottom of a blade of said master key and wherein a second image of said master key includes a groove in the top of said blade of said master key.
54. (Canceled)

55. (Previously Presented) The key duplication system of claim 40 wherein the system is configured to store data related to the master key and key duplicating event.

56. (Previously Presented) The key duplication machine of claim 55, wherein the data is configured to be remotely communicated or downloaded for remote analysis.

REMARKS

The Non-Final Office Action identifies the following:

- Claim 54 is rejected on the ground of nonstatutory double patenting over claim 1 of US Patent No. 8,644,619 in view of Bass (US 2007/0224008);
- Claims 40, 42 – 45, 47, 48, 51, 52, 55 and 56 are rejected as being obvious over Bass;
- Claims 41, 44 and 45 are rejected as being obvious over Bass, further in view of Almblad (US 6065911);
- Claim 46 is rejected as being obvious over Bass and Almblad, further in view of Bass II (US 2004/0095380);
- Claim 49 is rejected as being obvious over Bass, further in view of Wills (US 2001/0033781)
- Claim 50 is rejected as being obvious over Bass, further in view of Miyashita (US 2004/0179190); and
- Claim 53 is rejected as being obvious over Bass, further in view of Campbell (US 6839451).

The following amendments and remarks address each of these issues and place the present application in condition for allowance. Notably, claims 1-39 and 54 are now canceled and claims 40-53 and 55-56 remain pending.

I. Double Patenting

Claim 54 is rejected on the ground of nonstatutory double patenting. Claim 54 has been canceled and this rejection is respectfully withdrawn.

II. §103 Rejections

Claims 40-56 stand rejected as allegedly obvious over various prior art references including Bass in view of Almblad, Bass II, Wills, Miyashita, and Campbell. In the remarks, the Examiner indicated the following:

“Examiner notes that claim 53 is a likely avenue towards allowance, if the claim is amended to indicate there is no operator intervention required to flip the key in order to get the two views, as Campbell et al. require a user manually flip the key. While claim 40 specifies “while the master key is maintained in the slot”, the claim language could mean the key is maintained in the slot while each image is taken, but flipped between images. Examiner recommends to indicate somehow the imaging of the top and bottom which include the grooves/milling pattern are imaged simultaneously without the need for an operator to physically flop the key between image captures.”

Applicant appreciates the comments provided. Claim 40 has been amended to recite features as suggested by the Examiner as well as portions of the features of claim 53. Claim 40 now recites in pertinent part:

“an imaging system including one [ore]or more cameras configured to record images of the master key and at least one light source, wherein the imaging system is configured to use a single camera to capture images of multiple angles of the master key to determine groove characteristics of each side of the blade of the master key ~~while the master key is maintained in the slot~~without removing the master key from the slot.”

It is respectfully submitted that these amendments are supported by the specification and figures of the application as originally filed and no new matter has been added. Further, Applicant submits that the cited prior art does not sufficiently teach the subject matter of amended claim 40. More particularly, the cited art fails to teach or otherwise disclose a key duplication system that includes a housing, a key identification system comprising a slot opening in the housing configured to receive the blade of a master key, an imaging system including one or more cameras configured to record images of the master key and at least one light source, wherein the imaging system is configured to use a single camera to capture images of multiple angles of the master key to determine groove characteristics of each side of the blade of the master key without removing the master key from the slot; and a key cutting system as recited by claim 40.

Further, one skilled in the art would be deterred from combining Bass with Campbell to arrive at the subject matter of claim 40. This is because Bass teaches a key duplication machine having a housing with a slot for receiving just a blade of a key while, in contrast, Campbell discloses a garage type enclosure for receiving an entire key therein to be placed on a surface. For this reason, one would not look to combine Bass (key in slot version) with Campbell (key on surface in garage version) as these two systems operate in entirely different manners based on different structures. More particularly, the imaging system of Campbell

requires placing a key directly on a luminous surface with first and second receivers (28, 50) configured for taking images of the key from a common angle. See Figure 4.

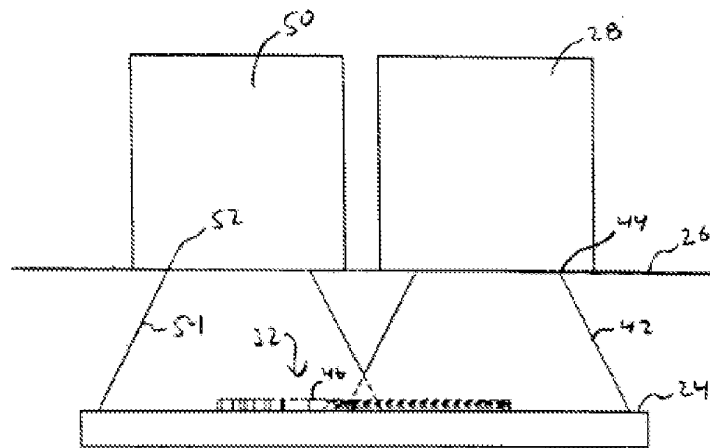


Fig. 4

This configuration would deter one skilled in the art from capturing images from multiple angles of the master key to determine groove characteristics of each side of the blade of the master key without removing the key from the system as recited by claim 40.

Thus, for at least this reason, the combination of any of the cited prior art references fails to amount to a *prima facie* case of obviousness as the combined teachings of the cited art fail to teach each and every feature as recited by the independent claim 40. For at least this reason, all remaining claims 40-53, and 55-56 are patentable over the cited references and are in condition for allowance.

CONCLUSION

In light of the foregoing, Applicants submits that the application is now in condition for acceptance. If the Examiner has any questions pertaining to the above, then the undersigned attorney would welcome a phone call to provide any further clarification or a formal interview.

Respectfully submitted,

Date: October 8, 2021

/Mark J. Masterson/
Mark J. Masterson – Reg. No. 71,886
McDonald Hopkins LLC
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Electronic Patent Application Fee Transmittal				
Application Number:		15920955		
Filing Date:		14-Mar-2018		
Title of Invention:		KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING		
First Named Inventor/Applicant Name:		Chester O.D. Thompson		
Filer:		Mark Jason Masterson/Danielle Mueller		
Attorney Docket Number:		16223-00341		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 3 months with \$0 paid	2253	1	740	740
Miscellaneous:				
Total in USD (\$)				740

Electronic Acknowledgement Receipt	
EFS ID:	43980946
Application Number:	15920955
International Application Number:	
Confirmation Number:	2833
Title of Invention:	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING
First Named Inventor/Applicant Name:	Chester O.D. Thompson
Customer Number:	33772
Filer:	Mark Jason Masterson/Danielle Mueller
Filer Authorized By:	Mark Jason Masterson
Attorney Docket Number:	16223-00341
Receipt Date:	08-OCT-2021
Filing Date:	14-MAR-2018
Time Stamp:	09:23:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$740
RAM confirmation Number	E202108023163251
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		9891830.pdf	172167	yes	8
			41b814af9dd6d28499ffe621cabe7503395271cd		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	4	
	Applicant Arguments/Remarks Made in an Amendment		5	8	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	38472	no	2
			d11a87dfb31cbbe04e5551762cd5859b3e1b580e		
Warnings:					
Information:					
Total Files Size (in bytes):			210639		

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.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/920,955	03/14/2018	Chester O.D. Thompson	16223-00341	2833

33772	7590	04/08/2021
MCDONALD HOPKINS LLC		
600 Superior Avenue, East		
Suite 2100		
CLEVELAND, OH 44114-2653		

EXAMINER	
HAUSMANN, MICHELLE M	

ART UNIT	PAPER NUMBER
2661	

NOTIFICATION DATE	DELIVERY MODE
04/08/2021	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipmailbox@mcdonaldhopkins.com

Office Action Summary	Application No. 15/920,955	Applicant(s) Thompson et al.	
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661	AIA (FITF) 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 MONTHS 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 2/10/2021.
☐ 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) 40-56 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) 40-56 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 ____ 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.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
 Paper No(s)/Mail Date ____.
- 3) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date ____.
- 4) ☐ Other: ____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 10, 2021 has been entered.

Response to Amendment

2. Claims 1-39 are canceled. Claims 40-56 are pending. Claims 40-56 are new.

Response to Arguments

3. Applicant's arguments with respect to claim(s) 1-39 have been considered but are moot because the new ground of rejection does not rely on any reference applied in the prior rejection of record for any teaching or matter specifically challenged in the argument, and as claims 1-39 are canceled.

4. **Claim 49** is rejected below under Wills et al., but it is noted the milling shape string of Cambell et al. could also teach this limitation. Examiner notes that **claim 53** is a likely avenue towards allowance, if the claim is amended to indicate there is no operator intervention required to flip the key in order to get the two views, as Campbell et al. require a user manually flip the key. While claim 40 specifies "while the master key is maintained in the slot", the claim language could mean the key is maintained in the slot while each image is taken, but flipped between images. Examiner recommends to indicate somehow the imaging of the top and bottom which include the grooves/milling pattern are imaged simultaneously without the need for an operator to physically flip the key between image captures.

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP § 2146 *et seq.* for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using

web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

6. **Claim 54** is rejected on the ground of nonstatutory double patenting as being unpatentable over claim 1 of U.S. Patent No. 8644619 in view of Bass et al. (US 20070224008 A1). As can be noted below, claim 54 has the additional features that are indicated below in the rejection of claim 40 under Bass et al. but are reiterated below this table.

40. A key duplication system comprising: a housing, a key identification system comprising: a slot opening in the housing configured to receive the blade of a master key; an imaging system including one or more cameras configured to record images of the master key and at least one light source, wherein the imaging system is configured to use a single camera to capture multiple angles of the master key to determine groove characteristics of each side of the blade of the master key while the master key is maintained in the slot; and a key cutting system configured to receive a key blank that the identification system has	1. A key identification system comprising: an imaging system configured to capture an image of the tip of a master key at an angle between perpendicular and parallel to the back of said master key and not including perpendicular or parallel to the blade of said master key, wherein said captured image of said tip includes a contour of a groove in said master key; and a logic configured to analyze said captured image to determine characteristics of said groove based on said contour and further to compare said characteristics of said groove with groove characteristics of known key blanks to determine the

determined to be associated with the master key based on the groove characteristics of the master key and cut a key pattern of the master key into the key blank. 54. The key duplication system of claim 40, one of said views of said master key includes a view from an angle between perpendicular and parallel to the blade of said master key and not including perpendicular or parallel to the blade of said master key,	likelihood of a match between said master key and a known key blank.

Bass et al. disclose a key duplication system comprising: a housing (machine 10 includes an outer shell 12, comprising a number of panels arranged to enclose and protect internal components, mechanisms, and systems of the key duplication machine, [0046]), a key identification system comprising: a slot opening in the housing configured to receive the blade of a master key (As illustrated in FIG. 5, the door clamp 14 and the base 16 form a slot 20 that may be utilized to retain or secure a master key 22 or key blank 24 such that the blade 32 of the key 22 and 24 is located within the machine 10, [0047]); an imaging system including one or more cameras configured to record images of the master key and at least one light source, wherein the imaging system is configured to use a single camera to capture multiple angles of the master key to determine groove characteristics of each side of the blade of the master key while the master key is maintained in the slot (positioning the optical imaging device 50 to an angle with respect to the surface of the blade 32, [0060], "Optionally, additional imaging of the

master key 22 may be performed to determine or quantify surface features of the master key 22 such as, for example, the keyway groove 34. Such surface features may assist in narrowing or choosing the proper key blank 24. Such imaging may be performed by providing a ring of structured light about the key blade 32 and an optical imaging device to record a tip view or cross-sectional view of the key 24, performing a laser scan across the key blade 32 to identify the width and spacing of a keyway groove 34, or projecting a shadow across the surface of the blade 32 to measure the variations in shadow contour related to surface area contour", [0062]) [tip view and cross-sectional view interpreted as multiple angles] [width and spacing of a keyway groove interpreted as groove characteristics]; and a key cutting system configured to receive a key blank that the identification system has determined to be associated with the master key based on the groove characteristics of the master key and cut a key pattern of the master key into the key blank (the captured images may be analyzed by logic to determine the proper key blank to be used for a duplicate key, validate the selection of the proper key blank, facilitate the accurate cutting of the key pattern of the master key into the key blank, [0040], determining the proper key blank for duplicating the master key, aligning the key blank; moving the key blank to a cutting zone of the machine; cutting the key pattern of the master key into the key blank, [0043]).

Claim Rejections - 35 USC § 103

7. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

8. The following is a quotation of pre-AIA 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, 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 negated by the manner in which the invention was made.

9. **Claims 40, 42-45, 47, 48, 51, 52, 55 and 56** is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Bass et al. (US 20070224008 A1).

Regarding claim 40, Bass et al. disclose a key duplication system comprising: a housing (machine 10 includes an outer shell 12, comprising a number of panels arranged to enclose and protect internal components, mechanisms, and systems of the key duplication machine, [0046]), a key identification system comprising: a slot opening in the housing configured to receive the blade of a master key (As illustrated in FIG. 5, the door clamp 14 and the base 16 form a slot 20 that may be utilized to retain or secure a master key 22 or key blank 24 such that the blade 32 of the key 22 and 24 is located within the machine 10, [0047]); an imaging system including one or more cameras configured to record images of the master key and at least one light source, wherein the imaging system is configured to use a single camera to capture multiple angles of the master key to determine groove characteristics of each side of the blade of the master key while the master key is maintained in the slot (positioning the optical imaging device 50 to an angle with respect to the surface of the blade 32, [0060], "Optionally, additional imaging of the master key 22 may be performed to determine or quantify surface features of the master key 22 such as, for example, the keyway groove 34. Such surface features may assist in narrowing or choosing the proper key blank 24. Such imaging may be performed by providing a ring of structured light about the key blade 32 and an optical

imaging device to record a tip view or cross-sectional view of the key 24, performing a laser scan across the key blade 32 to identify the width and spacing of a keyway groove 34, or projecting a shadow across the surface of the blade 32 to measure the variations in shadow contour related to surface area contour", [0062]) [tip view and cross-sectional view interpreted as multiple angles] [width and spacing of a keyway groove interpreted as groove characteristics]; and a key cutting system configured to receive a key blank that the identification system has determined to be associated with the master key based on the groove characteristics of the master key and cut a key pattern of the master key into the key blank (the captured images may be analyzed by logic to determine the proper key blank to be used for a duplicate key, validate the selection of the proper key blank, facilitate the accurate cutting of the key pattern of the master key into the key blank, [0040], determining the proper key blank for duplicating the master key, aligning the key blank; moving the key blank to a cutting zone of the machine; cutting the key pattern of the master key into the key blank, [0043]).

While Bass et al. do not use the language, "capture multiple angles of the master key", as Bass et al. indicate, "record a tip view or cross-sectional view of the key 24", it would have been obvious at the time of filing to one of ordinary skill in the art that these two views that are recorded indicate there are at least two (thereby multiple) angles of the key that are captured.

Regarding claim 42, Bass et al. disclose the key duplication system of claim 40. Bass et al. further indicate a user interface such as a monitor or a touch screen positioned on the housing (apparatus may include a user interface, such as monitor, touch screen, or other such device, through which a user may enter information and information may be displayed to the user, [0042], touch-screen monitor 40 is incorporated into the machine 10, [0051], "The hood

module 114 may provide structural support for the mounting or holding of components such as, for example, the monitor 40", [0088]).

Regarding claim 43, Bass et al. disclose the key duplication system of claim 42. Bass et al. further indicate the user interface is configured to provide an output to the user or operator to facilitate key duplication (user interface, such as monitor, touch screen, or other such device, through which a user may enter information and information may be displayed to the user, [0042], A touch-screen monitor 40 is incorporated into the machine 10, through which a user may enter information and information may be displayed to the user, [0051], The results of such a validation may be displayed to the user on the touch-screen monitor 40 or otherwise output to the user, [0078], "Once displayed on a touch-screen monitor, the user may initiate the duplication process by manually selecting one of the offered options... The user may select the preferred key blank by touching a graphic representation of one of the key blanks 200 and 202", [0089]).

Regarding claim 44, Bass et al. disclose the key duplication system of claim 41. Bass et al. further indicate the user interface warns the user that a master key contains a computer chip ("Regardless of the method used to identify a key blank, the machine may be arranged to warn a user that a master key to be copied may contain a computer chip, transponder, or the like. Such computer chips and transponders are common in automobile keys. Duplicates for such keys may need to include a corresponding computer chip in order for the duplicate to be successful. Once it is determined that a master key may have a computer chip, the user may be instructed to place the master key in or near a device designed to sense the presence of a

computer chip in a key. If the master key does include a computer chip, the user may be instructed on how to proceed to ensure a functional duplicate key is made", [0093]).

Regarding claim 45, Bass et al. disclose the key duplication system of claim 41. Bass et al. further indicate the user interface instructs the user to place the master key in or near a device designed to sense the presence of a computer chip (place the master key in or near a device designed to sense the presence of a computer chip in a key, [0093]).

Regarding claim 47, Bass et al. disclose the key duplication system of claim 40. Bass et al. further indicate the one or more light sources includes a backlight (system for providing backlighting to the key, [0057]-[0059]).

Regarding claim 48, Bass et al. disclose the key duplication system of claim 40. Bass et al. further indicate an image captured by the one or more cameras includes at least one backlight image (backlighting environment that enhances captured images of the key, [0057], Any particular configuration that provides well-dispersed and diffused light appropriate for backlighting is contemplated and incorporated herein. Alternatively, front lighting or providing light directly to the key 22 and 24 may also be used when capturing an image of the key 22 and 24, [0058], the backlighting may be adjusted, such as in direction or in intensity, to improve subsequent captured images, [0059]).

Regarding claims 51 and 52, Bass et al. disclose the key duplication system of claim 40. Bass et al. further indicate a key holder configured to hold said master key, wherein said key

holder includes a clamp (The combination of the door clamp 14, base 16, handle 18, and biasing member forms a retention mechanism 19 for retaining or securing a master key 22 or key blank 24. As illustrated in FIG. 5, the door clamp 14 and the base 16 form a slot 20 that may be utilized to retain or secure a master key 22 or key blank 24 such that the blade 32 of the key 22 and 24 is located within the machine 10. The force placed on the key 22 and 24 in the slot 20 is sufficient to retain or hold the key 22 and 24 in place but also allows some movement of the key 22 and 24 to facilitate proper alignment of the key 22 and 24, [0047]).

Regarding claim 55, Bass et al. disclose the key duplication system of claim 40. Bass et al. further indicate the system is configured to store data related to the master key and key duplicating event ("The logic may use the quantified and stored information from the captured image of the key pattern 36 of the master key 22 to calculate precise movements of the cutting wheels 60 and 62, with respect to the key blank 24, to produce a duplicate key", [0075], "The logic may be arranged to collect and store data regarding key duplications performed by the key duplication machine 10. For example, data regarding the number of key duplications performed, the number of different key blanks used in key duplication, the number of an individual key blank used in key duplication, success rate of duplicating keys, and the like may be collected and stored. Such information and data may be analyzed by the logic associated with the machine 10 or be downloaded for remote analysis", [0095]).

Regarding claim 56, Bass et al. disclose the key duplication system of claim 55. Bass et al. further indicate the data is configured to be remotely communicated or downloaded for remote analysis (Such information and data may be analyzed by the logic associated with the machine 10 or be downloaded for remote analysis", [0095]).

10. **Claim 41, 44 and 45** is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Bass et al. (US 20070224008 A1) as applied to claim 45 above, further in view of Alnblad et al. (US 6065911 A).

Regarding claim 41, Bass et al. disclose the key duplication system of claim 40. Bass et al. further indicate the groove characteristics include a groove contour ("Optionally, additional imaging of the master key 22 may be performed to determine or quantify surface features of the master key 22 such as, for example, the keyway groove 34. Such surface features may assist in narrowing or choosing the proper key blank 24. Such imaging may be performed by providing a ring of structured light about the key blade 32 and an optical imaging device to record a tip view or cross-sectional view of the key 24, performing a laser scan across the key blade 32 to identify the width and spacing of a keyway groove 34, or projecting a shadow across the surface of the blade 32 to measure the variations in shadow contour related to surface area contour", [0062], master key 24 silhouette and key groove 34 features, [0063]). To further teach this point however, an additional reference is provided herein.

Alnblad et al. teach a groove contour (extract three-dimensional grooves, col. 2, lines 30-35, identify curved grooves, col. 4, lines 35-40; extract laterally protected attributes such as groove characteristics using light stripe, col. 11, lines 5-25).

Bass et al. and Alnblad et al. are in the same art of key identification systems (Bass et al., abstract; Alnblad et al., abstract). The combination of Alnblad et al. with Bass et al. allows for identification of groove contours. It would have been obvious at the time of the invention to

one of ordinary skill in the art to combine the groove contours identification of Almlad et al., with the invention of Bass et al., as these identification techniques were well known at the time of the invention, incorporating the identification would have predictable results, and as one of a limited numbers of ways to identify a key, would have been obvious to try, and as Almlad et al. indicate this will result in an improved key making machine that automatically extracts characteristics of an object key without human intervention (abstract), thereby making the invention of Bass et al. as easy for customers to use as possible.

Regarding claim 44, Bass et al. and Almlad et al. disclose the key duplication system of claim 41. Bass et al. further indicate the user interface warns the user that a master key contains a computer chip ("Regardless of the method used to identify a key blank, the machine may be arranged to warn a user that a master key to be copied may contain a computer chip, transponder, or the like. Such computer chips and transponders are common in automobile keys. Duplicates for such keys may need to include a corresponding computer chip in order for the duplicate to be successful. Once it is determined that a master key may have a computer chip, the user may be instructed to place the master key in or near a device designed to sense the presence of a computer chip in a key. If the master key does include a computer chip, the user may be instructed on how to proceed to ensure a functional duplicate key is made", [0093]).

Regarding claim 45, Bass et al. and Almlad et al. disclose the key duplication system of claim 41. Bass et al. further indicate the user interface instructs the user to place the master key in or near a device designed to sense the presence of a computer chip (place the master key in or near a device designed to sense the presence of a computer chip in a key, [0093]).

11. **Claim 46** is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Bass et al. (US 20070224008 A1) and Almblad et al. (US 6065911 A) as applied to claim 45 above, further in view of Bass et al. (US 20040095380 A1) [referred to as Bass II].

Regarding claim 46, Bass et al. and Almblad et al. disclose the key duplication system of claim 45. Bass et al. further imply the system is configured as a self-serve kiosk (A general goal of the industry is to develop key duplication machines and processes that are so user-friendly that a customer or general consumer may duplicate a key with minimal instructions and minimal knowledge of keys, [0008]), however another reference is provided to make this more explicit.

Bass II teach a system key cutting configured as a self-serve kiosk ("Moreover, the system is explicitly designed for user friendliness, so as to eliminate that need for extensive training for any prospective user of the system. The system should have particular applicability in key blank identification and key duplication processes", abstract, "For example, with respect to a key identification system, the most practical implementation scheme may be through the use of a common, over-the-counter personal computer, in conjunction with the elements described below, so as to allow for easy and widespread implementation as a user-friendly kiosk in hardware stores and other retail locations", [0032], "Moreover, these lighted display racks could be installed as kiosks in retail stores, incorporated in vehicles or even specially designed to be transported in a convenient carrying case. Ultimately, the primary goal of these displays is to simplify and enhance the use of the system by its intended operators-consumers or inexperienced employees who have not been trained in the nuances of the identification process in question", [0041]).

The combination of Bass II et al. with Bass et al. and Almblad et al. allows for use of a kiosk. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the kiosk of Bass II et al., with the invention of Bass et al. and Almblad et al., as these identification techniques were well known at the time of the invention, incorporating the identification would have predictable results, and as Bass II et al. indicate the goal is, "so as to allow for easy and widespread implementation as a user-friendly kiosk in hardware stores and other retail locations", ([0032]), indicating the commercial benefits to the combination.

12. **Claim 49** is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Bass et al. (US 20070224008 A1) as applied to claim 40 above, further in view of Wills et al. (US 20010033781 A1).

Regarding claim 49, Bass et al. disclose the key duplication system of claim 40. Bass et al. further indicate said characteristics of said contour includes outline data wherein said outline data includes a plurality of data points (captured image may be utilized to record reference points along the blade 32 such as the location of the key shoulder 30, the location of the tip of the blade 32, and the like, [0070], capture of an optical image of a profile or silhouette of the master key, including the key pattern of the master key, and the capture of a profile or silhouette of a key blank, [0040]). While the profile implies an outline composed of data points, another reference is provided to make this more clear.

Wills et al. teach said outline data includes a plurality of data points (electronic camera 28 receives the characteristics of the profile of the key, in particular, the length of the key and the

outline (e.g., head shape and blade) of the key. That is, the camera 28 views the profile or silhouette of the master key, [0087], At step 4210, the function ExtractSurfaceInformation() 4300 gets the outline of the key from the image by calling a function such as Profile(). At step 4220 the best fit centerline approximation of the key is found, [0240], "Get outline of key such as that obtained by the Profile() function; [4220] Find centerline of key using best fit straight line; [4230] Determine which edge of key is straightest; [4240] Set threshold = 250; [4260] while (centroid positions not found for at least 96% of the slices) [4250] Call FindCentroids()", [0244]). [centroids and pixels of profile interpreted as data points]

Bass et al. and Wills et al. are in the same art of key identification systems (Bass et al., abstract; Wills et al., abstract). The combination of Wills et al. with Bass et al. allows for identification of data points. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the data point finding of Wills et al., with the invention of Bass et al., as these identification techniques were well known at the time of the invention, incorporating the identification would have predictable results, and as Wills et al. indicate "The present invention, accordingly, saves man-hours and improves accuracy", [0008], "The present invention, however, does not require the master key to be precisely aligned to operate efficiently" ([0084]), which are advantages in a machine that will be used by customers or relatively untrained employees.

13. **Claim 50** is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Bass et al. (US 20070224008 A1) as applied to claim 40 above, further in view of Miyashita et al. (US 20040179190 A1).

Regarding claim 50, Bass et al. disclose the key duplication system of claim 40. Bass et al. do not disclose said plurality of data points is selectively adjustable along an interval to adjust accuracy of groove identification.

Miyashita et al. teach a plurality of data points is selectively adjustable along an interval to adjust accuracy of groove identification (the number of evaluation points can be increased, and the spacing in between the evaluation points can be narrowed, and as a result, the measurement accuracy of the optical properties measurement can be improved, [0051], a rectangular outer frame made up of an outline of the outer periphery of the predetermined area can be detected based on imaging data corresponding to the predetermined area, [0057]).

Bass et al. and Miyashita et al. are in the same art of key/wafer imaging and analysis systems (Bass et al., abstract; Miyashita et al., abstract). The combination of Miyashita et al. with Bass et al. allows for adjustment of data points. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the adjustment of Miyashita et al., with the invention of Bass et al., as these ways to increase accuracy were well known at the time of the invention, incorporating the adjustment would have predictable results, and as Miyashita et al. indicate the position of other divided areas can be calculated with substantial precision, and the state of the pattern image can be detected in a short period of time, which will have applications in a machine that is used on the spot by customers and therefore require fast processing.

14. **Claim 53** is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Bass et al. (US 20070224008 A1) as applied to claim 40 above, further in view of Campbell et al. (US 6839451 B2).

Regarding claim 53, Bass et al. disclose the key duplication system of claim 40. Bass et al. partly indicate a first image of said master key includes a groove in the bottom of a blade of said master key and wherein a second image of said master key includes a groove in the top of said blade of said master key (The optical imaging device 50 is generally positioned above the key 22 and 24 and directed downward such that a silhouette of the key 22 and 24, including the blade 32 of the key 22 and 24, may be captured, [0055], groove shown in Fig. 4B), but do not disclose this.

Cambell et al. teach a first image of said master key includes a groove in the bottom of a blade of said master key and wherein a second image of said master key includes a groove in the top of said blade of said master key ("As illustrated in FIGS. 6b, 7b, and 8b, blade 72 of master key also includes a first side 46 and a second side 47. Each side 46 and 47 typically includes millings 74, or grooves, that further define the key blank", col. 4, lines 45-55, "As further shown in FIG. 12, receiver 28 may be positioned proximate second surface 143 of reflecting device 140. From this position, receiver 28 may view support 142 through transparent second surface 143 of reflecting device 140. Thus, receiver 28 may capture an image of master key 32 along line 144. The captured image may be a back lit image, an illuminated surface image, or a combination of a back lit image and an illuminated surface image", col. 8, lines 45-60, "When the information about the key blank is loaded, a determination is made as to whether the key blank has unique milling patterns on both sides. If so, the indicator in the database is marked

accordingly. The control checks this indicator to determine if the key should be flipped to obtain additional information, col. 16, lines 5-15).

Bass et al. and Cambell et al. are in the same art of key identification systems (Bass et al., abstract; Cambell et al., abstract). The combination of Cambell et al. with Bass et al. allows for an image of the top and the bottom of a key. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the sides of Campbell et al., with the invention of Bass et al., as Campbell et al. indicate, "This allows the control to more easily identify shadows that are created by the milling grooves" (col. 15, lines 15-20) and "The present invention, therefore, provides a key identification system that is less complex and easier to use than conventional key identification systems. The system described herein uniformly illuminates the surface of the master key, without the interference of shadows or glares, and provides for an accurate identification of the key" (col. 16, lines 50-60) indicating the way the dual side imaging of Cambell et al. will lead to better key identification in conjunction with Bass et al.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHELLE M ENTEZARI HAUSMANN whose telephone number is (571)270-5084. The examiner can normally be reached on 10-7 M-F.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, VINCENT M RUDOLPH can be reached on (571)272-8243. 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 <https://ppair-my.uspto.gov/pair/PrivatePair>. 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.

/MICHELLE M ENTEZARI/
Primary Examiner, Art Unit 2661

Notice of References Cited	Application/Control No. 15/920,955		Applicant(s)/Patent Under Reexamination Thompson et al.	
	Examiner MICHELLE M ENTEZARI HAUSMANN		Art Unit 2661	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20070224008-A1	09-2007	Bass; Michael A.	G06K9/20	409/132
*	B	US-6065911-A	05-2000	Almblad; Robert	G05B19/4207	409/83
*	C	US-20040095380-A1	05-2004	Bass, Michael A.	G06F3/04842	715/738
*	D	US-20010033781-A1	10-2001	WILLS, PHILLIP R.	B23Q17/20	409/81
*	E	US-20040179190-A1	09-2004	Miyashita, Kazuyuki	G03F7/706	356/124
*	F	US-6839451-B2	01-2005	Campbell; John	B23C3/35	382/100
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	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	V	
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	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.

U.S. Patent and Trademark Office
PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 20210402a

<i>Index of Claims</i> 	Application/Control No. 15/920,955	Applicant(s)/Patent Under Reexamination Thompson et al.
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS										
☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47										
CLAIM		DATE								
Final	Original	12/21/2019	08/04/2020	04/05/2021						
	21	✓	✓	-						
	22	✓	✓	-						
	23	✓	✓	-						
	24	✓	✓	-						
	25	✓	✓	-						
	26	✓	✓	-						
	27	✓	✓	-						
	28	✓	✓	-						
	29	✓	✓	-						
	30	✓	✓	-						
	31	✓	✓	-						
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	54			✓						
	55			✓						
	56			✓						

<i>Search Notes</i> 	Application/Control No. 15/920,955	Applicant(s)/Patent Under Reexamination Thompson et al.
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661

CPC - Searched*		
Symbol	Date	Examiner
B23C2235/12, 41	12/17&12/19/2019	Entezari
B23C3/35	12/17&12/19/2019	Entezari
G06K9/00208, 2036, 209, 48, 6202	12/17&12/19/2019	Entezari
G06T2207/10141	12/17&12/19/2019	Entezari
G06T7/62	12/17&12/19/2019	Entezari
H04N5/247	12/17&12/19/2019	Entezari
Y10T409/300952, 301008, 301064	12/17&12/19/2019	Entezari

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
see EAST search, includes INV, IDS	12/17-12/21/2019	Entezari
see google scholar search	12/21/2019	Entezari
see ip.com search	12/21/2019	Entezari
see updated EAST search	08/04/2020	Entezari
see updated EAST search	4/2-4/4/2021	Entezari

<i>Search Notes</i> 	Application/Control No. 15/920,955	Applicant(s)/Patent Under Reexamination Thompson et al.
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S164	8	S163 and slot.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 15:30
S163	159	Thompson near2 Chester.inv. or Mutch near2 William.inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 15:30
S165	0	S163 and slot.clm. and angles.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2021/04/02 15:32
S166	7	S163 and angles.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2021/04/02 15:33
S167	100	(angles! or viewpoints! or perspectives! or points! view or (second or additional) adj2 (angle or viewpoint or view point or perspective)) and (slot or holder) same key and key blank and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 15:38
S168	11	(angles! or viewpoints! or perspectives! or points! view or (second or additional or different) adj2 (angle or viewpoint or view point or perspective)) with (camera or imag\$3 or captur\$3 or photograph) and key adj2 blank and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 15:50

S169	6	("20070224008" or "6588995" or "20020191849").pn. and blank	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 21:28
S171	6	S170 and groove contour.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 21:38
S170	159	Thompson near2 Chester.inv. or Mutch near2 William.inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 21:38
S175	30	S174 and (contour or boundary or boundaries or edge) with groove	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 21:47
S174	280	(S172 or S173) and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2021/04/02 21:47
S173	93	("5496138" "5497888" "5503785" "5515903" "5538374" "5543103" "5545367" "5552992" "5555176" "5556240" "5583443" "5592728" "5594652" "5607267" "5617323" "5630332" "5660509" "5671523" "5676504" "5677522" "5711643" "5739766" "5764156" "5771176" "5807042" "5855836" "5886775" "5906365" "5908273" "5926388" "5940229" "5964554" "5966457" "5982491" "5984597" "5997224" "5997795" "6053677" "6059495" "6064747" "6065911" "6082580" "6094953" "6152662" "6175638" "6179531" "6185311" "6186711"	US-PGPUB; USPAT	NEAR	OFF	2021/04/02 21:47

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S176	1	"20070224008".pn. and (gui or interface or monitor or touch screen)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 22:04
S177	4	S174 and outline with point	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 22:40
S179	51	S178 and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2021/04/02 22:41
S178	235	detect\$4 with key with outline	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 22:41
S181	27	S180 and key with outline and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 22:43
S180	69,072	((B23C2235/12 OR B23C2235/41 OR B23C3/35 OR G06K9/00208 OR G06K9/2036 OR G06K9/209 OR G06K9/48 OR G06K9/6202 OR G06T2207/10141 OR G06T7/62 OR H04N5/247 OR Y10T409/300952 OR Y10T409/301008 OR Y10T409/301064).CPC.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2021/04/02 22:43

S182	1	"20070224008".pn. and silhouette	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 22:46
S183	1	"20070224008".pn. and profile	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 22:48
S184	61	S180 and (self-serve or self service) with kiosk	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:00
S186	1	S185 and key with (cutting or duplication)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:01
S185	1,557	(self-serve or self service) with kiosk and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:01
S187	26	(self-serve or self service or kiosk) and key near2 (cutting or duplication or cutter) and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:08
S188	0	"20010033781".pn. and (adjustable or adjust\$3) with interval with accuracy	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:15

S189	7	S174 and (adjustable or adjust\$3) with (interval or accuracy)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:16
S190	1	S174 and (changing or change or changed or altering or alter or altered or alteration or adjusted or adjust or adjusting or increased or increase or increasing or decrease or decreased or decreasing or attenuate or attenuated or attenuating or attenuation or modify or modified or modifying or modification or tailor or tailored or tailoring or regulate or regulating or regulation or regulated or tune or tuning or tuned or tunable or revise or revised or revising or vary or varied or varying or transition or transitioned or transitioning or correct or corrected or correcting or correction or amend or amending or amended or amendment or adapt or adapted or adapting or adaptation or adaptive or tweak or tweaked or tweaking or modulate or modulated or modulation or modulating or morphed or morph or morphing or deform or deformed or deforming or deformation or lower or lowered or lowering or raise or raised or raising or mimic or mirror or mimicking or mirroring or enhance or enhanced or enhancing or exaggerate or exaggerated or exaggeration or exaggerating or emphasize or emphasized or emphasizing or changing or change or changed or altering or alter or altered or alteration or modify or modified or modifying or modification or tailor or tailored or tailoring or shift or shifting or shifted or vary or varied or varying or transition or transitioned or transitioning or moved or moving or synthetic or synthesized or synthesizing or editing or accentuate or accentuated or accentuating or transform or transforming or transformation or warp or warped or warping or stretch or stretching or amplified or amplify or	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:18

		amplifying or amplification or enlarge or enlarged or enlarging or exaggerate or exaggerated or exaggerating or exaggeration or emphasize or emphasized or emphasizing or magnify or magnified or magnifying or magnification) with (spaced or distance between or spacing or interval) same accuracy				
S191	0	S170 and accuracy with interval.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:20
S192	59,411	(changing or change or changed or altering or alter or altered or alteration or adjusted or adjust or adjusting or increased or increase or increasing or decrease or decreased or decreasing or modify or modified or modifying or modification or tailor or tailored or tailoring or tune or tuning or tuned or tunable or revise or revised or revising or amend or amending or amended or amendment or adapt or adapted or adapting or adaptation or adaptive or modulate or modulated or shift or shifting or shifted or vary or varied or varying) near3 (spaced or distance or spacing or interval or offset or displacement) same accuracy	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:23
S194	26	S192 and S180 and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:24
S193	4	S192 and key near2 (cutting or duplication or cutter or blank) and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:24
S195	0	key near2 (cutting or duplication or cutter or blank) and @ad<"20090501" and (outline or silhouette or profile) near3 (spaced or distance or spacing or	US-PGPUB; USPAT; USOCR; FPRS; EPO;	NEAR	ON	2021/04/02 23:26

		interval or offset or displacement) same accuracy	JPO; DERWENT; IBM_TDB			
S196	8	(changing or change or changed or altering or alter or altered or alteration or adjusted or adjust or adjusting or increased or increase or increasing or decrease or decreased or decreasing or modify or modified or modifying or modification or tailor or tailored or tailoring or tune or tuning or tuned or tunable or revise or revised or revising or amend or amending or amended or amendment or adapt or adapted or adapting or adaptation or adaptive or modulate or modulated or shift or shifting or shifted or vary or varied or varying) near3 (spaced or distance or spacing or interval or offset or displacement) with (profile or outline or data point or silhouette) and key near2 (cutting or duplication or cutter or blank) and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:27
S197	3	S174 and (changing or change or changed or altering or alter or altered or alteration or adjusted or adjust or adjusting or increased or increase or increasing or decrease or decreased or decreasing or modify or modified or modifying or modification or tailor or tailored or tailoring or tune or tuning or tuned or tunable or revise or revised or revising or amend or amending or amended or amendment or adapt or adapted or adapting or adaptation or adaptive or modulate or modulated or shift or shifting or shifted or vary or varied or varying) near3 (spaced or distance or spacing or interval or offset or displacement) same (profile or outline or data point or silhouette)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:28
S198	5	S174 and (changing or change or changed or altering or alter or altered or alteration or adjusted or adjust or adjusting or increased or increase or increasing or decrease or decreased or decreasing or attenuate or attenuated or attenuating or attenuation or modify or modified or modifying or modification or tailor or tailored or tailoring or regulate or regulating or	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:29

		regulation or regulated or tune or tuning or tuned or tunable or revise or revised or revising or vary or varied or varying or transition or transitioned or transitioning or correct or corrected or correcting or correction or amend or amending or amended or amendment or adapt or adapted or adapting or adaptation or adaptive or tweak or tweaked or tweaking or modulate or modulated or modulation or modulating or morphed or morph or morphing or deform or deformed or deforming or deformation or lower or lowered or lowering or raise or raised or raising or mimic or mirror or mimicking or mirroring or enhance or enhanced or enhancing or exaggerate or exaggerated or exaggeration or exaggerating or emphasize or emphasized or emphasizing or changing or change or changed or altering or alter or altered or alteration or modify or modified or modifying or modification or tailor or tailored or tailoring or shift or shifting or shifted or vary or varied or varying or transition or transitioned or transitioning or moved or moving or synthetic or synthesized or synthesizing or editing or accentuate or accentuated or accentuating or transform or transforming or transformation or warp or warped or warping or stretch or stretching or amplified or amplify or amplifying or amplification or enlarge or enlarged or enlarging or exaggerate or exaggerated or exaggerating or exaggeration or emphasize or emphasized or emphasizing or magnify or magnified or magnifying or magnification) with (point or pixel) same accuracy				
S199	133	(changing or change or changed or altering or alter or altered or alteration or adjusted or adjust or adjusting or increased or increase or increasing or decrease or decreased or decreasing or attenuate or attenuated or attenuating or attenuation or modify or modified or modifying or modification or tailor or tailored or tailoring or regulate or	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:37

		regulating or regulation or regulated or tune or tuning or tuned or tunable or revise or revised or revising or vary or varied or varying or transition or transitioned or transitioning or correct or corrected or correcting or correction or amend or amending or amended or amendment or adapt or adapted or adapting or adaptation or adaptive or tweak or tweaked or tweaking or modulate or modulated or modulation or modulating or morphed or morph or morphing or deform or deformed or deforming or deformation or lower or lowered or lowering or raise or raised or raising or mimic or mirror or mimicking or mirroring or enhance or enhanced or enhancing or exaggerate or exaggerated or exaggeration or exaggerating or emphasize or emphasized or emphasizing or changing or change or changed or altering or alter or altered or alteration or modify or modified or modifying or modification or tailor or tailored or tailoring or shift or shifting or shifted or vary or varied or varying or transition or transitioned or transitioning or moved or moving or synthetic or synthesized or synthesizing or editing or accentuate or accentuated or accentuating or transform or transforming or transformation or warp or warped or warping or stretch or stretching or amplified or amplify or amplifying or amplification or enlarge or enlarged or enlarging or exaggerate or exaggerated or exaggerating or exaggeration or emphasize or emphasized or emphasizing or magnify or magnified or magnifying or magnification) near3 (spaced or distance or spacing or interval or offset or displacement) with (point or pixel) with (accuracy or accurate) and (detect or detected or detecting or detection or key or extract or extracted or extracting or extraction) with (profile or outline or silhouette)				
S200	2	"20010033781".pn. and (accurate or accuracy)	US-PGPUB; USPAT; USOCR;	NEAR	ON	2021/04/02 23:41

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S201	50	S199 and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/02 23:42
S205	20	S204 and groove and (top or above) with imag\$3 same key	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2021/04/04 22:09
S204	280	(S202 or S203) and @ad<"20090501"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2021/04/04 22:09
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EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S209	10,255	(B23C2235/12 OR B23C2235/41 OR B23C3/35 OR G06K9/00208 OR G06K9/2036 OR G06K9/209 OR G06K9/48 OR G06K9/6202 OR G06T2207/10141 OR G06T7/62 OR H04N5/247 OR Y10T409/300952 OR Y10T409/301008 OR Y10T409/301064).CPC.)	USPAT	NEAR	OFF	2021/04/04 22:16
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S213	1	"6839451".pn. and second (side or surface)	USPAT	NEAR	ON	2021/04/04 22:19
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S214	1	"6839451".pn. and (other or both) (side or surface)	USPAT	NEAR	ON	2021/04/04 22:21
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4/5/2021 2:45:48 PM
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Electronic Patent Application Fee Transmittal				
Application Number:		15920955		
Filing Date:		14-Mar-2018		
Title of Invention:		KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING		
First Named Inventor/Applicant Name:		Chester O.D. Thompson		
Filer:		Mark Jason Masterson/Danielle Mueller		
Attorney Docket Number:		16223-00341		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 3 months with \$0 paid	2253	1	740	740
Miscellaneous:				
RCE- 1ST REQUEST	2801	1	680	680
Total in USD (\$)				1420

Electronic Acknowledgement Receipt	
EFS ID:	41896949
Application Number:	15920955
International Application Number:	
Confirmation Number:	2833
Title of Invention:	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING
First Named Inventor/Applicant Name:	Chester O.D. Thompson
Customer Number:	33772
Filer:	Mark Jason Masterson/Danielle Mueller
Filer Authorized By:	Mark Jason Masterson
Attorney Docket Number:	16223-00341
Receipt Date:	11-FEB-2021
Filing Date:	14-MAR-2018
Time Stamp:	09:00:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$1420
RAM confirmation Number	E20212A001043683
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Fee Worksheet (SB06)	fee-info.pdf	32676	no	2
			0c67ca16af7720f64e278846dd810a82cecd7cb1		
Warnings:					
Information:					
Total Files Size (in bytes):			32676		
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.					

Doc code: RCEX

Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (02-18)

Approved for use through 11/30/2020. 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.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL **(Submitted Only via EFS-Web)**

Application Number	15920955	Filing Date	2018-03-14	Docket Number (if applicable)	16223-00341	Art Unit	2661
First Named Inventor	Chester O. D. Thompson			Examiner Name	Michelle M. Hausmann		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.

Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☒ Amendment/Reply

☐ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____.
 (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(l) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 130265

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

Doc code: RCEX

Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (02-18)

Approved for use through 11/30/2020. 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.

Signature of Registered U.S. Patent Practitioner			
Signature	/Mark J. Masterson/	Date (YYYY-MM-DD)	2021-02-10
Name	Mark J. Masterson	Registration Number	71886

This collection of information is required by 37 CFR 1.114. 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 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.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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 records.
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 Patent Application Fee Transmittal				
Application Number:		15920955		
Filing Date:		14-Mar-2018		
Title of Invention:		KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING		
First Named Inventor/Applicant Name:		Chester O.D. Thompson		
Filer:		Mark Jason Masterson		
Attorney Docket Number:		16223-00341		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 3 months with \$0 paid	2253	1	740	740
Miscellaneous:				
RCE- 1ST REQUEST	2801	1	680	680
Total in USD (\$)				1420

Electronic Acknowledgement Receipt	
EFS ID:	41895128
Application Number:	15920955
International Application Number:	
Confirmation Number:	2833
Title of Invention:	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING
First Named Inventor/Applicant Name:	Chester O.D. Thompson
Customer Number:	33772
Filer:	Mark Jason Masterson
Filer Authorized By:	
Attorney Docket Number:	16223-00341
Receipt Date:	10-FEB-2021
Filing Date:	14-MAR-2018
Time Stamp:	19:04:31
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	Request for Continued Examination (RCE)	rce.pdf	133090	no	3
			4a73b346c3aaa0df1abb01d62ba199fa2c8783		

Warnings:

This is not a USPTO supplied RCE SB30 form.

Information:

2	Amendment Submitted/Entered with Filing of CPA/RCE	response.pdf	114772	no	7
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Warnings:

Information:

3	Fee Worksheet (SB06)	fee-info.pdf	32561	no	2
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Warnings:

Information:

Total Files Size (in bytes):			280423

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.

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application:	Chester O.D. Thompson	Group Art Unit:	2661
Serial No.:	15/920,955	Examiner:	Michelle M. Hausmann
Filing Date:	March 14, 2018	Docket No.:	16223-00341
		Confirmation No.:	2833

Title: KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

RESPONSE TO FINAL OFFICE ACTION

Applicant acknowledges receipt of the August 10, 2020 Final office action, setting a shortened statutory period of reply of three months. As this Response is being filed electronically on February 10, 2021, along with a three month extension, Request for Continued Examination and appropriate fees, applicant believes no additional fees are due. However, if any fees are required for filing this Response, please charge such fees to our Deposit Account No. 13-0265 identifying attorney docket number 16223-00341.

CLAIMS

What is claimed is:

1. 1-- 39. (Canceled)
40. (New) A key duplication system comprising:
 - a housing;
 - a key identification system comprising:
 - a slot opening in the housing configured to receive the blade of a master key;
 - an imaging system including one or more cameras configured to record images of the master key and at least one light source, wherein the imaging system is configured to use a single camera to capture multiple angles of the master key to determine groove characteristics of each side of the blade of the master key while the master key is maintained in the slot; and
 - a key cutting system configured to receive a key blank that the identification system has determined to be associated with the master key based on the groove characteristics of the master key and cut a key pattern of the master key into the key blank.
41. (New) The key duplication system of claim 40 wherein the groove characteristics include a groove contour.
42. (New) The key duplication system of claim 40 further comprising a user interface such as a monitor or a touch screen positioned on the housing.
43. (New) The key duplication system of claim 42 wherein the user interface is configured to provide an output to the user or operator to facilitate key duplication.
44. (New) The key duplication system of claim 41 wherein the user interface warns the user that a master key contains a computer chip.

45. (New) The key duplication system of claim 41 wherein the user interface instructs the user to place the master key in or near a device designed to sense the presence of a computer chip.
46. (New) The key duplication system of claim 45, wherein the system is configured as a self-serve kiosk.
47. (New) The key duplication system of claim 40, wherein the one or more light sources includes a backlight.
48. (New) The key duplication system of claim 40 wherein an image captured by the one or more cameras includes at least one backlight image.
49. (New) The key duplication system of claim 40, wherein said characteristics of said contour includes outline data wherein said outline data includes a plurality of data points.
50. (New) The key duplication system of claim 49, wherein said plurality of data points is selectively adjustable along an interval to adjust accuracy of groove identification.
51. (New) The key duplication system of claim 40 further comprising a key holder configured to hold said master key.
52. (New) The key duplication system of claim 51, wherein said key holder includes a clamp.
53. (New) The key duplication system of claim 40, wherein a first image of said master key includes a groove in the bottom of a blade of said master key and wherein a second image of said master key includes a groove in the top of said blade of said master key.
54. (New) The key duplication system of claim 40, wherein one of said views of said master key includes a view from an angle between perpendicular and parallel to the blade of said master key and not including perpendicular or parallel to the blade of said master key,
55. (New) The key duplication system of claim 40 wherein the system is configured to store data related to the master key and key duplicating event.

56. (New) The key duplication machine of claim 55, wherein the data is configured to be remotely communicated or downloaded for remote analysis.

REMARKS

Claims 21-39 are currently pending. The Non-Office Action identifies the following:

- Claims 21-39 have been subject to a claim interpretation under 35 USC 112(f)
- Claim 21 has been rejected under 35 USC 101 as being directed to an abstract idea.
- Claims 21, 22, 25-34, and 37 stand rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (U.S. Pub. No. 2002/0031251) in view of Addleman (WO8701194).
- Claim 23 is rejected under 35 U.S.C. 103 as being unpatentable over Campbell in view of Addleman and Barkman (U.S. Pat. No. 5,255,199).
- Claim 24 is rejected under 35 U.S.C. 103 as being unpatentable over Campbell in view of Adleman and Hillman (U.S. Pub. No. 2004/0013291).
- Claim 34 is rejected under 35 U.S.C. 103 as being unpatentable over Campbell in view of Addleman in view of Bass (US2007/0224008).
- Claim 35 is rejected under 35 U.S.C. 103 as being unpatentable over Campbell in view of Addleman and Wills (U.S. Pat. No. 6,064,747).
- Claim 36 is rejected under 35 U.S.C. 103 as being unpatentable over Campbell in view of Addleman and Gimelfarb (U.S. Pub. No. 2006/147289).
- Claim 38 is rejected under 35 U.S.C. 103 as being unpatentable over Campbell in view of Addleman and Gallarda (U.S. Pat. No. 6539106).
- Claim 39 is rejected under 35 U.S.C. 103 as being unpatentable over Campbell in view of Addleman and Satoh (U.S. Pub. No. 2009/0022369).

The following amendments and remarks address each of these issues and place the present application in condition for allowance. Notably, claims 21-39 are now canceled and claims 40-56 are newly added.

I. §112(f)

Claims 21-39 were identified as to be interpreted under 35 U.S.C. § 112(f) or (pre-AIA, sixth paragraph). Applicant respectfully submits that claims 21-39 have been canceled and that 112(f) or 112, sixth paragraph does not apply to the claim terms in new claims 40-56. For at least these reasons, Applicant respectfully submits that this objection be withdrawn.

II. §101 Rejections

Claims 21-39 stand rejected under 35 U.S.C. § 101 as allegedly directed to non-statutory subject matter. Applicant respectfully submits that claims 21-39 have been canceled and that §101 analysis does not apply to the claim terms in new claims 40-56. For at least these reasons, Applicant respectfully submits that this objection be withdrawn.

III. §103 Rejections

Claims 21-39 stand rejected as allegedly obvious over Campbell in view of Addleman as well as myriad other references. Claims 21 – 39 have been canceled and replaced with new claims 40-56. Applicant submits that the claim rejection in view of Campbell in view of Addleman and others does not sufficiently teach the subject matter of new claims 40-60.

More particularly, Campbell in view of Addleman fails to teach or otherwise disclose a key duplication system that includes a housing, a key identification system comprising a slot opening in the housing configured to receive the blade of a master key, an imaging system including one or more cameras configured to record images of the master key, at least one light wherein the imaging system is configured to use a single camera to capture multiple angles of the master key to determine groove characteristics of each side of the blade of the master key while the master key is maintained in the slot; and a key cutting system.

More particularly, Campbell and the remaining prior art of record does not disclose a housing with a slot to receive a blade for a master key. In contrast, Campbell includes a garage type enclosure for receiving an entire key therein to be placed on a surface. There is no teaching or suggestion by Campbell for disclosing a housing with a slot for receiving the blade of a master key and for imaging multiple angles of the master key while the master key is maintained in the slot.

Thus, for at least this reason, Campbell in combination with any of the cited prior art references fails to amount to a prima facie case of obviousness as the combined teachings of the cited art fail to teach each and every feature as recited by the independent claim 40. For at

least this reason, all remaining claims 40-56 are patentable over the cited references and are in condition for allowance.

CONCLUSION

In light of the foregoing, Applicants submits that the application is now in condition for acceptance. If the Examiner has any questions pertaining to the above, then the undersigned attorney would welcome a phone call to provide any further clarification or a formal interview.

Respectfully submitted,

Date: February 10, 2021

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 15/920,955		Filing Date 03/14/2018		☐ To be Mailed		
ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO										
APPLICATION AS FILED - PART I										
		(Column 1)	(Column 2)							
FOR		NUMBER FILED	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), (l), 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(j))		minus 20 =	*	x \$100 =						
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =	*	x \$460 =						
☐ 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										
		(Column 1)	(Column 2)	(Column 3)						
AMENDMENT	02/10/2021	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))	* 17	Minus	** 20	= 0	x \$100 =		0		
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0	x \$480 =		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)	(Column 2)	(Column 3)						
		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$0 =				
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =				
	☐ 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.					LIE					
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".					/MONICA D FRANCIS/					
*** 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.										

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.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/920,955	03/14/2018	Chester O.D. Thompson	16223-00341	2833
33772 7590 08/10/2020 MCDONALD HOPKINS LLC 600 Superior Avenue, East Suite 2100 CLEVELAND, OH 44114-2653			EXAMINER HAUSMANN, MICHELLE M	
			ART UNIT 2661	PAPER NUMBER
			NOTIFICATION DATE 08/10/2020	DELIVERY MODE ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipmailbox@mcdonaldhopkins.com

Office Action Summary	Application No. 15/920,955	Applicant(s) Thompson et al.	
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661	AIA (FITF) 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 MONTHS 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 6/30/2020.
☐ 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) 21-39 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) 21-39 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 ____ 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.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
 Paper No(s)/Mail Date ____.
- 3) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date ____.
- 4) ☐ Other: ____.

DETAILED ACTION

Response to Amendment

1. Claims 21-39 are pending. Claims 21-39 are amended directly or by dependency on an amended claim.

Response to Arguments

2. Applicant's arguments filed June 30, 2020 have been fully considered but they are not persuasive.
3. With respect to the arguments, see pages 5-6, with respect to the 35 USC 112 6th/f interpretations of claims 21-39, examiner maintains that "system comprising" and "logic configured to" convey functions without accompanying sufficient structure. Examiner recommends amending the language to "a system comprising a processor" or other similar language conveying a specific structure.
4. With respect to the arguments, see pages 7-8, with respect to the 35 USC 101 rejections of claims 21-39, along with accompanying amendments received on the same date incorporating further physical structures, are not considered sufficient to distinguish from a mental process. Examiner recommends amending the language to include using the match to take some action, such as selecting an appropriate key blank or some other concrete action.
5. Applicant's arguments on pages 8-9 with respect to the 35 USC 103 rejections of claims 21-39 along with accompanying amendments received on the same date have been considered but are moot because the arguments do not apply to the current combination of references being used in the current rejection.
6. All other arguments are by similarity or dependency and are addressed by the above.

Claim Interpretation

7. The following is a quotation of 35 U.S.C. 112(f):

(f) Element in Claim for a Combination. – An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

The following is a quotation of pre-AIA 35 U.S.C. 112, sixth paragraph:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

8. This application includes one or more claim limitations that do not use the word “means,” but are nonetheless being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, because the claim limitation(s) uses a generic placeholder that is coupled with functional language without reciting sufficient structure to perform the recited function and the generic placeholder is not preceded by a structural modifier. Such claim limitation(s) is/are: “key identification system comprising” and “a logic configured to map data points” **in claim 21 (and by dependency, claims 22-39).**

Because this/these claim limitation(s) is/are being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, it/they is/are being interpreted to cover the corresponding structure described in the specification as performing the claimed function, and equivalents thereof.

If applicant does not intend to have this/these limitation(s) interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, applicant may: (1) amend the claim limitation(s) to avoid it/them being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112,

sixth paragraph (e.g., by reciting sufficient structure to perform the claimed function); or (2) present a sufficient showing that the claim limitation(s) recite(s) sufficient structure to perform the claimed function so as to avoid it/them being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph.

NOTE ON 101: If the applicant amends to no longer be interpreted under 35 USC 112 f/6th, the logic of claim 21 likely becomes **pure software**, so any amendments should take into consideration the potential 35 USC 101 rejections for lacking a non-transitory CRM in future claim language as well.

Claim Rejections - 35 USC § 101

9. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. **Claim 21 (and by dependency claims 22-39)** are rejected under 35 U.S.C. 101 because the claimed invention is directed to an abstract idea without significantly more. The claim recites: a key identification system comprising... a logic configured to map data points from said first image to corresponding data, points from said second image to determine characteristics of a contour of said master key; and wherein said logic compares said characteristics of said contour with characteristics of known key blanks to determine the likelihood of a match between said master key and a known key blank. If a claim limitation, under its broadest reasonable interpretation, covers performance of the limitation in the mind but for the recitation of generic computer components, then it falls within the "Mental Processes" grouping of abstract ideas. Accordingly, these limitations fall under the mental processes category and are stated at a high level of generality, and recite an abstract idea. This judicial exception is not integrated into a practical application.

Examiner recommends indicating what the key identification system does with the information regarding the likelihood of a match for instance, in order to integrate the concept into a practical application.

Claim Rejections - 35 USC § 103

11. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

12. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

13. **Claims 21, 22, 25-34, and 37** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1) in view of Addleman et al. (WO8701194).

Regarding claim 21, Campbell et al. disclose a key identification system comprising: an imaging system including a first camera wherein said imaging system is configured to capture a first image of a master key and a second image of said master key, said first image different than said second image ("Preferably, second receiver 50 is positioned such that the viewing range 54 of the second receiver 50 overlaps viewing range 42 of receiver 28. Thus, receiver 28 will capture an image of a first part of master key 32 and second receiver 50 will

capture and image of a second part of the master key", [0053]); a logic configured to map data, points from said first image to corresponding data, points from said second image to determine characteristics of a contour of said master key (images captured by receiver 28 and second receiver 50 can be combined to create a complete image of the master key, [0053], first luminous surface 24 includes reference marks 55 to aid in combining the images of the key captured by receiver 28 and second receiver 50, reference marks 55 are used when the two separate images are combined to form a single image of the master key and ensure that the image of the key is properly combined, [0054], edge map of the master key, edge map is an array of points that define the relative locations of different points along the edges of the master key, [0077]); and wherein said logic compares said characteristics of said contour with characteristics of known key blanks to determine the likelihood of a match between said master key and a known key blank (comparing information about the head, shoulder, and blade of the master key to similar information about known key blanks, the key blank corresponding to the master key may be identified, [0038], searches the known key blanks in the database to filter out key blanks that have different numbers of cut edges and have blade lengths that are outside a certain tolerance of the blade length of the master key, subset of potential matches, [0084], "If the shape comparison based on the shape description string fails to produce a score indicative of a match, the control may perform a comparison based on the contour description string for the master key and potential key blank matches. It is contemplated that the contour description matching described below may be performed prior to or instead of the shape description string matching. The contour description matching may be a "pass or fail" type matching process. If the contour description matching process yields a "passing" score, the corresponding key blank is added to the list of possible matches", [0089], contour matching

score, aid in identifying the appropriate key blank, [0093]-[0095], [0097], score values over a specific threshold are considered to be matched shapes, [0100]).

Campbell et al. do not use the exact language "likelihood of a match". It would have been obvious at the time of the invention to one of ordinary skill in the art that the score described by Campbell et al. can encompass a likelihood, as a score is one way to convey a likelihood.

Campbell et al. do not disclose at least one mirror wherein the at least one mirror allows said first camera at a remote position from said master key to capture images from multiple angles of said master key.

Addleman et al. teach at least one mirror wherein the at least one mirror allows said first camera at a remote position from said master key to capture images from multiple angles of said master key (non-contact surface sensing and digitizing, abstract, "The contour line generated by the intersection of the light plane and the subject surface is viewed from a small angle away from the light plane by mirrors 40 and 42. The path of light 41 from point 50 on the contour line is reflected from mirror 40, passes through the beamsplitter 44 to the sensor 48. A second light path 43 from the same point 58 is reflected by mirror 42 and the surface of beamsplitter 44 to the sensor 48. The combined images follow light path 45", p6, Fig. 6, more than two viewing directions can be combined by iteration of either preferred embodiment, p6).

Campbell et al. and Addleman et al. are in the same art of light projection and object imaging and digitizing (Campbell et al., abstract, [0007], [0047]; Addleman et al., abstract). The addition of Gimelfarb would incorporate mirrors into the imaging process. It would have been obvious at

the time of the invention to one of ordinary skill in the art to combine the mirrors of Addleman et al. with the invention of Campbell et al., as this was known at the time of the invention, the combination would have predictable results, and as Addleman et al. indicate, "The invention is significant because of the speed and relative simplicity of the method and a provision for alleviating shadowing from large surface irregularities and its accommodation of a wide deviance range of light reflection. The apparatus has no moving parts" (abstract) indicating the speed and apparatus efficiency of Campbell et al. can be increased by incorporation of Addleman et al.

Regarding claim 22, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. further disclose characteristics of said contour includes outline data wherein said outline data includes a plurality of data points ("The control then analyzes the silhouette image of the key to create an edge map of the master key (step 110). The edge map is an array of points that define the relative locations of different points along the edges of the master key", [0077]).

Regarding claim 25, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. further disclose said logic includes a database containing data related to characteristics of grooves of known key blanks (searches the known key blanks in the database to filter out key blanks that have different numbers of cut edges, [0084], control compares each mill shape descriptor of the master key to the mill shape descriptor of the known key blanks and scores the comparison, [0100], whether the key blank has unique milling patterns on both sides, the indicator in the database is marked accordingly, [0107]).

Regarding claim 26, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. further disclose said logic is configured to generate tolerance and or correlation values to determine the likelihood that the comparison yields a match (comparing information about the head, shoulder, and blade of the master key to similar information about known key blanks, the key blank corresponding to the master key may be identified, [0038], tolerance of the blade length of the master key, comparison, [0084], [0087], the similarity of each comparison is assigned a score, [0088], score indicative of a match, the control may perform a comparison based on the contour description string for the master key and potential key blank matches, [0089], contour match sum is compared to an ideal match score, [0094], employ a ranking system to identify the key blanks that are most similar to one another, [0096], matching type section having a size that is between the first tolerance level and a second tolerance level is given a partial score, [0104]).

Regarding claim 27, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. further disclose said first image is a digital image (receiver is a high resolution digital camera, [0047], control analyzes the pixels of this image of the master key to identify the milling exit shape, [0098]).

Regarding claim 28, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. further disclose said second image comprises a silhouette of a blade of said master key (profile of the master key reveals the shape and size of the head and shoulder of the master key, as well as the length of the key blade, [0044]).

Regarding claim 29, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. further disclose said second image comprises a silhouette of a tip of said master key (outline the profile of the master key, [0044], control then analyzes the silhouette image of the key to create an edge map of the master key, [0077], extreme points represent the tip 62 and the head 64 of the key, [0078], establishes the tip end of the spine by searching the edge map of the key, [0080]).

Regarding claim 30, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. further disclose said characteristics of said contour are determined based on image data from at least said two or more views of said master key (images captured by receiver 28 and second receiver 50 can be combined to create a complete image of the master key, [0053], first luminous surface 24 includes reference marks 55 to aid in combining the images of the key captured by receiver 28 and second receiver 50, reference marks 55 are used when the two separate images are combined to form a single image of the master key and ensure that the image of the key is properly combined, [0054], edge map of the master key, edge map is an array of points that define the relative locations of different points along the edges of the master key, [0077]).

Regarding claim 31, Campbell et al. and Addleman et al. disclose the key identification system of claim 30. Campbell et al. further disclose said logic calculates the geometry of the contour as though a tip of said master key were squarely cut based on data from at least said two or more views of said master key (size and shape of key head 64 and shoulder area 70 are features of the master key 32 that are useful in identifying the corresponding key blank, [0035], head shape, [0065], width descriptions are combined into a single shape description string,

[0085], contour information is derived from the shape of the outer perimeter of head, [0086] shape description string matching, [0089], [0098], [0104]).

Regarding claim 32, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. further disclose a key holder configured to hold said master key (master key 32 may be placed directly on first luminous surface 24 or a transparent support, [0044]).

Regarding claim 33, Campbell et al. and Addleman et al. disclose the key identification system of claim 32. Campbell et al. further disclose in the prior art said key holder includes a clamp (master key may be positioned in a clamp and a cutting mechanism, [0004]). It would have been obvious at the time of filing to one of ordinary skill in the art to use a clamp as described in the prior art embodiments, as this is one of a limited number of ways to secure a key.

Regarding claim 37, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. further disclose said logic includes a tolerance range for each characteristic of said master key to determine whether a master key passes or fails to match a known key blank ([0087], [0104]).

14. **Claim 23** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1) and Addleman et al. (WO8701194) as applied to claim 22 above, further in view of Barkman et al. (IDS: US 5255199 A).

Regarding claim 23, Campbell et al. and Addleman et al. disclose the key identification system of claim 22. Campbell et al. and Addleman et al. do not explicitly disclose said plurality of data points is selectively adjustable along an interval to adjust accuracy of groove identification.

Barkman et al. teach a plurality of data points is selectively adjustable along an interval to adjust accuracy of groove identification (removing inaccurate edge point data from the collected data points relating to the cutting tool edge, remove these inaccurate tangent edge points to increase the accuracy of measurement calculations subsequently performed, col. 6, lines 30-50).

Campbell et al. and Barkman et al. are in the same art of edge inspection (Campbell et al., [0051]; Barkman et al., abstract). The combination of Barkman et al. with Campbell et al. and Addleman et al. will enable the change in the number of data points used. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the point number adjustment of Barkman et al. with the invention of Campbell et al. and Addleman et al. as this was known at the time of filing, the combination would have predictable results, and as Barkman et al. indicate this will increase accuracy (col. 6, lines 30-50), and better identifying an edge will be an advantage when determining a number of bittings to determine a correct blank in the invention of Campbell et al.

15. **Claim 24** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1) and Addleman et al. (WO8701194) as applied to claim 21 above, further in view of Hillman et al. (US 20040013291 A1).

Regarding claim 24, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. and Addleman et al. do not explicitly disclose said imaging system further comprises a crop box for limiting the image of the master key, wherein said crop box defines the outer periphery of at least said first and second images of said master key.

Hillman et al. teach a crop box for limiting the image of the object of interest, wherein said crop box defines the outer periphery of at least said first and second images of said object of interest (extracting the edges of the scan, pinpointing reference points on it, positioning, standardizing, and aligning it; autocropping, extracting a plurality of features and/or regions within the scan; correlating said regions or features with database images and parameters, abstract, pinpointing of reference points is done by use of a matching template images, [0030], matching template images of the brain to database images of brains, include specific 2-D slices, [0045], identifying and aligning the image brain scan using template matching then by use of further template matching, a point on the object is chosen as a reference point, [0064], "Parameters necessary for cropping the relevant digital feature images are optimized; the digital feature images are cropped based on the optimized cropping parameters for selecting profile and relevant feature for further analysis", [0065]).

Campbell et al. and Hillman et al. are in the same art of matching image features to a template (Campbell et al., [0097]; Hillman et al., [0045]). The combination of Hillman et al. with Campbell et al. and Addleman et al. will enable the use of a crop box. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the crop box of Hillman et al. with the invention of Campbell et al. as this was known at the time of filing, the

combination would have predictable results, and as this will minimize analysis of extraneous information, which will improve efficiency in making comparisons to key blanks in a database as described in the invention described by Campbell et al.

16. **Claim 34** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1) and Addleman et al. (WO8701194) as applied to claim 21 above, further in view of Bass et al. (IDS: US 20070224008 A1).

Regarding claim 34, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. partly disclose said first image of the master key includes a groove in the bottom of a blade of said master key and wherein said second image of the mater key includes a groove at the top of said master key (see receiver 28 in Fig. 1, Fig. 2), however, does not make this explicit.

Bass et al. teach a first image of the master key includes a groove in the bottom of a blade of said master key and wherein said second image of the mater key includes a groove at the top of said master key ("Such analysis may include quantifying and defining the depth, angle, and position of each tooth in the key pattern 36; determining whether there is a key pattern 36 on one side of the key 22 (a single-sided key) or on both sides of the key 22 (a double-sided key); determining precisely where along the blade 32 the key pattern 36 begins and ends; and the like. In addition, surface features of the blade 32, such as the presence, length, and width of a key groove 34, may be determined", [0060], "It should be clear that such a scan could read one or both sides of a key 22. Information on the groove 34 may likewise be analyzed and

compared by the logic to groove information stored in the database related to known key blanks 24", [0063]).

Cambell et al. and Bass et al. are in the same art of copying keys (Cambell et al., abstract; Bass, abstract). The addition of Bass would determine if there is a double sided key. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the analysis of Bass with the invention of Cambell et al. and Addleman et al., as this was known at the time of the invention, would have predictable results, and as one of a limited number of key descriptors, would have been obvious to try, and as Bass et al. indicate this will, "produce accurate and reliable duplicates of master keys... the captured images may be analyzed by logic to determine the proper key blank to be used for a duplicate key, validate the selection of the proper key blank, facilitate the accurate cutting of the key pattern of the master key into the key blank, and validate the accuracy of the key pattern cut into the key blank" ([0040]), which will have advantages when incorporated into the key duplication strategy of Campbell et al.

17. **Claim 35** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1) and Addleman et al. (WO8701194) as applied to claim 21 above, further in view of Wills et al. (IDS: US 6064747 A).

Regarding claim 35, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. and Addleman et al. do not explicitly disclose one of said views of said master key includes a view from an angle between perpendicular and parallel to the blade of said master key and not including perpendicular or parallel to the blade of said master key.

Wills et al. teach one of said views of said master key includes a view from an angle between perpendicular and parallel to the blade of said master key and not including perpendicular or parallel to the blade of said master key (angle of the surface of the key relative to the light beam LB and camera 28 at the point of intersection also affects the intensity incident upon the camera, col. 13, lines 20-50, Fig. 6).

Campbell et al. and Wills et al. are in the same art of key inspection (Campbell et al., abstract; Wills et al., abstract). The combination of Wills et al. with Campbell et al. and Addleman et al. will enable the use of a particular view angle. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the angle of Wills et al. with the invention of Campbell et al. and Addleman et al. as this was known at the time of filing, the combination would have predictable results, and as it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges (such as the best viewing angle) involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

18. **Claim 36** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1) and Addleman et al. (WO8701194) as applied to claim 21 above, further in view of Gimelfarb et al. (US 20060147289 A1).

Regarding claim 36, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. and Addleman et al. do not explicitly disclose the logic is configured to shift data related to said characteristics of said contour to compare with said known key blank characteristics.

Gimelfarb et al. teach the logic is configured to shift data related to said characteristics of said contour to compare with said known key blank characteristics (bittings aligned to master key, slidable along axis, abstract, [0014], [0030], [0035]).

Cambell et al. and Gimelfarb are in the same art of copying keys (Cambell et al., abstract; Gimelfarb, abstract). The addition of Gimelfarb would add a slidable alignment method. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the sliding alignment of Gimelfarb with the invention of Campbell et al., as this was known at the time of the invention, the combination would have predictable results, and as this allows for more easy key positioning and comparison.

19. **Claim 38** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1) and Addleman et al. (WO8701194) as applied to claim 21 above, further in view of Gallarda et al. (US 6539106 B1).

Regarding claim 38, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. and Addleman et al. do not explicitly disclose said logic is configured to generate a series of comparisons to compensate for registration errors.

Gallarda et al. teach logic is configured to generate a series of comparisons to compensate for registration errors ("The features are stored or represented as data structures, e.g. linked lists, that do not necessarily list the features in the same order in the list for the test image as in the list for the reference image. (Feature extraction order may vary depending on a variety of

factors, including the relative stage position error.) Features of the test and reference images thus cannot be matched by overlaying the data structure. Matching is therefore based on the physical location (e.g. x, y coordinate location) of the feature, corrected as needed for image alignment offset (e.g., using the result of an image alignment algorithm). Matching takes into account features which are missing in an image, whether because they are outside the field of view (e.g., due to stage errors) or due to wafer processing errors (i.e., defects)", col. 16, lines 50-68).

Campbell et al. and Gallarda et al. are in the same art of matching image features to a template (Campbell et al., [0097]; Gallarda et al., col. 3, lines 20-55). The combination of Gallarda et al. with Campbell et al. and Addleman et al. will enable the compensation of registration errors. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the correction of Gallarda et al. with the invention of Campbell et al. and Addleman et al. as this was known at the time of filing, the combination would have predictable results, and as Gallarda et al. indicate "Alignment of reference and test images or image regions does not require pixel accuracy. Image alignment need only be close enough so that corresponding features between images or image regions will be correctly matched" (col. 5, line 60 – col. 6, line 5), which is beneficial when matching between a master key and key blank templates when the image of Campbell et al. is likely to not be completely perfect and some leeway will be required to perform a registration.

20. **Claim 39** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1) and Addleman et al. (WO8701194) as applied to claim 21 above, further in view of Satoh et al. (US 20090022369 A1).

Regarding claim 39, Campbell et al. and Addleman et al. disclose the key identification system of claim 21. Campbell et al. and Addleman et al. do not explicitly disclose said logic includes at least one roll constant used to adjust the plurality of data, points to increase accuracy of a match with a known key blank.

Satoh et al. teach logic includes at least one roll constant used to adjust the plurality of data, points to increase accuracy of a match with a template ("the position/orientation calculation unit 1720 calculates a correction matrix ΔR_{WC_1} used to apply correction to three parameters (pan, tilt, and roll angles) of the orientation measurement value of the image capture device 130, so as to cancel errors on the detected indices", [0241], [0244]; template matching, [0063], [0288]). [Campbell et al. teach matching known key blanks in a database]

Campbell et al. and Satoh et al. are in the same art of imaging a target object (Campbell et al., abstract; Satoh et al., [0023]). The combination of Satoh et al. with Campbell et al. and Addleman et al. will enable the compensation of roll. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the roll correction of Satoh et al. with the invention of Campbell et al. and Addleman et al. as this was known at the time of filing, the combination would have predictable results, and as Satoh et al. indicate "The present invention has been made in consideration of the problems of such prior arts, and has as its object to provide a position/orientation measurement method and apparatus, which can measure the position and orientation of a measurement target object while simultaneously achieving high stability and high precision" ([0023]), which will be beneficial as there will inevitably be some imaging error in the system of Campbell et al. that would benefit from correction.

Conclusion

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHELLE M ENTEZARI HAUSMANN whose telephone number is (571)270-5084. The examiner can normally be reached on 10-7 M-F.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, VINCENT M RUDOLPH can be reached on (571)272-8243. 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 <https://ppair-my.uspto.gov/pair/PrivatePair>. 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.

/MICHELLE M ENTEZARI/
Primary Examiner, Art Unit 2661

<i>Notice of References Cited</i>	Application/Control No. 15/920,955		Applicant(s)/Patent Under Reexamination Thompson et al.	
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U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
	A					
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N	WO-8701194-A1	02-1987	WO	ADDLEMAN LLOYD ANDREW	G01B11/2518
	O					
	P					
	Q					
	R					
	S					
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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.

U.S. Patent and Trademark Office
PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 20200804

<i>Search Notes</i> 	Application/Control No. 15/920,955	Applicant(s)/Patent Under Reexamination Thompson et al.
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661

CPC - Searched*		
Symbol	Date	Examiner
B23C2235/12, 41	12/17&12/19/2019	Entezari
B23C3/35	12/17&12/19/2019	Entezari
G06K9/00208, 2036, 209, 48, 6202	12/17&12/19/2019	Entezari
G06T2207/10141	12/17&12/19/2019	Entezari
G06T7/62	12/17&12/19/2019	Entezari
H04N5/247	12/17&12/19/2019	Entezari
Y10T409/300952, 301008, 301064	12/17&12/19/2019	Entezari

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
see EAST search, includes INV, IDS	12/17-12/21/2019	Entezari
see google scholar search	12/21/2019	Entezari
see ip.com search	12/21/2019	Entezari
see updated EAST search	08/04/2020	Entezari

<i>Search Notes</i> 	Application/Control No. 15/920,955	Applicant(s)/Patent Under Reexamination Thompson et al.
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Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

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✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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CLAIMS									
☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47									
CLAIM		DATE							
Final	Original	12/21/2019	08/04/2020						
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	38	✓	✓						
	39	✓	✓						

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
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S139	41	S138 and (mirror or reflective surface) same (views! or perspectives! or angles!)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2020/08/04 11:13
S138	461	S137 and key (shape or scan or scanned or scanner or scanning)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2020/08/04 11:13
S140	227	S137 and key near2 (groove or biting)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2020/08/04 11:15
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S143	86	(mirror or reflective surface) same (views! or perspectives! or angles!) and key near2 (groove or biting)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2020/08/04 11:24
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EAST Search History (Interference)

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8/4/2020 11:05:49 PM

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application:	Chester O.D. Thompson	Group Art Unit:	2665
Serial No.:	15/920,955	Examiner:	Michelle M. Hausmann
Filing Date:	March 14, 2018	Docket No.:	16223-00341
		Confirmation No.:	2833

Title: KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

RESPONSE TO OFFICE ACTION

Applicant acknowledges receipt of the December 30, 2019 non-final office action, setting a shortened statutory period of reply of three months. As this Response is being filed electronically on June 30, 2020, along with a three month extension, applicant believes no additional fees are due. However, if any fees are required for filing this Response, please charge such fees to our Deposit Account No. 13-0265 identifying attorney docket number 16223-00341.

CLAIMS

What is claimed is:

1. 1-- 20. (Canceled)

21. (Currently Amended) A key identification system comprising:

an imaging system including a first camera and at least one mirror wherein said imaging system is configured to capture a first image of a master key and ~~a second camera configured to capture~~ a second image of said master key, wherein the at least one mirror allows said first camera at a remote position from said master key to capture images from multiple angles of said master key, wherein said first image is different than said second image;

a logic configured to map data points from said first image to corresponding data points from said second image to determine characteristics of a contour of said master key; and

wherein said logic compares said characteristics of said contour with characteristics of known key blanks to determine the likelihood of a match between said master key and a known key blank.

22. (Previously Presented) The key identification system of claim 21, wherein said characteristics of said contour includes outline data wherein said outline data includes a plurality of data points.

23. (Previously Presented) The key identification system of claim 22, wherein said plurality of data points is selectively adjustable along an interval to adjust accuracy of groove identification.

24. (Previously Presented) The key identification system of claim 21, wherein said imaging system further comprises a crop box for limiting the image of the master key,

wherein said crop box defines the outer periphery of at least said first and second images of said master key.

25. (Previously Presented) The key identification system of claim 21, wherein said logic includes a database containing data related to characteristics of grooves of known key blanks.

26. (Previously Presented) The key identification system of claim 21 wherein said logic is configured to generate tolerance and/or correlation values to determine the likelihood that the comparison yields a match.

27. (Previously Presented) The key identification system of claim 21, wherein said first image is a digital image.

28. (Previously Presented) The key identification system of claim 21, wherein said second image comprises a silhouette of a blade of said master key.

29. (Previously Presented) The key identification system of claim 21 wherein said second image comprises a silhouette of a tip of said master key.

30. (Previously Presented) The key identification system of claim 21, wherein said characteristics of said contour are determined based on image data from at least said two or more views of said master key.

31. (Previously Presented) The key identification system of claim 30, wherein said logic calculates the geometry of the contour as though a tip of said master key were squarely cut based on data from at least said two or more views of said master key.

32. (Previously Presented) The key identification system of claim 21 further comprising a key holder configured to hold said master key.

33. (Previously Presented) The key identification system of claim 32, wherein said key holder includes a clamp.

34. (Currently Amended) The key identification system of claim 21, wherein ~~one of said views~~ said first image of said master key includes ~~a view from above the master key blade of~~

a groove in the bottom of a blade of said master key ~~said blade~~ and wherein said second image of said master key includes a groove in the top of said blade of said master key.

35. (Previously Presented) The key identification system of claim 21, wherein one of said views of said master key includes a view from an angle between perpendicular and parallel to the blade of said master key and not including perpendicular or parallel to the blade of said master key,

36. (Previously Presented) The key identification system of claim 21, wherein the logic is configured to shift data related to said characteristics of said contour to compare with said known key blank characteristics.

37. (Previously Presented) The key identification system of claim 21, wherein said logic includes a tolerance range for each characteristic of said master key to determine whether a master key passes or fails to match a known key blank.

38. (Previously Presented) The key identification system of claim 21, wherein said logic is configured to generate a series of comparisons to compensate for registration errors.

39. (Currently Amended) The key identification system of claim 21, wherein said logic includes at least one roll constant used to adjust the plurality of data points to increase accuracy of a match with a known key blank.

REMARKS

Claims 21-39 are currently pending. The Non-Office Action identifies the following:

- Claims 21-39 have been subject to a claim interpretation under 35 USC 112(f)
- Claim 21 has been rejected under 35 USC 101 as being directed to an abstract idea.
- Claims 21, 22, 25-34, and 37 stand rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (U.S. Pub. No. 2002/0031251).
- Claim 23 is rejected under 35 U.S.C. 103 as being unpatentable over Campbell in view of Barkman (U.S. Pat. No. 5,255,199).
- Claim 24 is rejected under 35 U.S.C. 103 as being unpatentable over Campbell in view of Hillman (U.S. Pub. No. 2004/0013291).
- Claim 35 is rejected under 35 U.S.C. 103 as being unpatentable over Campbell in view of Wills (U.S. Pat. No. 6,064,747).
- Claim 36 is rejected under 35 U.S.C. 103 as being unpatentable over Campbell in view of Gimelfarb (U.S. Pub. No. 2006/-147289).

The following amendments and remarks address each of these issues and place the present application in condition for allowance.

I. §112(f)

Claims 21-39 were identified as to be interpreted under 35 U.S.C. § 112(f) or (pre-AIA, sixth paragraph). Applicant respectfully submits that 112(f) or 112, sixth paragraph does not apply to the claim terms “key identification system comprising” and “a logic configured to map data points” because they are not generic place holders and do describe sufficient structure.

The Federal Circuit has repeatedly held that if the claim term “actually uses the word ‘means,’” it is presumed to be a means plus claim, if the claim term “does not use ‘means,’” it is presumed not to be. *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1358 (Fed. Cir. 2004) (quoting *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1369 (Fed. Cir. 2002)). “[T]he presumption flowing from the absence of the term ‘means’ **is a strong one that is not readily overcome.**” *Inventio AG v. ThyssenKrupp Elevator Americas Corp.*,

649 F.3d 1350, 1356 (Fed. Cir. 2011) (emphasis added); *but see Williamson v. Citrix Online, LLC*, No. 2013-1130 (Fed. Cir. June 16, 2015) (en banc) (presumption is a preponderance of the evidence).

If a claim does not recite “means,” like the current claims, they may still be means-plus-function if “the claim term fails to recite sufficiently definite structure or else recites function without reciting sufficient structure for performing that function.” *Flo Healthcare Solutions, LLC v. Kappos*, 697 F.3d 1367, 1373 (Fed. Cir. 2012). Lack of structure may only be shown when “the limitation essentially is devoid of anything that can be construed as structure,” by someone of skill in the art. *Id.* at 1374.

Further, if a term does invoke § 112, the Office Action must identify it for the scope of the term. (*See Supplementary Examination Guidelines for Determining Compliance with 35 U.S.C. § 112 and for Treatment of Related Issues in Patent Applications*, 76 FR 7162 (Feb. 9, 2011), at slide 36, *see also* Office Action at page 2.

Here, the claim terms “key identification system comprising” and “a logic configured to map data points” clearly do not use the word “means.” Moreover, neither the MPEP nor the Office Action identify any instance in which the terms “key identification system comprising” and “a logic configured to map data points” have ever been interpreted as “generic placeholders.” Thus, the Office Action has set forth no basis for overcoming the presumption. Moreover, neither the MPEP or the Office Action identify any instance in which the terms “key identification system comprising” and “a logic configured to map data points” have ever been interpreted as “generic placeholders.”

For at least these reasons, Applicant respectfully submits that the claim terms “key identification system comprising” and “a logic configured to map data points” do not invoke § 112, (f) or ¶ 6. And Applicant requests indication of such.

II. §101 Rejections

Claims 21-39 stand rejected under 35 U.S.C. § 101 as allegedly directed to non-statutory subject matter. More particularly, the Office Action alleges that the claims are directed towards the an abstract idea that covers performance of the limitation in the mind and falls under the “Mental Processes” grouping of abstract ideas. Applicant has amended independent claim 21 above to clarify the recited features and submits that these claims, and claims dependent therefrom, are patent eligible under § 101 at least because they are eligible for streamlined analysis.

Eligibility analysis under *Alice* uses a two prong test, determining: (1) whether the claim is directed to patent-ineligible concepts – (e.g., an abstract idea, law of nature, natural phenomenon, or law of mathematics.); and, if so, (2) whether the claims recite something more – “determine whether there is an ‘inventive concept’ that” amounts to something more. *Cal. Institute of Tech. v. Hughes Commcn's Inc.*, 2104 U.S. Dist. Lexis 156763, *9 (C.D. Cal. Nov. 3, 2014) citing *Alice*, 134 S. Ct. at 2355). Recitation of “generic computer, network, and Internet components,” may not amount to something more, unless “ordered combination of [the] limitations provided the requisite inventive concept.” *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.* 841 F.3d 1288, 120 U.S.P.Q.2d 1288 (Fed. Cir. 2016) citing *BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1349 (Fed. Cir. 2016).

The 2014 interim Guidance on Patent Subject Matter Eligibility identifies eligibility for streamlined analysis when a claim is clearly not an attempt to tie up a patent-ineligible concept. (“Interim Guidance,” available at <https://www.gpo.gov/fdsys/pkg/FR-2014-12-16/pdf/2014-29414.pdf> (last visited 1/17/18)). The Inter Guidance describes that “a claim directed to a complex manufactured industrial product or process that recites meaningful limitations along with a judicial exception may sufficiently limit its practical application so that a full eligibility analysis is not needed.” (*Id.* at I.B.3). See also *McRO v. Bandai*, case no.

2015-1080 (September 13, 2016) (the “concern underlying the exceptions to § 101 is not tangibility, but preemption”); *Alice* 134 S. Ct. 2347 (the “preliminary question in applying the exceptions to [§ 101] is whether the claim raises § 101 abstractness concerns at all. Does the claim pose any risk of preempting an abstract idea? In most cases, the answer plainly will be no.”).

The amended claims recite a key identification system comprising (i) an imaging system including a first camera and (iii) at least one mirror. Items (i)-(iii) include subject matter that is clearly directed towards a complex industrial system and is not an attempt to tie up use of any Mental Processes or abstract ideas thereof. *Compare with* Claims 1-30 to *Thales Visionix Inc. v. U.S.*, 850 F.3d 1343, 121 U.S.P.Q.2d 1898 (Fed Cir. 2017) (holding that claims reciting an arrangement of sensors to track an object’s motion were patentable even when they included abstract ideas).

Furthermore, “[a] key identification system comprising: an imaging system including a first camera and at least one mirror wherein said imaging system is configured to capture a first image of a master key and a second image of said master key, wherein the at least one mirror allows said first camera at a remote position to capture multiple angles of said master key, and said first image different than said second image,” as recited in claim 21 is clearly not a system that could be preformed merely by a human mental process.

It is further noted that even if streamlined examination under § 101 is not granted, the subject claims recite additional limitations that qualify as “significantly more” in accordance with *Alice*. As such, it is respectfully submitted that the 101 rejection has been sufficiently addressed and should be withdrawn.

III. §103 Rejections

Claim 21 stand rejected as allegedly obvious over Campbell. Claim 21 has been amended to recite additional features that are not present in Campbell. Claim 21 now

additionally recites: “an imaging system including a first camera and at least one mirror wherein said imaging system is configured to capture a first image of a master key and a second image of said master key, wherein the at least one mirror allows said first camera at a remote position to capture multiple angles of said master key, and said first image different than said second image.”

It is submitted that Campbell and the remaining cited references, alone or in combination, do not disclose, teach, or suggest the claimed subject matter of independent claim 21. Applicant respectively submits that Campbell is directed to a key identification system that includes a housing with a first receiver 28 and a second receiver 50 for capturing an image of a single side and a from a single angle of a master key. In the embodiment of Figures 4 and 5 of Campbell, either the first receiver or the second receiver are configured to take only one image of the master key. Campbell and the remaining prior art of record, are silent regarding an imaging system including a first camera and at least one mirror... hwerein the at least one mirror allows said first camera...to capture multiple angles of said master key.

Thus, for at least this reason, Campbell alone or in combination fails to amount to a *prima facie* case of obviousness as the combined teachings of the cited art fail to teach each and every feature as recited by the independent claim 21. For at least this reason, all remaining claims 21-39 are patentable over the cited references and are in condition for allowance.

CONCLUSION

In light of the foregoing, Applicants submits that the application is now in condition for acceptance. If the Examiner has any questions pertaining to the above, then the undersigned attorney would welcome a phone call to provide any further clarification or a formal interview.

Respectfully submitted,

Date: June 30, 2020

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Electronic Patent Application Fee Transmittal				
Application Number:		15920955		
Filing Date:		14-Mar-2018		
Title of Invention:		KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING		
First Named Inventor/Applicant Name:		Chester O.D. Thompson		
Filer:		Mark Jason Masterson/Danielle Mueller		
Attorney Docket Number:		16223-00341		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 3 months with \$0 paid	2253	1	700	700
Miscellaneous:				
Total in USD (\$)				700

Electronic Acknowledgement Receipt	
EFS ID:	39866494
Application Number:	15920955
International Application Number:	
Confirmation Number:	2833
Title of Invention:	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING
First Named Inventor/Applicant Name:	Chester O.D. Thompson
Customer Number:	33772
Filer:	Mark Jason Masterson/Danielle Mueller
Filer Authorized By:	Mark Jason Masterson
Attorney Docket Number:	16223-00341
Receipt Date:	30-JUN-2020
Filing Date:	14-MAR-2018
Time Stamp:	11:14:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$700
RAM confirmation Number	E20206TB14216210
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		8932230.pdf	198950	yes	10
			054d927d4500c106816e77589cdf3889e589cf9a		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	4	
	Applicant Arguments/Remarks Made in an Amendment		5	10	
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Information:					
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Warnings:					
Information:					
Total Files Size (in bytes):			229825		

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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 15/920,955		Filing Date 03/14/2018		☐ To be Mailed		
ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO										
APPLICATION AS FILED - PART I										
		(Column 1)	(Column 2)							
FOR		NUMBER FILED	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), (l), 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(j))		minus 20 =	*	x \$50 =						
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =	*	x \$230 =						
☐ 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										
		(Column 1)	(Column 2)	(Column 3)						
AMENDMENT	06/30/2020	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))	* 19	Minus	** 20	= 0	x \$50 =		0		
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0	x \$230 =		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)	(Column 2)	(Column 3)						
		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$0 =				
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =				
	☐ 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.					LIE					
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".					/KIMBERLY N PANNELL/					
*** 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.										

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.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
HAUSMANN, MICHELLE M	

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2661	

NOTIFICATION DATE	DELIVERY MODE
12/30/2019	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipmailbox@mcdonaldhopkins.com

Office Action Summary	Application No. 15/920,955	Applicant(s) Thompson et al.	
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661	AIA (FITF) 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 MONTHS 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 3/14/2018.
☐ 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) 21-39 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) 21-39 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 ____ 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.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
 Paper No(s)/Mail Date ____.
- 3) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date ____.
- 4) ☐ Other: ____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Claim Interpretation

2. The following is a quotation of 35 U.S.C. 112(f):

(f) Element in Claim for a Combination. – An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

The following is a quotation of pre-AIA 35 U.S.C. 112, sixth paragraph:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

3. This application includes one or more claim limitations that do not use the word “means,” but are nonetheless being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, because the claim limitation(s) uses a generic placeholder that is coupled with functional language without reciting sufficient structure to perform the recited function and the generic placeholder is not preceded by a structural modifier. Such claim limitation(s) is/are: “key identification system comprising” and “a logic configured to map data points” **in claim 21 (and by dependency, claims 22-39).**

Because this/these claim limitation(s) is/are being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, it/they is/are being interpreted to cover the corresponding structure described in the specification as performing the claimed function, and equivalents thereof.

If applicant does not intend to have this/these limitation(s) interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, applicant may: (1) amend the claim limitation(s) to avoid it/them being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph (e.g., by reciting sufficient structure to perform the claimed function); or (2) present a sufficient showing that the claim limitation(s) recite(s) sufficient structure to perform the claimed function so as to avoid it/them being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph.

NOTE ON 101: If the applicant amends to no longer be interpreted under 35 USC 112 f/6th, the logic of claim 21 likely becomes **pure software**, so any amendments should take into consideration the potential 35 USC 101 rejections for lacking a non-transitory CRM in future claim language as well.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. **Claim 21 (and by dependency claims 22-39)** are rejected under 35 U.S.C. 101 because the claimed invention is directed to an abstract idea without significantly more. The claim recites: a key identification system comprising... a logic configured to map data points from said first image to corresponding data, points from said second image to determine characteristics of a contour of said master key; and wherein said logic compares said characteristics of said contour with characteristics of known key blanks to determine the likelihood of a match between said master key and a known key blank. If a claim limitation, under its broadest reasonable interpretation, covers performance of the limitation in the mind but for the recitation of generic computer components, then it falls within the "Mental

Processes" grouping of abstract ideas. Accordingly, these limitations fall under the mental processes category and are stated at a high level of generality, and recite an abstract idea. This judicial exception is not integrated into a practical application.

Examiner recommends indicating what the key identification system does with the information regarding the likelihood of a match for instance, in order to integrate the concept into a practical application.

Note

6. **Claim 21** is NOT rejected on the ground of nonstatutory double patenting over claim 24 or 26 of U.S. Patent No. 9514385. However, a note is made herein that while at the present the different views/mirror of U.S. Patent No. 9514385 and the images/mapping points of the instant application are still distinct, if prosecution brings the claims into closer correspondence, a terminal disclaimer could be required in the future.

Claim Rejections - 35 USC § 103

7. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

8. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claims 21, 22, 25-34, and 37** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1).

Regarding claim 21, Campbell et al. disclose a key identification system comprising: an imaging system including a first camera configured to capture a first image of a master key and a second camera, configured to capture a second image of said master key, said first image different than said second image ("Preferably, second receiver 50 is positioned such that the viewing range 54 of the second receiver 50 overlaps viewing range 42 of receiver 28. Thus, receiver 28 will capture an image of a first part of master key 32 and second receiver 50 will capture an image of a second part of the master key", [0053]); a logic configured to map data, points from said first image to corresponding data, points from said second image to determine characteristics of a contour of said master key (images captured by receiver 28 and second receiver 50 can be combined to create a complete image of the master key, [0053], first luminous surface 24 includes reference marks 55 to aid in combining the images of the key captured by receiver 28 and second receiver 50, reference marks 55 are used when the two separate images are combined to form a single image of the master key and ensure that the image of the key is properly combined, [0054], edge map of the master key, edge map is an array of points that define the relative locations of different points along the edges of the master key, [0077]); and wherein said logic compares said characteristics of said contour with characteristics of known key blanks to determine the likelihood of a match between said master key and a known key blank (comparing information about the head, shoulder, and blade of the master key to similar information about known key blanks, the key blank corresponding to the master key may be identified, [0038], searches the known key blanks in the database to filter out key blanks that have different numbers of cut edges and have blade lengths that are

outside a certain tolerance of the blade length of the master key, subset of potential matches, [0084], "If the shape comparison based on the shape description string fails to produce a score indicative of a match, the control may perform a comparison based on the contour description string for the master key and potential key blank matches. It is contemplated that the contour description matching described below may be performed prior to or instead of the shape description string matching. The contour description matching may be a "pass or fail" type matching process. If the contour description matching process yields a "passing" score, the corresponding key blank is added to the list of possible matches", [0089], contour matching score, aid in identifying the appropriate key blank, [0093]-[0095], [0097], score values over a specific threshold are considered to be matched shapes, [0100]).

Campbell et al. do not use the exact language "likelihood of a match". It would have been obvious at the time of the invention to one of ordinary skill in the art that the score described by Campbell et al. can encompass a likelihood, as a score is one way to convey a likelihood.

Regarding claim 22, Campbell et al. disclose the key identification system of claim 21.

Campbell et al. further disclose characteristics of said contour includes outline data wherein said outline data includes a plurality of data points ("The control then analyzes the silhouette image of the key to create an edge map of the master key (step 110). The edge map is an array of points that define the relative locations of different points along the edges of the master key ", [0077]).

Regarding claim 25, Campbell et al. disclose the key identification system of claim 21.

Campbell et al. further disclose said logic includes a database containing data related to

characteristics of grooves of known key blanks (searches the known key blanks in the database to filter out key blanks that have different numbers of cut edges, [0084], control compares each mill shape descriptor of the master key to the mill shape descriptor of the known key blanks and scores the comparison, [0100], whether the key blank has unique milling patterns on both sides, the indicator in the database is marked accordingly, [0107]).

Regarding claim 26, Campbell et al. disclose the key identification system of claim 21.

Campbell et al. further disclose said logic is configured to generate tolerance and or correlation values to determine the likelihood that the comparison yields a match (comparing information about the head, shoulder, and blade of the master key to similar information about known key blanks, the key blank corresponding to the master key may be identified, [0038], tolerance of the blade length of the master key, comparison, [0084], [0087], the similarity of each comparison is assigned a score, [0088], score indicative of a match, the control may perform a comparison based on the contour description string for the master key and potential key blank matches, [0089], contour match sum is compared to an ideal match score, [0094], employ a ranking system to identify the key blanks that are most similar to one another, [0096], matching type section having a size that is between the first tolerance level and a second tolerance level is given a partial score, [0104]).

Regarding claim 27, Campbell et al. disclose the key identification system of claim 21.

Campbell et al. further disclose said first image is a digital image (receiver is a high resolution digital camera, [0047], control analyzes the pixels of this image of the master key to identify the milling exit shape, [0098]).

Regarding claim 28, Campbell et al. disclose the key identification system of claim 21.

Campbell et al. further disclose said second image comprises a silhouette of a blade of said master key (profile of the master key reveals the shape and size of the head and shoulder of the master key, as well as the length of the key blade, [0044]).

Regarding claim 29, Campbell et al. disclose the key identification system of claim 21.

Campbell et al. further disclose said second image comprises a silhouette of a tip of said master key (outline the profile of the master key, [0044], control then analyzes the silhouette image of the key to create an edge map of the master key, [0077], extreme points represent the tip 62 and the head 64 of the key, [0078], establishes the tip end of the spine by searching the edge map of the key, [0080]).

Regarding claim 30, Campbell et al. disclose the key identification system of claim 21.

Campbell et al. further disclose said characteristics of said contour are determined based on image data from at least said two or more views of said master key (images captured by receiver 28 and second receiver 50 can be combined to create a complete image of the master key, [0053], first luminous surface 24 includes reference marks 55 to aid in combining the images of the key captured by receiver 28 and second receiver 50, reference marks 55 are used when the two separate images are combined to form a single image of the master key and ensure that the image of the key is properly combined, [0054], edge map of the master key, edge map is an array of points that define the relative locations of different points along the edges of the master key, [0077]).

Regarding claim 31, Campbell et al. disclose the key identification system of claim 30.

Campbell et al. further disclose said logic calculates the geometry of the contour as though a tip of said master key were squarely cut based on data from at least said two or more views of said master key (size and shape of key head 64 and shoulder area 70 are features of the master key 32 that are useful in identifying the corresponding key blank, [0035], head shape, [0065], width descriptions are combined into a single shape description string, [0085], contour information is derived from the shape of the outer perimeter of head, [0086] shape description string matching, [0089], [0098], [0104]).

Regarding claim 32, Campbell et al. disclose the key identification system of claim 21.

Campbell et al. further disclose a key holder configured to hold said master key (master key 32 may be placed directly on first luminous surface 24 or a transparent support, [0044]).

Regarding claim 33, Campbell et al. disclose the key identification system of claim 32.

Campbell et al. further disclose in the prior art said key holder includes a clamp (master key may be positioned in a clamp and a cutting mechanism, [0004]). It would have been obvious at the time of filing to one of ordinary skill in the art to use a clamp as described in the prior art embodiments, as this is one of a limited number of ways to secure a key.

Regarding claim 34, Campbell et al. disclose the key identification system of claim 21.

Campbell et al. further disclose one of said views of said master key includes a view from above the master key blade of a groove in the bottom of said blade (see receiver 28 in Fig. 1, Fig. 2).

Regarding claim 37, Campbell et al. disclose the key identification system of claim 21.

Campbell et al. further disclose said logic includes a tolerance range for each characteristic of said master key to determine whether a master key passes or fails to match a known key blank ([0087], [0104]).

10. **Claim 23** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1) as applied to claim 22 above, further in view of Barkman et al. (IDS: US 5255199 A).

Regarding claim 23, Campbell et al. disclose the key identification system of claim 22.

Campbell et al. do not explicitly disclose said plurality of data points is selectively adjustable along an interval to adjust accuracy of groove identification.

Barkman et al. teach a plurality of data points is selectively adjustable along an interval to adjust accuracy of groove identification (removing inaccurate edge point data from the collected data points relating to the cutting tool edge, remove these inaccurate tangent edge points to increase the accuracy of measurement calculations subsequently performed, col. 6, lines 30-50).

Campbell et al. and Barkman et al. are in the same art of edge inspection (Campbell et al., [0051]; Barkman et al., abstract). The combination of Barkman et al. with Campbell et al. will enable the change in the number of data points used. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the point number adjustment of Barkman et al. with the invention of Campbell et al. as this was known at the time of filing, the

combination would have predictable results, and as Barkman et al. indicate this will increase accuracy (col. 6, lines 30-50), and better identifying an edge will be an advantage when determining a number of bittings to determine a correct blank in the invention of Campbell et al.

11. **Claim 24** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1) as applied to claim 21 above, further in view of Hillman et al. (US 20040013291 A1).

Regarding claim 24, Campbell et al. disclose the key identification system of claim 21. Campbell et al. do not explicitly disclose said imaging system further comprises a crop box for limiting the image of the master key, wherein said crop box defines the outer periphery of at least said first and second images of said master key.

Hillman et al. teach a crop box for limiting the image of the object of interest, wherein said crop box defines the outer periphery of at least said first and second images of said object of interest (extracting the edges of the scan, pinpointing reference points on it, positioning, standardizing, and aligning it; autocropping, extracting a plurality of features and/or regions within the scan; correlating said regions or features with database images and parameters, abstract, pinpointing of reference points is done by use of a matching template images, [0030], matching template images of the brain to database images of brains, include specific 2-D slices, [0045], identifying and aligning the image brain scan using template matching then by use of further template matching, a point on the object is chosen as a reference point, [0064], "Parameters necessary for cropping the relevant digital feature images are optimized; the digital feature images are

cropped based on the optimized cropping parameters for selecting profile and relevant feature for further analysis", [0065]).

Campbell et al. and Hillman et al. are in the same art of matching image features to a template (Campbell et al., [0097]; Hillman et al., [0045]). The combination of Hillman et al. with Campbell et al. will enable the use of a crop box. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the crop box of Hillman et al. with the invention of Campbell et al. as this was known at the time of filing, the combination would have predictable results, and as this will minimize analysis of extraneous information, which will improve efficiency in making comparisons to key blanks in a database as described in the invention described by Campbell et al.

12. **Claim 35** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1) as applied to claim 21 above, further in view of Wills et al. (IDS: US 6064747 A).

Regarding claim 35, Campbell et al. disclose the key identification system of claim 21. Campbell et al. do not explicitly disclose one of said views of said master key includes a view from an angle between perpendicular and parallel to the blade of said master key and not including perpendicular or parallel to the blade of said master key.

Wills et al. teach one of said views of said master key includes a view from an angle between perpendicular and parallel to the blade of said master key and not including perpendicular or parallel to the blade of said master key (angle of the surface of the key relative to the light

beam LB and camera 28 at the point of intersection also affects the intensity incident upon the camera, col. 13, lines 20-50, Fig. 6).

Campbell et al. and Wills et al. are in the same art of key inspection (Campbell et al., abstract; Wills et al., abstract). The combination of Wills et al. with Campbell et al. will enable the use of a particular view angle. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the angle of Wills et al. with the invention of Campbell et al. as this was known at the time of filing, the combination would have predictable results, and as it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges (such as the best viewing angle) involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

13. **Claim 36** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1) as applied to claim 21 above, further in view of Gimelfarb et al. (US 20060147289 A1).

Regarding claim 36, Campbell et al. disclose the key identification system of claim 21. Campbell et al. do not explicitly disclose the logic is configured to shift data related to said characteristics of said contour to compare with said known key blank characteristics.

Gimelfarb et al. teach the logic is configured to shift data related to said characteristics of said contour to compare with said known key blank characteristics (bittings aligned to master key, slidable along axis, abstract, [0014], [0030], [0035]).

Cambell et al. and Gimelfarb are in the same art of copying keys (Cambell et al., abstract; Gimelfarb, abstract). The addition of Gimelfarb would a slidable alignment method. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the sliding alignment of Gimelfarb with the invention of Campbell et al., as this was known at the time of the invention, would have predictable results, and as this allows for more easy key positioning and comparison.

14. **Claim 38** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1) as applied to claim 21 above, further in view of Gallarda et al. (US 6539106 B1).

Regarding claim 38, Campbell et al. disclose the key identification system of claim 21. Campbell et al. do not explicitly disclose said logic is configured to generate a series of comparisons to compensate for registration errors.

Gallarda et al. teach logic is configured to generate a series of comparisons to compensate for registration errors ("The features are stored or represented as data structures, e.g. linked lists, that do not necessarily list the features in the same order in the list for the test image as in the list for the reference image. (Feature extraction order may vary depending on a variety of factors, including the relative stage position error.) Features of the test and reference images thus cannot be matched by overlaying the data structure. Matching is therefore based on the physical location (e.g. x, y coordinate location) of the feature, corrected as needed for image alignment offset (e.g., using the result of an image alignment algorithm). Matching takes into account features which are missing in an image, whether because they are outside the field of

view (e.g., due to stage errors) or due to wafer processing errors (i.e., defects)", col. 16, lines 50-68).

Campbell et al. and Gallarda et al. are in the same art of matching image features to a template (Campbell et al., [0097]; Gallarda et al., col. 3, lines 20-55). The combination of Gallarda et al. with Campbell et al. will enable the compensation of registration errors. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the correction of Gallarda et al. with the invention of Campbell et al. as this was known at the time of filing, the combination would have predictable results, and as Gallarda et al. indicate "Alignment of reference and test images or image regions does not require pixel accuracy. Image alignment need only be close enough so that corresponding features between images or image regions will be correctly matched" (col. 5, line 60 – col. 6, line 5), which is beneficial when matching between a master key and key blank templates when the image of Campbell et al. is likely to not be completely perfect and some leeway will be required to perform a registration.

15. **Claim 39** is/are rejected under 35 U.S.C. 103 as being unpatentable over Campbell et al. (IDS: US 20020191849 A1) as applied to claim 21 above, further in view of Satoh et al. (US 20090022369 A1).

Regarding claim 39, Campbell et al. disclose the key identification system of claim 21.

Campbell et al. do not explicitly disclose said logic includes at least one roll constant used to adjust the plurality of data, points to increase accuracy of a match with a known key blank.

Satoh et al. teach logic includes at least one roll constant used to adjust the plurality of data, points to increase accuracy of a match with a template ("the position/orientation calculation unit 1720 calculates a correction matrix ΔR_{WC_1} used to apply correction to three parameters (pan, tilt, and roll angles) of the orientation measurement value of the image capture device 130, so as to cancel errors on the detected indices", [0241], [0244]; template matching, [0063], [0288]). [Campbell et al. teach matching known key blanks in a database]

Campbell et al. and Satoh et al. are in the same art of imaging a target object (Campbell et al., abstract; Satoh et al., [0023]). The combination of Satoh et al. with Campbell et al. will enable the compensation of roll. It would have been obvious at the time of the invention to one of ordinary skill in the art to combine the roll correction of Satoh et al. with the invention of Campbell et al. as this was known at the time of filing, the combination would have predictable results, and as Satoh et al. indicate "The present invention has been made in consideration of the problems of such prior arts, and has as its object to provide a position/orientation measurement method and apparatus, which can measure the position and orientation of a measurement target object while simultaneously achieving high stability and high precision" ([0023]), which will be beneficial as there will inevitably be some imaging error in the system of Campbell et al. that would benefit from correction.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHELLE M ENTEZARI HAUSMANN whose telephone number is (571)270-5084. The examiner can normally be reached on 10-7 M-F.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, VINCENT M RUDOLPH can be reached on (571)272-8243. 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 <https://ppair-my.uspto.gov/pair/PrivatePair>. 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.

/MICHELLE M ENTEZARI/
Primary Examiner, Art Unit 2661

<i>Notice of References Cited</i>	Application/Control No. 15/920,955		Applicant(s)/Patent Under Reexamination Thompson et al.	
	Examiner MICHELLE M ENTEZARI HAUSMANN		Art Unit 2661	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
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*	B	US-6539106-B1	03-2003	Gallarda; Harry S.	G01R31/307	382/149
*	C	US-20090022369-A1	01-2009	Satoh; Kiyohide	G01B21/04	382/106
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
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	S					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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*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.

U.S. Patent and Trademark Office
PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 20191218

<i>Search Notes</i> 	Application/Control No. 15/920,955	Applicant(s)/Patent Under Reexamination Thompson et al.
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661

CPC - Searched*		
Symbol	Date	Examiner
B23C2235/12, 41	12/17&12/19/2019	Entezari
B23C3/35	12/17&12/19/2019	Entezari
G06K9/00208, 2036, 209, 48, 6202	12/17&12/19/2019	Entezari
G06T2207/10141	12/17&12/19/2019	Entezari
G06T7/62	12/17&12/19/2019	Entezari
H04N5/247	12/17&12/19/2019	Entezari
Y10T409/300952, 301008, 301064	12/17&12/19/2019	Entezari

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
see EAST search, includes INV, IDS	12/17-12/21/2019	Entezari
see google scholar search	12/21/2019	Entezari
see ip.com search	12/21/2019	Entezari

<i>Search Notes</i> 	Application/Control No. 15/920,955	Applicant(s)/Patent Under Reexamination Thompson et al.
	Examiner MICHELLE M ENTEZARI HAUSMANN	Art Unit 2661

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner



Articles

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Any time

Since 2019

Since 2018

Since 2015

Custom range...

Sort by relevance

Sort by date

☒ Include patents

☒ Include citations

Create alert

Key blank identification system with groove scanning

COD Thompson, WR Mutch - US Patent 8,644,615, 2014 - Google Patents

... right cuts are only matched to data for single cut **blanks** and only right cut data for those **blanks** ... **key** reference sides (eg in the case of a single sided **key**, the flat of the **blank**) are near ... To compensate for this **roll**, each **key** ID system may have a **roll constant** that is used to adjust ...

☆ 00 Cited by 39 Related articles All 4 versions »

Key blank identification system with groove scanning

COD Thompson, WR Mutch - US Patent App. 15/920,955, 2018 - Google Patents

... In other embodiments, larger numbers of **roll** values may be used to handle greater ... logic includes a database containing data related to characteristics of grooves of known **key blanks** ... to said characteristics of said contour to compare with said known **key blank** characteristics ...

☆ 00 All 2 versions »

Key blank identification system with groove scanning

COD Thompson, WR Mutch - US Patent 9,514,365, 2016 - Google Patents

... These hard-to-notice subtleties significantly **increase** the level of difficulty for all operators of such **key** replication ... systems compare scanned data from a master **key** to be copied with data from known **key blanks** in order to determine if the master **key** matches the **key blank** ...

☆ 00 Cited by 1 Related articles All 4 versions »

Key blank identification system with groove scanning

COD Thompson, WR Mutch - US Patent 9,934,443, 2018 - Google Patents

... **Key blanks** that do not have characteristics **consistent** with those of the master **key** may be then ruled out as possible **matches** for the **key blank** ... The groove contour may be compared to contours of known **key blanks** stored in the database to determine a **matching key blank** ...

☆ 00 Related articles All 4 versions »

Differential neural responses during performance of matching and nonmatching to sample tasks at two delay intervals

R.Elliott, R.J.Dolan - Journal of Neuroscience, 1999 - Soc Neuroscience

☆ 00 Cited by 202 Related articles All 14 versions »

The functions of the orbitofrontal cortex

E.T.Rolls - Brain and cognition, 2004 - Elsevier

... objects must be remembered for short periods, eg, delayed **matching** to **sample** and delayed **matching** to non ... dorsolateral part of the prefrontal cortex, which is concerned with spatial short-term memories, **consistent** with its inputs from the parietal cortex (see, eg, **Rolls** & Deco ...

☆ 00 Cited by 1202 Related articles All 15 versions »

The effects of fornix and medial prefrontal lesions on delayed non-matching-to-sample by rats

C Shaw, J.P.Aggleton - Behavioural brain research, 1993 - Elsevier

... **Key** words: Recognition memory; Fornix; Prefrontal cortex; Recency; Delayed non-**matching-to-sample** ... between the familiar and the un- familiar box and replaced by a **blank** start box ... This result appears **consistent** with the finding that while damage to the closely related medial ...

☆ 00 Cited by 216 Related articles All 10 versions »

InnovationQ PLUS POWERED BY IBS AND JPL.COM

Discover **PAT+NPI** key blank roll constant increase match template + 0

Visuals Query Results 0 Selected Relevance None None

1 - 50

- Roll forming device of paired-roll blank**

This utility model claims a pair of the roller of the blank roller forming apparatus it comprises a fixed mould plate of moving mould with the fixed template and moving mould plate is formed...

CURRENT ASSIGNEES: JINCAI LU
CN201684823U | CHINA PATENTS | 29-DEC-2010
- Rolling and molding device of blank roller pair**

This invention claims a pair of the roller of the blank roller forming apparatus it comprises a fixed mould plate of moving moulding the fixed template and moving mould plate is formed...

CURRENT ASSIGNEES: JINCAI LU
CN101898223A | CHINA APPLICATIONS | 01-DEC-2010
- Apparatus and method for template cutting**

CURRENT ASSIGNEES: P & F IND INC
US3453933 | US PATENTS | 08-JUL-1969
- Taper rolling device for leaf spring**

PURPOSE:To improve the rolling efficiency by using a template which is preliminarily formed to a prescribed shape to draw out a bl the outlet and the speed of a drawing-out mechanism....

CURRENT ASSIGNEES: NIHON HATSUJIKOU KK
JPS60231519A | JAPAN APPLICATIONS | 18-NOV-1985
- Method of making high-accuracy manifold sections**

FIELD: manufacture of high-accuracy manifold sections. SUBSTANCE: method comprises steps of preliminarily rolling initial blanks, / sharpening rollers in single pass; tilting paired blank by 90...

CURRENT ASSIGNEES: AKTIONERNOE OBSHCHESTVO OTKRYTOGO TIPA KAMENSK URAL SKII ZAVOD PO OBRABOTKE TSIVETNYKH METALLOV
RU2090273C1 | RUSSIA PATENTS | 20-SEP-1997
- Continuously poor slab turns round rolling mold**

The invention discloses a kind of continuously poor slab turns round rolling mold, including upper die plate, lower template and th component is included the screw mandrel arranged along matched...

CURRENT ASSIGNEES: CHONGQING JIAOTONG UNIV
CN105057344B | CHINA PATENTS | 15-MAR-2017
- Billet gripper and feed mechanism for cold pipe mill - has spring-loaded gripper blocks, moved using lever operated n**

The gripper and feed mechanism consists of spring loaded gripper blocks (14), a lever operated mechanism (6) for moving the grip in contact with the gripper blocks (14) and mounted...

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S2	1	(contour or boundary or boundaries or edge or groove or biting or pattern or outline) with key with (images! or second image!) and (images! or second image!) with master adj2 key and (probability or likelihood or confidence) near2 (matching or matched or match or correspond or corresponding or corresponded or compatible or fit or fitting or commensurate) with blank	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/17 10:40
S3	155	Thompson near2 Chester.inv. or Mutch near2 William.inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/17 11:09
S5	13	(contour or boundary or boundaries or edge or groove or biting or pattern or outline) same key same (images! or second image!) and (images! or second image!) with (master or original) adj2 key and (probability or likelihood or confidence) near2 (matching or matched or match or correspond or corresponding or corresponded or compatible or fit or fitting or commensurate) with blank	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/17 11:10
S4	0	(contour or boundary or boundaries or edge or groove or biting or pattern or outline) with key with (images! or second image!) and (images! or second image!) with original adj2 key and (probability or likelihood or confidence) near2 (matching or matched or match or correspond or corresponding or corresponded or compatible or fit or fitting or commensurate) with blank	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/17 11:10
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S23	4	S20 and S22	US-PGPUB;	NEAR	OFF	2019/12/17

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S22	52519	((B23C2235/12 OR B23C2235/41 OR B23C3/35 OR G06K9/00208 OR G06K9/2036 OR G06K9/209 OR G06K9/48 OR G06K9/6202 OR G06T2207/10141 OR G06T7/62 OR H04N5/247 OR Y10T409/300952 OR Y10T409/301008 OR Y10T409/301064).CPC.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/17 22:10
S21	2	"20070224008".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/17 22:10
S20	117	(contour or boundary or boundaries or edge or groove or biting or pattern or outline) with (views! or second view! or video or frames!) with (map or mapped or mapping or combine or combined or combining or fuse or fused or fusing) and (images! or second image!) with (master or original or reference) and (probability or likelihood or confidence) near2 (matching or matched or match or correspond or corresponding or corresponded or compatible or fit or fitting or commensurate or correlation or correlate or correlated or correlating)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/17 22:10
S26	12	(contour or boundary or boundaries or edge or groove or biting or pattern or outline) with (cameras! or second camera!) with (map or mapped or mapping or combine or combined or combining or fuse or fused or fusing) and (images! or second image!) with (master or original or reference) and (probability or likelihood or confidence) near2 (matching or matched or match or correspond or corresponding or corresponded or compatible or fit or fitting or commensurate or correlation or correlate or correlated or correlating)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/17 22:16
S27	6	(contour or boundary or boundaries or edge or groove or biting or pattern or outline) with (cameras! or second camera!) with (map or mapped or mapping or combine or combined or combining or fuse or fused or fusing) same (master or original or reference) and (probability or likelihood or confidence) near2 (matching or matched or match or correspond or corresponding or corresponded or compatible or fit or fitting or commensurate or correlation or correlate or correlated or correlating)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/17 22:17

S28	47	(contour or boundary or boundaries or edge or groove or biting or pattern or outline) with (views! or second view! or video or frames!) with (map or mapped or mapping or combine or combined or combining or fuse or fused or fusing) same (master or original or reference) and (probability or likelihood or confidence) near2 (matching or matched or match or correspond or corresponding or corresponded or compatible or fit or fitting or commensurate or correlation or correlate or correlated or correlating)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/17 22:18
S31	14	(S23 or S26 or S27 or S28) and @ad< "20090901"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/17 22:24
S32	146	(S17 or S18) and (video or second (frame or image or view or camera) or views! or captur\$3 with angles! or images!)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/17 22:27
S33	140	S32 and @ad< "20090901"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/17 22:28
S35	7	S34 and @ad< "20090901"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/17 22:41
S34	8	(S17 or S18) and (map or mapped or mapping) near2 points!	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/17 22:41
S38	155	Thompson near2 Chester.inv. or Mutch near2 William.inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/18 20:40
S48	5	S47 and (probability or likelihood or confidence) near2 (matching or matched or match or correspond or corresponding or corresponded or compatible or fit or fitting or commensurate or correlation or correlate or correlated or correlating)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/18 21:06

S47	140	S46 and @ad< "20090901"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/18 21:06
S46	146	(S44 or S45) and (video or second (frame or image or view or camera) or views! or captur\$3 with angles! or images!)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/18 21:06
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S54	6	(S44 or S45) and (changing or change or changed or altering or alter or altered or alteration or adjusted or adjust or adjusting or increased or increase or increasing or decrease or decreased or decreasing or attenuate or attenuated or attenuating or attenuation or modify or modified or modifying or modification or tailor or tailored or tailoring or regulate or regulating or regulation or regulated or tune or tuning or tuned or tunable or revise or revised or revising or shift or shifting or shifted or vary or varied or varying or transition or transitioned or transitioning or correct or corrected or correcting or correction or amend or amending or amended or amendment or adapt or adapted or adapting or adaptation or tweak or tweaked or tweaking or modulate or modulated or modulation or modulating or morphed or morph or morphing or deform or deformed or deforming or deformation or lower or lowered or lowering or raise or raised or raising) with (point or pixel) with (accuracy or tolerance or precision or threshold)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/18 21:21
S55	5	S54 and @ad< "20090901"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/18 21:22
S60	1	(S44 or S45) and (crop or cropped or cropping or bounding box or region interest) with (peripheral or periphery or limit or limited or limiting)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/18 21:39
S59	1	(S44 or S45) and (crop or cropped or cropping or bounding box or region interest) with (peripheral or periphery)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/18 21:39

S61	125	(crop or cropped or cropping or bounding box or region interest) with (peripheral or periphery or limit or limited or limiting) with key	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/18 21:52
S62	17	S61 and @ad< "20090901"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/18 21:53
S64	4	(S44 or S45) and (window) with (peripheral or periphery or limit or limited or limiting)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/18 21:54
S63	16	(crop or cropped or cropping or bounding box or region interest) with (key or view or frame or video or image) and key adj2 blank	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/18 21:54
S65	14	(S44 or S45) and (crop or cropped or cropping or bounding box or window) with (image or view or perspective or frame or video)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/18 21:56
S68	12	(S65 or S66) and @ad< "20090901"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/18 21:57
S67	5	S63 and @ad< "20090901"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/18 21:57
S66	1	(S44 or S45) and (crop or cropped or cropping or bounding box or window) with (capture or captured)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/18 21:57
S71	1610	S70 and @ad< "20090901"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	NEAR	OFF	2019/12/18 22:01

			DERWENT; IBM_TDB			
S70	5015	(crop or cropped or cropping or box or bounding box) near2 (peripheral or periphery or central or relevant or irrelevant) with (frame or image or view or captured or capture or viewport or scan)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/18 22:01
S73	12	S72 and @ad< "20090901"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/18 22:05
S72	12	S71 and (match or matched or matching or compare or compared or comparing) near3 (database or template or reference) near2 (frame or image or view or captured or capture or viewport or scan)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/18 22:05
S87	3	(S85 or S86) and (square or squarely or blunt or bluntly) cut	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/19 21:22
S86	93	("5496138" "5497888" "5503785" "5515903" "5538374" "5543103" "5545367" "5552992" "5555176" "5556240" "5583443" "5592728" "5594652" "5607267" "5617323" "5630332" "5660509" "5671523" "5676504" "5677522" "5711643" "5739766" "5764156" "5771176" "5807042" "5855836" "5886775" "5906365" "5908273" "5926388" "5940229" "5964554" "5966457" "5982491" "5984597" "5997224" "5997795" "6053677" "6059495" "6064747" "6065911" "6082580" "6094953" "6152662" "6175638" "6179531" "6185311" "6186711" "6243960" "6321430" "6406227" "6415931" "6449381" "6478515" "6543972" "6588995" "6602030" "6612142" "6641339" "6647308" "6687565" "6711557" "6801829" "6817814" "6836553" "6839449" "6839451" "6895100" "6959862" "6965911" "7010498" "7111894" "7114436" "7114894" "7163364" "7214011" "7484446" "7643685" "7890878" "7891919" "7918629" "8128322" "8532809" "8585029" "8634655" "8644619" "D251365" "D257758" "D348393" "D455104" "RE26848" "RE27665" "RE35518").PN.	US-PGPUB; USPAT	NEAR	OFF	2019/12/19 21:22

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S96	6269	(orientation or angle) with relative with key	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/19 22:26
S99	46	S98 and S97	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/19 22:48
S98	52552	((B23C2235/12 OR B23C2235/41 OR B23C3/35 OR G06K9/00208 OR G06K9/2036 OR G06K9/209 OR G06K9/48 OR G06K9/6202 OR G06T2207/10141 OR G06T7/62 OR H04N5/247 OR Y10T409/300952 OR Y10T409/301008 OR Y10T409/301064).CPC.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/19 22:48
S97	926	(orientation or angle) with relative near2 key	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/19 22:48
S100	11	S99 and @ad< "20090901"	US-PGPUB; USPAT;	NEAR	OFF	2019/12/19 22:49

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S103	93	(S85 or S86) and (shift\$3 or adjust\$3 or rotat\$4) with blank	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/19 22:59
S104	9	(S85 or S86) and (shift\$3 or adjust\$3 or rotat\$4) with blank with (compar\$4 or match\$3 or correlat\$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/19 23:00
S106	1	(S85 or S86) and registration error	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/19 23:09
S108	374	S98 and (registration or alignment) near2 (error or offset)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/19 23:11
S107	60563	(registration or alignment) near2 (error or offset)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/19 23:11
S110	16	S109 and @ad< "20090901"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/19 23:12
S109	69	S98 and (registration or alignment) near2 (error or offset) with (compar\$4 or key or correlat\$4 or match\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/19 23:12
S111	2	(registration or alignment) near2 (error or offset) with series with key	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/19 23:14

S114	1	(registration or alignment) near2 (error or offset) with series adj2 (compar\$4 or correlat\$4 or match\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/19 23:18
S118	3706	roll\$3 same (correction or correct\$3) adj2 (parameter or factor or coefficient or constant)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/20 10:20
S119	101	S118 and (image or frame or captured or view) near2 (compar\$4 or correlat\$4 or match\$3) and @ad<"20090901"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/20 10:21
S120	0	wafer near2 (inspect\$3 or inspection) and roll\$3 with (correction or correct\$3) with (parameter or factor or coefficient or constant)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/20 12:59
S122	44	S121 and @ad<"20090901"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/20 13:00
S121	80	wafer near2 (inspect\$3 or inspection) and roll\$3 with (parameter or factor or coefficient or constant)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/20 13:00
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S134	190	(key or slide or object or specimen) with (roll or rolling) with (correction or corrected or correcting or compensate or compensated or compensation) and (parameter or factor or coefficient or constant) near2 (correction or corrected or correcting or compensate or compensated or compensation)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	ON	2019/12/21 20:25
S135	98	S134 and @ad< "20090901"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	NEAR	OFF	2019/12/21 20:26

EAST Search History (Interference)

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Doc code: IDS

PTO/SB/08a (01-10)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 07/31/2012. OMB 0651-0031

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	
	Filing Date	2018-03-14
	First Named Inventor	Chester O.D. Thompson
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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	8644619		2014-02-04	Thompson et al.	
	2	8634655		2014-01-21	Thompson et al.	
	3	8585029		2013-11-19	Ryai, Sr.	
	4	8532809		2013-09-10	Freeman	
	5	8128322		2012-03-06	Bass et al.	
	6	7918629		2011-04-05	Belflower et al.	
	7	7891919		2011-02-22	Bass et al.	
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9	7484446		2009-03-02	Gula	
10	7214011		2007-05-08	Ryai, Sr. et al.	
11	7163364		2007-01-16	Foscan et al.	
12	7114894		2006-10-03	Mueller et al.	
13	7114436		2006-10-03	Mueller	
14	7111894		2006-09-26	Kora et al.	
15	7010498		2006-03-07	Berstis	
16	6965911		2005-11-15	Coffman et al.	
17	6959862		2005-11-01	Neumark	
18	6895100		2005-05-17	Pacenzia et al.	
19	6839451		2005-01-04	Campbell et al.	

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	20	6839449		2005-01-04	Campbell et al.	
	21	6836553		2004-12-28	Campbell et al.	
	22	6817814		2004-11-16	Mueller	
	23	6801829		2004-10-05	Kawai	
	24	6711557		2004-03-23	Palaniappan	
	25	6687565		2004-02-03	Wetterlin et al.	
	26	6647308		2003-11-11	Prejean	
	27	6641339		2003-11-04	Chies et al.	
	28	6612142		2003-09-02	Capwell	
	29	6602030		2003-08-05	Markbreit	
	30	6588995		2003-07-08	Wills et al.	

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31	6543972		2003-04-08	Cimino	
32	6478515		2002-11-12	Mueller	
33	6449381		2002-09-10	Yanovsky et al.	
34	6415931		2002-07-09	Mueller	
35	6406227		2002-06-18	Titus et al.	
36	D455104		2002-04-02	Hillman et al.	
37	6321430		2001-11-27	Goldman et al.	
38	6243960		2001-06-12	Andrews et al.	
39	6186711		2001-02-13	Mueller	
40	6185311		2001-02-06	Yanovsky et al.	
41	6179531		2001-01-30	Jaw	

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42	6175638		2001-01-16	Yanovsky	
43	6152662		2000-11-28	Titus et al.	
44	6094953		2000-08-01	Evans	
45	6082580		2000-07-04	Mueller et al.	
46	6065911		2000-05-23	Almblad et al.	
47	6064747		2000-05-16	Wills et al.	
48	6059495		2000-05-09	Mueller et al.	
49	6053677		2000-04-25	Juchinewicz	
50	5997795		1999-12-07	Danforth et al.	
51	5997224		1999-12-07	Beauregard et al.	
52	5984597		1999-11-16	Chen	

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53	5982491		1999-11-09	Breyer et al.	
54	5966457		1999-10-12	Lemelson	
55	5964554		1999-10-12	Drori	
56	5940229		1999-08-17	Baumgarten	
57	5926388		1999-07-20	Kimbrough et al.	
58	5908273		1999-06-01	Titus et al.	
59	5906365		1999-05-25	Wu	
60	5886775		1999-03-23	Houser et al.	
61	5855836		1999-01-05	Leyden et al.	
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63	5771176		1998-06-23	Froehlich et al.	

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64	5764156		1998-06-09	Chaloux	
65	5739766		1998-04-14	Chaloux	
66	5711643		1998-01-27	Parr et al.	
67	5771176		1998-06-23	Froehlich et al.	
68	5677522		1997-10-14	Rice et al.	
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70	5671523		1997-09-30	Juchinewicz	
71	RE35518		1997-05-27	Sussina	
72	5660509		1997-08-26	Cole et al.	
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75	5607267		1997-03-04	Heredia et al.	
76	5594652		1997-01-14	Penn et al.	
77	5592728		1997-01-14	Susnjara	
78	5583443		1996-12-10	McMurtry et al.	
79	5556240		1996-09-17	Almblad	
80	5555176		1996-09-10	Menhennett et al.	
81	5552992		1996-09-03	Hunter	
82	5545367		1996-08-13	Bae et al.	
83	5543103		1996-08-06	Hogan et al.	
84	5538374		1996-07-23	Cole et al.	
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86	5503785		1996-04-02	Crump et al.	
87	5497888		1996-03-12	Michaels et al.	
88	5496138		1996-03-05	Drori	
89	5485399		1996-01-16	Saigo et al.	
90	5443339		1995-08-22	Heredia et al.	
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92	5429202		1995-07-04	Millard et al.	
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	97	5363463		1994-11-08	Kleinerman	
	98	5360299		1994-11-01	Oliana	
	99	5351409		1994-10-04	Heredia	
	100	5330168		1994-07-19	Enomoto et al.	
	101	D348393		1994-07-05	Neitzke et al.	
	102	5314274		1994-05-24	Heredia et al.	
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	108	5293687		1994-03-15	Willoughby, Jr. et al.	
	109	5271698		1993-12-21	Heredia et al.	
	110	5259708		1993-11-09	Brice	
	111	5255199		1993-10-19	Barkman et al.	
	112	5244321		1993-09-14	Sopko	
	113	5229619		1993-07-20	Van Amstel	
	114	5201203		1993-04-13	Almblad	
	115	5192469		1993-03-09	Smalley et al.	
	116	5171112		1992-12-15	Roland	
	117	5167171		1992-12-01	Heredia	
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	119	5146689		1992-09-15	Roland	
	120	5144561		1992-09-01	Soper	
	121	5139246		1992-08-18	Yakou	
	122	5130064		1992-07-14	Smalley et al.	
	123	5128531		1992-07-07	Fadel	
	124	5127532		1992-07-07	Cimino et al.	
	125	5122018		1992-06-16	Zion	
	126	5119190		1992-06-02	Lemelson	
	127	5111056		1992-05-05	Yoshimura et al.	
	128	5096346		1992-03-17	Ueda	
	129	5094538		1992-03-10	Reedman et al.	

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	130	5088864		1992-02-18	Yanagida	
	131	5083759		1992-01-28	Pollak et al.	
	132	5058940		1991-10-22	Hart	
	133	5056204		1991-10-15	Bartschi	
	134	5043144		1991-08-27	Gordon et al.	
	135	5029459		1991-07-09	Almblad	
	136	4998349		1991-03-12	Killeen	
	137	4993291		1991-02-19	Sopko	
	138	4971489		1990-11-20	Womack	
	139	4969782		1990-11-13	Castain	
	140	4941335		1990-07-17	Allen	

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	141	4929843		1990-05-29	Chmielewski, Jr. et al.	
	142	4929129		1990-05-29	Dickson	
	143	4909892		1990-03-20	Quinn et al.	
	144	4899391		1990-02-06	Cimino et al.	
	145	4898504		1990-02-06	Agius et al.	
	146	4868559		1989-09-19	Pinnow	
	147	4853866		1989-08-01	Andrada Galan et al.	
	148	4848116		1989-07-18	Lizotte	
	149	4845764		1989-07-04	Ueda et al.	
	150	4839913		1989-06-13	Annis et al.	
	151	4845764		1989-07-04	Ueda et al.	

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152	4821393		1989-04-18	Spigarelli	
153	4821200		1989-04-11	Oberg	
154	4809341		1989-02-28	Matsui et al.	
155	4805224		1989-02-14	Koezuka et al.	
156	4803371		1989-02-07	Durland	
157	4783829		1988-11-08	Miyakawa et al.	
158	4780032		1988-10-25	Uyeda et al.	
159	4767110		1988-08-30	Yang	
160	4741652		1988-05-03	Marchal	
161	4717294		1988-01-05	Grasser	
162	4710808		1987-12-01	Hoogenboom et al.	

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163	4697300		1987-10-06	Warlop	
164	4687389		1987-08-18	Santii et al.	
165	4679331		1987-07-14	Koontz	
166	4677835		1987-07-07	Almblad	
167	4671711		1987-06-09	Steinbach et al.	
168	4666351		1987-05-19	Marchal	
169	4657448		1987-04-14	Alexander	
170	4656590		1987-04-07	Ace	
171	4653104		1987-03-24	Tamura	
172	4652765		1987-03-24	Nishihara	
173	4652738		1987-03-24	Nishihara et al.	

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	174	4651604		1987-03-24	Almblad et al.	
	175	4648585		1987-03-10	Yang	
	176	4647028		1987-03-03	Yang	
	177	4638567		1987-01-27	Leversee	
	178	4625107		1986-11-25	Planke	
	179	4614465		1986-09-30	Wu	
	180	4601185		1986-07-22	Sheldon	
	181	4592683		1986-06-03	Wu	
	182	4562759		1986-01-07	Schmitt	
	183	4558215		1985-12-10	Kaneko et al.	
	184	4557488		1985-12-10	Litherland	

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185	4553844		1985-11-19	Nakagawa et al.	
186	4551046		1985-11-05	Kinas	
187	4545569		1985-10-08	Schroder et al.	
188	4541760		1985-09-17	Zoueki	
189	4526498		1985-07-02	Fieldhouse	
190	4525908		1985-07-02	Bernstein	
191	4521142		1985-06-04	Juskevici	
192	4479673		1984-10-30	Inaba et al.	
193	4472056		1984-09-18	Nakagawa et al.	
194	4468994		1984-09-04	Lieptz	
195	4453432		1984-06-12	Widen	

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	196	4437150		1984-03-13	Dahlgren, Jr. et al.	
	197	4433487		1984-02-28	Roland	
	198	4432142		1984-02-21	Korsak	
	199	4426179		1984-01-17	Jefferson	
	200	4373414		1983-02-15	Agius	
	201	4359299		1982-11-16	Sagarian	
	202	4354780		1982-10-19	Bougiouris	
	203	4301373		1981-11-17	Sjodin	
	204	4300836		1981-11-17	Holmes, Jones F. et al.	
	205	4300170		1981-11-10	Sakamoto	
	206	4300042		1981-11-10	Oldenkamp et al.	

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	207	4294096		1981-10-13	Heimann	
	208	4283859		1981-08-18	Roland	
	209	4281379		1981-07-28	Austin	
	210	4256423		1981-03-17	Juskevic	
	211	4251173		1981-02-17	Saucedo	
	212	4257758		1981-01-06	Limacher	
	213	4233746		1980-11-18	Troillet	
	214	4223791		1980-09-23	Taggart	
	215	4188163		1980-02-12	Juskevic	
	216	4172632		1979-10-30	Holmes, Jr.	
	217	4171161		1979-10-16	Jung	

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	218	4166949		1979-09-04	Pold et al.	
	219	D251365		1979-03-20	Lipinski	
	220	4143582		1979-03-13	Heimann	
	221	4132151		1979-01-02	Weber	
	222	4121292		1978-10-17	Galanis et al.	
	223	4117763		1978-10-03	Uyeda	
	224	4105340		1978-08-08	Kempf	
	225	4092806		1978-06-06	Wich	
	226	4090303		1978-05-23	Uyeda	
	227	4088060		1978-05-09	Johns	
	228	4062261		1977-12-13	Stahl	

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	229	4051748		1977-10-04	Sherman	
	230	4023464		1977-05-17	Zion	
	231	4019415		1977-04-26	Wich	
	232	4012991		1977-03-22	Uyeda	
	233	3981214		1976-09-21	Wich	
	234	3978764		1976-09-07	Patriquin	
	235	3956968		1976-05-18	Crasnianski	
	236	3955179		1976-05-04	Planke	
	237	3945298		1976-03-23	Cockroft	
	238	3919920		1975-11-18	Schlage	
	239	3919589		1975-11-11	Hanak	

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240	3902382		1975-09-02	Lieptz	
241	3884121		1975-05-20	Agius	
242	3880047		1975-04-29	Dosier	
243	3870895		1975-03-11	Lax et al.	
244	3865011		1975-02-11	Patriquin	
245	3848235		1974-11-12	Lewis et al.	
246	3826555		1974-07-30	Matsumoto	
247	3810416		1974-05-14	Nelms, Jr.	
248	3807276		1974-04-30	Oliver	
249	3796130		1974-03-12	Gartner	
250	3795174		1974-03-05	Oliver et al.	

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251	3792639		1974-02-19	Richens et al.	
252	3773360		1973-11-20	Timbers	
253	3769865		1973-11-06	Kleist	
254	Re27665		1973-06-12	Spain	
255	3722341		1973-03-27	Hungerford, Jr. et al.	
256	3707999		1973-01-02	Coats	
257	3682041		1972-08-08	Essig	
258	3675536		1972-07-11	Hungerford, Jr. et al.	
259	3656402		1972-04-18	French	
260	3633451		1972-01-11	Lieptz	
261	3651573		1972-03-28	Kaplan	

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262	3625111		1971-12-07	Carlo et al.	
263	3602092		1971-08-31	Richens	
264	3599147		1971-08-10	Rogers et al.	
265	Re26848		1970-04-07	Simon	
266	3499366		1970-03-10	Spain	
267	3496636		1970-02-24	Lieptz	
268	3466747		1969-09-16	Patriquin et al.	
269	3457831		1969-07-29	Adler et al.	
270	3442174		1969-05-06	Weiner et al.	
271	3440906		1969-04-29	Allen	
272	3430535		1969-03-04	Haggstrom	

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273	3429207		1969-02-25	John	
274	3424056		1969-01-28	Stolove et al.	
275	3418882		1968-12-31	Brand	
276	3388619		1968-06-18	Schreiber et al.	
277	3323420		1967-06-06	Roxburgh	
278	3305100		1967-02-21	Barbee	
279	3286597		1966-11-22	Schwartz	
280	32856596		1966-11-22	Lieptz	
281	3276328		1966-10-04	Schreiber et al.	
282	3259022		1966-07-05	Vietorisz	
283	3257908		1966-06-28	Haggstrom	

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	284	3245149		1966-04-12	Haggstrom	
	285	3172969		1965-03-09	Haggstrom	
	286	3138999		1964-06-30	Haggstrom	
	287	3094039		1963-06-18	Spain	
	288	3053149		1962-09-11	Rossetti	
	289	2940183		1960-06-14	Fromberg	
	290	2929177		1960-03-22	Sheps	
	291	2860884		1958-11-18	Sloan et al.	
	292	2728251		1955-12-27	Turner	
	293	2707335		1955-05-03	Falk	
	294	2645978		1953-07-21	Sejarto et al.	

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	295	2622485		1952-12-23	Martellotti	
	296	2605294		1952-07-29	Barnhart	
	297	2582012		1952-01-08	Currier	
	298	2556577		1951-06-12	Drake	
	299	2499124		1950-02-28	Zipp et al.	
	300	2445041		1948-07-13	Scholz	

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2	EP1976656	EP	2014-10-29	Hy-Ko Products Company
3	EP0053730	EP	1981-10-31	Webb Service GmbH
4	EP0133091	EP	1985-02-13	Societe Anonyme H.K. France
5	EP0835720	EP	1998-04-15	Noran, S.L.
6	FR2499435	FR	1982-08-13	Firme August Borkey Nachfolger
7	GB2276106	GB	1994-09-21	Autokey (UK) Ltd.
8	H04-250911	JP	1992-09-07	Ishikawajima Harima Heavy Ind.
9	S63-311108	JP	1988-12-19	Kiki Kalihatsu Kogyo KK
10	S63-311109	JP	1988-12-19	Kiki Kalihatsu Kogyo KK
11	291113	MX	2007-01-23	Hy-Ko Products Company

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12	ES2017240	ES		1991-01-01	Areitio & Arteta Comunicad de		
13	CH673612	CH		1990-03-30	Hans Zulliger		
14	WO2012096685	WO		2012-07-19	Hy-Ko Products Company		
15	WO2007087389	WO		2007-08-02	Hy-Ko Products Company		
16	WO2005042196	WO		2005-05-12	Hy-Ko Products Company		
17	WO200201480	WO		2002-01-03	Almblad, Robert E.		
18	WO2001/057472	WO		2001-08-09	Machine Magic LLC		
19	WO1996/19309	WO		1996-06-27	Almblad, Robert E.		
20	WO1991/13535	WO		1991-09-05	ATS Automation Tooling Systems Inc.		
21	WO1990/03867	WO		1990-04-19	Silca S.P.A.		
22	JPS59201708	JP		1984-11-15	Tsugami Totsuki KK		

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	1	Chinese Office Action, Application No. 200780009675.0, Hy-Ko Products Company, December 4 2009.	
	2	Chinese Office Action, Application No. 201080024166.7, Hy-Ko Products Company, December 6, 2013.	
	3	Chinese Office Action, Application No. 201080024166.7, Hy-Ko Products Company, September 30, 2014.	
	4	Chinese Office Action, Application No. 201080024163.3, Hy-Ko Products Company, August 1, 2013.	
	5	Supplementary European Search Report, Application No. 07709849.9 - 1702/ 1976656, Hy-Ko Products Company, May 15, 2013.	
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	7	European Communication pursuant to Article 94(3) EPC, Application No. 10 770 489.2-1901, Hy-Ko Products, June 27, 2014.	
	8	Supplementary European Search Report, Application No. 10770489.2 - 1901/ 2424690, Hy-Ko Products, November 12, 2013.	
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12	Extended European Search Report, Application No. 12003030.9 - 2302, Hy-Ko Products Company, September 4, 2012.
13	European Communication pursuant to Article 94(3) EPC, Application No. 03 767 220.1 - 2201, Hy-Ko Products, August 18, 2010.
14	European Supplementary Search Report, Application No. 03767220.1 - 2201, Hy-Ko Products, July 18, 2007.
15	Mexican Office Action, Application No. MX/A/2011/011630, Hy-Ko Products, November 18, 2014.
16	Mexican Office Action, Application No. MX/A/2011/011630, Hy-Ko Products, April 28, 2014.
17	International Preliminary Report on Patentability, PCT/US2011/034564, Mutch, William R. et al., July 16, 2013.
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23	International Preliminary Report on Patentability, PCT/US2010/033421, Hy-Ko Products et al., November 1, 2011.
24	International Search Report and the Written Opinion of the International Searching Authority, PCT/US2010/033421, Hy-Ko Products, September 17, 2010.
25	Giuliani Productivity Through Flexibility, Multicode CCE-1, 2 pages.
26	Giuliani Productivity Through Flexibility, Multicode CCE-2, 3 pages.
27	FARZIN MOKHTARIAN and HIROSHI MURASE, Silhouette-Based Object Recognition through Curvature Scale Space, IEEE, Proceedings from Fourth International Conference on Computer Vision, 1993, pages 269-274.
28	HTISHAM KABIR, A Computer Vision System Using Fast, One Pass Algorithms, (Thesis), Graduate Division of the University of California, Davis, 1986 pages 1-164.
29	ROGER D. QUINN et al., Design of an Agile Manufacturing Workcell for Light Mechanical Applications, April, 1996, pages 858 - 863, Proceedings from the 1996 IEEE International Conference on Robotics and Automation, Minneapolis, Minnesota.
30	ANIL K. JAIN, Fundamentals of Digital Image Processing, Ch. 9, Image Analysis and Computer Vision, University of California, Davis, 1989, pages 342 - 430, Prentice Hall, Inc., Englewood Cliffs, NJ.
31	AMIR NOVINI, Fundamentals of Machine Vision Lighting, IEEE, Proceedings of Northcon 93 Electrical and Electronics Convention, 1993, pages 38 - 46.

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33	European Search Report for European Patent Application No. 12 00 3030, dated August 27, 2012.
34	International Preliminary Report on Patentability for International Patent Application No. PCT/US2011/034564, dated July 25, 2013.

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The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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Signature	/Mark J. Masterson/	Date (YYYY-MM-DD)	2018-03-14
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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. /M.M.E/~~

Doc code: IDS

PTO/SB/08a (01-10)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 07/31/2012. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	
	Filing Date	2018-03-14
	First Named Inventor	Chester O.D. Thompson
	Art Unit	
	Examiner Name	
	Attorney Docket Number	16223-00341

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	2430924		1947-11-18	Fowle et al.	
	2	2386816		1945-10-16	Scholz	
	3	2329269		1943-09-14	Jacobi	
	4	2325541		1943-07-27	Poole	
	5	2274012		1942-02-24	Swayze et al.	
	6	2176106		1939-10-17	Segal	
	7	2148668		1939-02-28	Yoskowitz et al.	
	8	2114597		1938-04-19	Goddard	

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Art Unit		
Examiner Name		
Attorney Docket Number		16223-00341

9	2105099		1938-01-11	Schuyler	
10	2098728		1937-11-09	McPhee	
11	2038949		1936-04-28	Mintz	
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15	1961516		1934-06-05	Hansen	
16	1948260		1934-02-20	Fowler	
17	1923164		1933-08-22	Roos	
18	1889461		1932-11-29	Hansen	
19	1848046		1932-03-01	Caron	

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Application Number		
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First Named Inventor	Chester O.D. Thompson	
Art Unit		
Examiner Name		
Attorney Docket Number		16223-00341

	20	1775921		1930-09-16	Williams	
	21	1752668		1930-04-01	Johnson	
	22	1750218		1930-03-11	Falk	
	23	1702488		1929-02-19	Baird	
	24	1674291		1928-06-19	Malone	
	25	1656295		1928-01-17	Schechter	
	26	1628637		1927-05-10	Shaw	
	27	1440459		1923-01-02	Greff	
	28	1390958		1921-09-13	Hulbert	
	29	1367280		1921-02-01	Reiges	
	30	1218653		1917-03-13	Heldrich	

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Attorney Docket Number		16223-00341

	31	1135676		1915-04-13	Engelbert	
	32	1081472		1913-12-16	Tucker	
	33	1059545		1913-04-22	Kunze	
	34	0943806		1909-12-21	Billings	
	35	0466044		1891-12-29	Jacobs	
	36	0288300		1883-11-13	Borowsky	
	37	0040480		1863-03-03	Hill	
	38	7890878		2011-02-15	Bass, et al.	

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U.S.PATENT APPLICATION PUBLICATIONS

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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	20110262240		2011-10-27	Mutch et al.	

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Art Unit		
Examiner Name		
Attorney Docket Number	16223-00341	

2	20090180664		2009-07-16	Efstathiades et al.	
3	20090074528		2009-03-19	Hadad	
4	20080252551		2008-10-16	Kubo et al.	
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Examiner Name		
Attorney Docket Number		16223-00341

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	14	20040024486		2004-02-05	Almblad et al.	
	15	20030205070		2003-11-06	Chaum	
	16	20030154135		2003-08-14	Covington et al.	
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	22	20010033781		2001-10-25	Wills et al.	
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First Named Inventor	Chester O.D. Thompson	
Art Unit		
Examiner Name		
Attorney Docket Number		16223-00341

	24	20140260809	A1	2014-09-08	Miller et al.	
	25	20100110380	A1	2010-05-06	Allred et al.	
	26	20100059484	A1	2010-03-11	Inoue et al.	

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FOREIGN PATENT DOCUMENTS

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							

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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		

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EXAMINER SIGNATURE

Examiner Signature	/MICHELLE M ENTEZARI/	Date Considered	12/21/2019

*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.

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Examiner Name	
Attorney Docket Number	16223-00341

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.

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STATEMENT BY APPLICANT**
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Application Number	
Filing Date	2018-03-14
First Named Inventor	Chester O.D. Thompson
Art Unit	
Examiner Name	
Attorney Docket Number	16223-00341

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	/Mark J. Masterson/	Date (YYYY-MM-DD)	2018-03-14
Name/Print	Mark J. Masterson	Registration Number	71886

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.**

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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.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/920,955	03/14/2018	Chester O.D. Thompson	16223-00341

CONFIRMATION NO. 2833

33772

MCDONALD HOPKINS LLC
600 Superior Avenue, East
Suite 2100
CLEVELAND, OH 44114-2653

PUBLICATION NOTICE



OC000000101097230

Title:KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING

Publication No.US-2018-0204089-A1

Publication Date:07/19/2018

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 Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, 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 <https://portal.uspto.gov/pair/PublicPair>. 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 Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application:	Chester O.D. Thompson	Group Art Unit:	2665
Serial No.:	15/920,955	Examiner:	Michelle M. Hausmann
Filing Date:	March 14, 2018	Docket No.:	16223-00341
		Confirmation No.:	2833

Title: KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

VOLUNTARY AMENDMENT

This voluntary amendment is submitted before the issuance of an office action by the USPTO wherein no new matter is added. Applicant submits that the claims presented herein replace the existing claims and be entered for prosecution on the merits. Applicant believes no additional fees are due; however, if any additional fees are required for this correspondence, please charge such fees to our Deposit Account No. 13-0265.

Electronic Acknowledgement Receipt	
EFS ID:	32723372
Application Number:	15920955
International Application Number:	
Confirmation Number:	2833
Title of Invention:	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING
First Named Inventor/Applicant Name:	Chester O.D. Thompson
Customer Number:	33772
Filer:	Mark Jason Masterson/danielle mueller
Filer Authorized By:	Mark Jason Masterson
Attorney Docket Number:	16223-00341
Receipt Date:	25-MAY-2018
Filing Date:	14-MAR-2018
Time Stamp:	09:15:59
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		7423556.pdf	88274	yes	5
			f5b8a513bde17f42f1a8c7cf420d96e05e320b37		

Multipart Description/PDF files in .zip description			
Document Description		Start	End
Applicant Arguments/Remarks Made in an Amendment		5	5
Claims		2	4
Preliminary Amendment		1	1

Warnings:

Information:

Total Files Size (in bytes):	88274

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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.

CONCLUSION

This voluntary amendment is being filed electronically on May 25, 2018 before the receipt of any office action from the USPTO. Applicant respectfully requests that claims 1-20 be canceled and that claims 21-39 be entered for prosecution.

Respectfully submitted,

Date: May 25, 2018

/Mark J. Mastetson/

Mark J. Masterson, Reg. No. 71,886
McDonald Hopkins LLC
600 Superior Avenue, E.
Suite 2100
Cleveland, OH 44114-2653
(216) 348-5400

CLAIMS

What is claimed is:

1. 1-- 20. (Canceled)

21. (New) A key identification system comprising:

an imaging system including a first camera configured to capture a first image of a master key and a second camera configured to capture a second image of said master key, said first image different than said second image;

a logic configured to map data points from said first image to corresponding data points from said second image to determine characteristics of a contour of said master key; and

wherein said logic compares said characteristics of said contour with characteristics of known key blanks to determine the likelihood of a match between said master key and a known key blank.

22. (New) The key identification system of claim 21, wherein said characteristics of said contour includes outline data wherein said outline data includes a plurality of data points.

23. (New) The key identification system of claim 22, wherein said plurality of data points is selectively adjustable along an interval to adjust accuracy of groove identification.

24. (New) The key identification system of claim 21, wherein said imaging system further comprises a crop box for limiting the image of the master key, wherein said crop box defines the outer periphery of at least said first and second images of said master key.

25. (New) The key identification system of claim 21, wherein said logic includes a database containing data related to characteristics of grooves of known key blanks.

26. (New) The key identification system of claim 21 wherein said logic is configured to generate tolerance and/or correlation values to determine the likelihood that the comparison yields a match.

27. (New) The key identification system of claim 21, wherein said first image is a digital image.
28. (New) The key identification system of claim 21, wherein said second image comprises a silhouette of a blade of said master key.
29. (New) The key identification system of claim 21 wherein said second image comprises a silhouette of a tip of said master key.
30. (New) The key identification system of claim 21, wherein said characteristics of said contour are determined based on image data from at least said two or more views of said master key.
31. (New) The key identification system of claim 30, wherein said logic calculates the geometry of the contour as though a tip of said master key were squarely cut based on data from at least said two or more views of said master key.
32. (New) The key identification system of claim 21 further comprising a key holder configured to hold said master key.
33. (New) The key identification system of claim 32, wherein said key holder includes a clamp.
34. (New) The key identification system of claim 21, wherein one of said views of said master key includes a view from above the master key blade of a groove in the bottom of said blade.
35. (New) The key identification system of claim 21, wherein one of said views of said master key includes a view from an angle between perpendicular and parallel to the blade of said master key and not including perpendicular or parallel to the blade of said master key,
36. (New) The key identification system of claim 21, wherein the logic is configured to shift data related to said characteristics of said contour to compare with said known key blank characteristics.

37. (New) The key identification system of claim 21, wherein said logic includes a tolerance range for each characteristic of said master key to determine whether a master key passes or fails to match a known key blank.
38. (New) The key identification system of claim 21, wherein said logic is configured to generate a series of comparisons to compensate for registration errors.
39. (New) The key identification system of claim 21, wherein said logic includes at least one roll constant used to adjust the plurality of data points to increase accuracy of a match with a known key blank.

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 15/920,955		Filing Date 03/14/2018		☐ To be Mailed						
ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO														
APPLICATION AS FILED – PART I														
(Column 1)		(Column 2)												
FOR		NUMBER FILED		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														
(Column 1)		(Column 2)		(Column 3)										
AMENDMENT	05/25/2018		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))		* 20		Minus		** 20		= 0		X \$50 =		0	
	Independent (37 CFR 1.16(h))		* 1		Minus		*** 3		= 0		X \$230 =		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			
(Column 1)		(Column 2)		(Column 3)										
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		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.														

LDRC
ANDREW JAMES JR

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.**

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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	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/920,955	03/14/2018	3722	785	16223-00341	20	1

CONFIRMATION NO. 2833

FILING RECEIPT



000000098883810

33772
MCDONALD HOPKINS LLC
600 Superior Avenue, East
Suite 2100
CLEVELAND, OH 44114-2653

Date Mailed: 04/12/2018

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Chester O.D. Thompson, Painesville, OH;
William R. Mutch, North Ridgeville, OH;

Applicant(s)

HY-KO PRODUCTS COMPANY, Northfield, OH

Power of Attorney: The patent practitioners associated with Customer Number 33772

Domestic Priority data as claimed by applicant

This application is a CON of 15/351,634 11/15/2016 PAT 9934448
which is a CON of 14/162,157 01/23/2014 PAT 9514385
which is a CON of 12/772,709 05/03/2010 PAT 8644619
which claims benefit of 61/275,654 09/01/2009
and claims benefit of 61/215,152 05/01/2009

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 04/10/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/920,955**

Projected Publication Date: 07/19/2018

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING

Preliminary Class

409

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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NOT GRANTED

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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 U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 15/920,955	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)	RATE(\$)	FEE(\$)	
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	75	N/A		
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	330	N/A		
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	380	N/A		
TOTAL CLAIMS (37 CFR 1.16(j))	20	minus 20 = *	x 50 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1	minus 3 = *	x 230 =	0.00	OR		
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).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
			TOTAL	785		TOTAL	
* If the difference in column 1 is less than zero, enter "0" in column 2.							
APPLICATION AS AMENDED - PART II							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =
	Application Size Fee (37 CFR 1.16(s))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
			TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =	OR	x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =	OR	x =
	Application Size Fee (37 CFR 1.16(s))					OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR	
			TOTAL ADD'L FEE		OR	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 found in the appropriate box in column 1.							

Doc Code: PA..

Document Description: Power of Attorney

PTO/AIA/82B (07-13)

Approved for use through 11/30/2014. OMB 0651-0051

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number

Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)



I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

33772

OR



I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:



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OR



The address associated with Customer Number:

OR

Firm or
Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Hy-Ko Products Company



Inventor or Joint Inventor (title not required below)



Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)



Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)



Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Date (Optional)

4/19/17

Name

Michael A. Bass

Title

President

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of

forms are submitted.

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The information provided by you in this form will be subject to the following routine uses:

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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).
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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.

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

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	
	Filing Date	2018-03-14
	First Named Inventor	Chester O.D. Thompson
	Art Unit	
	Examiner Name	
	Attorney Docket Number	16223-00341

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	8644619		2014-02-04	Thompson et al.	
	2	8634655		2014-01-21	Thompson et al.	
	3	8585029		2013-11-19	Ryai, Sr.	
	4	8532809		2013-09-10	Freeman	
	5	8128322		2012-03-06	Bass et al.	
	6	7918629		2011-04-05	Belflower et al.	
	7	7891919		2011-02-22	Bass et al.	
	8	7643685		2010-01-05	Miller	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		2018-03-14
	First Named Inventor	Chester O.D. Thompson	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		16223-00341

	9	7484446		2009-03-02	Gula	
	10	7214011		2007-05-08	Ryai, Sr. et al.	
	11	7163364		2007-01-16	Foscan et al.	
	12	7114894		2006-10-03	Mueller et al.	
	13	7114436		2006-10-03	Mueller	
	14	7111894		2006-09-26	Kora et al.	
	15	7010498		2006-03-07	Berstis	
	16	6965911		2005-11-15	Coffman et al.	
	17	6959862		2005-11-01	Neumark	
	18	6895100		2005-05-17	Pacenzia et al.	
	19	6839451		2005-01-04	Campbell et al.	

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	First Named Inventor	Chester O.D. Thompson	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		16223-00341

	20	6839449		2005-01-04	Campbell et al.	
	21	6836553		2004-12-28	Campbell et al.	
	22	6817814		2004-11-16	Mueller	
	23	6801829		2004-10-05	Kawai	
	24	6711557		2004-03-23	Palaniappan	
	25	6687565		2004-02-03	Wetterlin et al.	
	26	6647308		2003-11-11	Prejean	
	27	6641339		2003-11-04	Chies et al.	
	28	6612142		2003-09-02	Capwell	
	29	6602030		2003-08-05	Markbreit	
	30	6588995		2003-07-08	Wills et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		2018-03-14
	First Named Inventor	Chester O.D. Thompson	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		16223-00341

	31	6543972		2003-04-08	Cimino	
	32	6478515		2002-11-12	Mueller	
	33	6449381		2002-09-10	Yanovsky et al.	
	34	6415931		2002-07-09	Mueller	
	35	6406227		2002-06-18	Titus et al.	
	36	D455104		2002-04-02	Hillman et al.	
	37	6321430		2001-11-27	Goldman et al.	
	38	6243960		2001-06-12	Andrews et al.	
	39	6186711		2001-02-13	Mueller	
	40	6185311		2001-02-06	Yanovsky et al.	
	41	6179531		2001-01-30	Jaw	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		2018-03-14
	First Named Inventor	Chester O.D. Thompson	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		16223-00341

	42	6175638		2001-01-16	Yanovsky	
	43	6152662		2000-11-28	Titus et al.	
	44	6094953		2000-08-01	Evans	
	45	6082580		2000-07-04	Mueller et al.	
	46	6065911		2000-05-23	Almblad et al.	
	47	6064747		2000-05-16	Wills et al.	
	48	6059495		2000-05-09	Mueller et al.	
	49	6053677		2000-04-25	Juchinewicz	
	50	5997795		1999-12-07	Danforth et al.	
	51	5997224		1999-12-07	Beauregard et al.	
	52	5984597		1999-11-16	Chen	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		2018-03-14
	First Named Inventor	Chester O.D. Thompson	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		16223-00341

	53	5982491		1999-11-09	Breyer et al.	
	54	5966457		1999-10-12	Lemelson	
	55	5964554		1999-10-12	Drori	
	56	5940229		1999-08-17	Baumgarten	
	57	5926388		1999-07-20	Kimbrough et al.	
	58	5908273		1999-06-01	Titus et al.	
	59	5906365		1999-05-25	Wu	
	60	5886775		1999-03-23	Houser et al.	
	61	5855836		1999-01-05	Leyden et al.	
	62	5807042		1998-09-15	Almblad et al.	
	63	5771176		1998-06-23	Froehlich et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		2018-03-14
	First Named Inventor	Chester O.D. Thompson	
	Art Unit		
	Examiner Name		
	Attorney Docket Number		16223-00341

	64	5764156		1998-06-09	Chaloux	
	65	5739766		1998-04-14	Chaloux	
	66	5711643		1998-01-27	Parr et al.	
	67	5771176		1998-06-23	Froehlich et al.	
	68	5677522		1997-10-14	Rice et al.	
	69	5676504		1997-10-14	Mueller et al.	
	70	5671523		1997-09-30	Juchinewicz	
	71	RE35518		1997-05-27	Sussina	
	72	5660509		1997-08-26	Cole et al.	
	73	5630332		1997-05-20	Aldieri et al.	
	74	5617323		1997-04-01	Stansberry et al.	

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	75	5607267		1997-03-04	Heredia et al.	
	76	5594652		1997-01-14	Penn et al.	
	77	5592728		1997-01-14	Susnjara	
	78	5583443		1996-12-10	McMurtry et al.	
	79	5556240		1996-09-17	Almblad	
	80	5555176		1996-09-10	Menhennett et al.	
	81	5552992		1996-09-03	Hunter	
	82	5545367		1996-08-13	Bae et al.	
	83	5543103		1996-08-06	Hogan et al.	
	84	5538374		1996-07-23	Cole et al.	
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	86	5503785		1996-04-02	Crump et al.	
	87	5497888		1996-03-12	Michaels et al.	
	88	5496138		1996-03-05	Drori	
	89	5485399		1996-01-16	Saigo et al.	
	90	5443339		1995-08-22	Heredia et al.	
	91	5441369		1995-08-15	Foscan et al.	
	92	5429202		1995-07-04	Millard et al.	
	93	5416591		1995-05-16	Yoshimura et al.	
	94	5393967		1995-02-28	Rice et al.	
	95	5382784		1995-01-17	Eberhardt	
	96	5365812		1994-11-22	Harnden	

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	97	5363463		1994-11-08	Kleinerman	
	98	5360299		1994-11-01	Oliana	
	99	5351409		1994-10-04	Heredia	
	100	5330168		1994-07-19	Enomoto et al.	
	101	D348393		1994-07-05	Neitzke et al.	
	102	5314274		1994-05-24	Heredia et al.	
	103	5311758		1994-05-17	Neitzke et al.	
	104	5311756		1994-05-17	Villani	
	105	5311286		1994-05-10	Pike	
	106	5308360		1994-05-03	Neitzke et al.	
	107	5307151		1994-04-26	Hof et al.	

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	108	5293687		1994-03-15	Willoughby, Jr. et al.	
	109	5271698		1993-12-21	Heredia et al.	
	110	5259708		1993-11-09	Brice	
	111	5255199		1993-10-19	Barkman et al.	
	112	5244321		1993-09-14	Sopko	
	113	5229619		1993-07-20	Van Amstel	
	114	5201203		1993-04-13	Almblad	
	115	5192469		1993-03-09	Smalley et al.	
	116	5171112		1992-12-15	Roland	
	117	5167171		1992-12-01	Heredia	
	118	5165315		1992-11-24	Terada	

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	119	5146689		1992-09-15	Roland	
	120	5144561		1992-09-01	Soper	
	121	5139246		1992-08-18	Yakou	
	122	5130064		1992-07-14	Smalley et al.	
	123	5128531		1992-07-07	Fadel	
	124	5127532		1992-07-07	Cimino et al.	
	125	5122018		1992-06-16	Zion	
	126	5119190		1992-06-02	Lemelson	
	127	5111056		1992-05-05	Yoshimura et al.	
	128	5096346		1992-03-17	Ueda	
	129	5094538		1992-03-10	Reedman et al.	

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	130	5088864		1992-02-18	Yanagida	
	131	5083759		1992-01-28	Pollak et al.	
	132	5058940		1991-10-22	Hart	
	133	5056204		1991-10-15	Bartschi	
	134	5043144		1991-08-27	Gordon et al.	
	135	5029459		1991-07-09	Almblad	
	136	4998349		1991-03-12	Killeen	
	137	4993291		1991-02-19	Sopko	
	138	4971489		1990-11-20	Womack	
	139	4969782		1990-11-13	Castain	
	140	4941335		1990-07-17	Allen	

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	141	4929843		1990-05-29	Chmielewski, Jr. et al.	
	142	4929129		1990-05-29	Dickson	
	143	4909892		1990-03-20	Quinn et al.	
	144	4899391		1990-02-06	Cimino et al.	
	145	4898504		1990-02-06	Agius et al.	
	146	4868559		1989-09-19	Pinnow	
	147	4853866		1989-08-01	Andrada Galan et al.	
	148	4848116		1989-07-18	Lizotte	
	149	4845764		1989-07-04	Ueda et al.	
	150	4839913		1989-06-13	Annis et al.	
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	152	4821393		1989-04-18	Spigarelli	
	153	4821200		1989-04-11	Oberg	
	154	4809341		1989-02-28	Matsui et al.	
	155	4805224		1989-02-14	Koezuka et al.	
	156	4803371		1989-02-07	Durland	
	157	4783829		1988-11-08	Miyakawa et al.	
	158	4780032		1988-10-25	Uyeda et al.	
	159	4767110		1988-08-30	Yang	
	160	4741652		1988-05-03	Marchal	
	161	4717294		1988-01-05	Grasser	
	162	4710808		1987-12-01	Hoogenboom et al.	

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	163	4697300		1987-10-06	Warlop	
	164	4687389		1987-08-18	Santii et al.	
	165	4679331		1987-07-14	Koontz	
	166	4677835		1987-07-07	Almblad	
	167	4671711		1987-06-09	Steinbach et al.	
	168	4666351		1987-05-19	Marchal	
	169	4657448		1987-04-14	Alexander	
	170	4656590		1987-04-07	Ace	
	171	4653104		1987-03-24	Tamura	
	172	4652765		1987-03-24	Nishihara	
	173	4652738		1987-03-24	Nishihara et al.	

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	174	4651604		1987-03-24	Almblad et al.	
	175	4648585		1987-03-10	Yang	
	176	4647028		1987-03-03	Yang	
	177	4638567		1987-01-27	Leversee	
	178	4625107		1986-11-25	Planke	
	179	4614465		1986-09-30	Wu	
	180	4601185		1986-07-22	Sheldon	
	181	4592683		1986-06-03	Wu	
	182	4562759		1986-01-07	Schmitt	
	183	4558215		1985-12-10	Kaneko et al.	
	184	4557488		1985-12-10	Litherland	

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	185	4553844		1985-11-19	Nakagawa et al.	
	186	4551046		1985-11-05	Kinas	
	187	4545569		1985-10-08	Schroder et al.	
	188	4541760		1985-09-17	Zoueki	
	189	4526498		1985-07-02	Fieldhouse	
	190	4525908		1985-07-02	Bernstein	
	191	4521142		1985-06-04	Juskevici	
	192	4479673		1984-10-30	Inaba et al.	
	193	4472056		1984-09-18	Nakagawa et al.	
	194	4468994		1984-09-04	Lieptz	
	195	4453432		1984-06-12	Widen	

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	196	4437150		1984-03-13	Dahlgren, Jr. et al.	
	197	4433487		1984-02-28	Roland	
	198	4432142		1984-02-21	Korsak	
	199	4426179		1984-01-17	Jefferson	
	200	4373414		1983-02-15	Agius	
	201	4359299		1982-11-16	Sagarian	
	202	4354780		1982-10-19	Bougiouris	
	203	4301373		1981-11-17	Sjodin	
	204	4300836		1981-11-17	Holmes, Jones F. et al.	
	205	4300170		1981-11-10	Sakamoto	
	206	4300042		1981-11-10	Oldenkamp et al.	

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	207	4294096		1981-10-13	Heimann	
	208	4283859		1981-08-18	Roland	
	209	4281379		1981-07-28	Austin	
	210	4256423		1981-03-17	Juskevic	
	211	4251173		1981-02-17	Saucedo	
	212	4257758		1981-01-06	Limacher	
	213	4233746		1980-11-18	Troillet	
	214	4223791		1980-09-23	Taggart	
	215	4188163		1980-02-12	Juskevic	
	216	4172632		1979-10-30	Holmes, Jr.	
	217	4171161		1979-10-16	Jung	

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	218	4166949		1979-09-04	Pold et al.	
	219	D251365		1979-03-20	Lipinski	
	220	4143582		1979-03-13	Heimann	
	221	4132151		1979-01-02	Weber	
	222	4121292		1978-10-17	Galanis et al.	
	223	4117763		1978-10-03	Uyeda	
	224	4105340		1978-08-08	Kempf	
	225	4092806		1978-06-06	Wich	
	226	4090303		1978-05-23	Uyeda	
	227	4088060		1978-05-09	Johns	
	228	4062261		1977-12-13	Stahl	

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	229	4051748		1977-10-04	Sherman	
	230	4023464		1977-05-17	Zion	
	231	4019415		1977-04-26	Wich	
	232	4012991		1977-03-22	Uyeda	
	233	3981214		1976-09-21	Wich	
	234	3978764		1976-09-07	Patriquin	
	235	3956968		1976-05-18	Crasnianski	
	236	3955179		1976-05-04	Planke	
	237	3945298		1976-03-23	Cockroft	
	238	3919920		1975-11-18	Schlage	
	239	3919589		1975-11-11	Hanak	

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	240	3902382		1975-09-02	Lieptz	
	241	3884121		1975-05-20	Agius	
	242	3880047		1975-04-29	Dosier	
	243	3870895		1975-03-11	Lax et al.	
	244	3865011		1975-02-11	Patriquin	
	245	3848235		1974-11-12	Lewis et al.	
	246	3826555		1974-07-30	Matsumoto	
	247	3810416		1974-05-14	Nelms, Jr.	
	248	3807276		1974-04-30	Oliver	
	249	3796130		1974-03-12	Gartner	
	250	3795174		1974-03-05	Oliver et al.	

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	251	3792639		1974-02-19	Richens et al.	
	252	3773360		1973-11-20	Timbers	
	253	3769865		1973-11-06	Kleist	
	254	Re27665		1973-06-12	Spain	
	255	3722341		1973-03-27	Hungerford, Jr. et al.	
	256	3707999		1973-01-02	Coats	
	257	3682041		1972-08-08	Essig	
	258	3675536		1972-07-11	Hungerford, Jr. et al.	
	259	3656402		1972-04-18	French	
	260	3633451		1972-01-11	Lieptz	
	261	3651573		1972-03-28	Kaplan	

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	262	3625111		1971-12-07	Carlo et al.	
	263	3602092		1971-08-31	Richens	
	264	3599147		1971-08-10	Rogers et al.	
	265	Re26848		1970-04-07	Simon	
	266	3499366		1970-03-10	Spain	
	267	3496636		1970-02-24	Lieptz	
	268	3466747		1969-09-16	Patriquin et al.	
	269	3457831		1969-07-29	Adler et al.	
	270	3442174		1969-05-06	Weiner et al.	
	271	3440906		1969-04-29	Allen	
	272	3430535		1969-03-04	Haggstrom	

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	273	3429207		1969-02-25	John	
	274	3424056		1969-01-28	Stolove et al.	
	275	3418882		1968-12-31	Brand	
	276	3388619		1968-06-18	Schreiber et al.	
	277	3323420		1967-06-06	Roxburgh	
	278	3305100		1967-02-21	Barbee	
	279	3286597		1966-11-22	Schwartz	
	280	32856596		1966-11-22	Lieptz	
	281	3276328		1966-10-04	Schreiber et al.	
	282	3259022		1966-07-05	Vietorisz	
	283	3257908		1966-06-28	Haggstrom	

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	284	3245149		1966-04-12	Haggstrom	
	285	3172969		1965-03-09	Haggstrom	
	286	3138999		1964-06-30	Haggstrom	
	287	3094039		1963-06-18	Spain	
	288	3053149		1962-09-11	Rossetti	
	289	2940183		1960-06-14	Fromberg	
	290	2929177		1960-03-22	Sheps	
	291	2860884		1958-11-18	Sloan et al.	
	292	2728251		1955-12-27	Turner	
	293	2707335		1955-05-03	Falk	
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	295	2622485		1952-12-23	Martellotti	
	296	2605294		1952-07-29	Barnhart	
	297	2582012		1952-01-08	Currier	
	298	2556577		1951-06-12	Drake	
	299	2499124		1950-02-28	Zipp et al.	
	300	2445041		1948-07-13	Scholz	

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	2	EP1976656	EP		2014-10-29	Hy-Ko Products Company		
	3	EP0053730	EP		1981-10-31	Webb Service GmbH		
	4	EP0133091	EP		1985-02-13	Societe Anonyme H.K. France		
	5	EP0835720	EP		1998-04-15	Noran, S.L.		
	6	FR2499435	FR		1982-08-13	Firme August Borkey Nachfolger		
	7	GB2276106	GB		1994-09-21	Autokey (UK) Ltd.		
	8	H04-250911	JP		1992-09-07	Ishikawajima Harima Heavy Ind.		
	9	S63-311108	JP		1988-12-19	Kiki Kalihatsu Kogyo KK		
	10	S63-311109	JP		1988-12-19	Kiki Kalihatsu Kogyo KK		
	11	291113	MX		2007-01-23	Hy-Ko Products Company		

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	12	ES2017240	ES		1991-01-01	Areitio & Arteta Comunicad de		
	13	CH673612	CH		1990-03-30	Hans Zulliger		
	14	WO2012096685	WO		2012-07-19	Hy-Ko Products Company		
	15	WO2007087389	WO		2007-08-02	Hy-Ko Products Company		
	16	WO2005042196	WO		2005-05-12	Hy-Ko Products Company		
	17	WO200201480	WO		2002-01-03	Almblad, Robert E.		
	18	WO2001/057472	WO		2001-08-09	Machine Magic LLC		
	19	WO1996/19309	WO		1996-06-27	Almblad, Robert E.		
	20	WO1991/13535	WO		1991-09-05	ATS Automation Tooling Systems Inc.		
	21	WO1990/03867	WO		1990-04-19	Silca S.P.A.		
	22	JPS59201708	JP		1984-11-15	Tsugami Totsuki KK		

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	Examiner Name		
	Attorney Docket Number		16223-00341

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13	European Communication pursuant to Article 94(3) EPC, Application No. 03 767 220.1 - 2201, Hy-Ko Products, August 18, 2010.
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18	International Search Report and the Written Opinion of the International Searching Authority, PCT/US2011/034564, Hy-Ko Products Company, July 15, 2011.
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See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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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	/Mark J. Masterson/	Date (YYYY-MM-DD)	2018-03-14
Name/Print	Mark J. Masterson	Registration Number	71886

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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.
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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	2430924		1947-11-18	Fowle et al.	
	2	2386816		1945-10-16	Scholz	
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	1	20110262240		2011-10-27	Mutch et al.	

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(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 16223-00178P	FOR FURTHER ACTION		See item 4 below
International application No. PCT/US2011/034564	International filing date (<i>day/month/year</i>) 29 April 2011 (29.04.2011)	Priority date (<i>day/month/year</i>) 14 January 2011 (14.01.2011)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant MUTCH, William R.			

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																								
2.	This REPORT consists of a total of 5 sheets, including this cover sheet. In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																								
3.	This report contains indications relating to the following items: <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; text-align: center;">☒</td> <td style="width: 30%;">Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;">☒</td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	☒	Box No. I	Basis of the report	☐	Box No. II	Priority	☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	☐	Box No. IV	Lack of unity of invention	☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	☐	Box No. VI	Certain documents cited	☐	Box No. VII	Certain defects in the international application	☐	Box No. VIII	Certain observations on the international application
☒	Box No. I	Basis of the report																							
☐	Box No. II	Priority																							
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☐	Box No. VI	Certain documents cited																							
☐	Box No. VII	Certain defects in the international application																							
☐	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Date of issuance of this report 16 July 2013 (16.07.2013)</td> </tr> <tr> <td style="padding: 2px;"> Authorized officer Simin Baharlou </td> </tr> </table> e-mail: pt09.pct@wipo.int	Date of issuance of this report 16 July 2013 (16.07.2013)	Authorized officer Simin Baharlou
Date of issuance of this report 16 July 2013 (16.07.2013)			
Authorized officer Simin Baharlou			

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: DAVID CUPAR
C/O MCDONALD HOPKINS LLC
600 SUPERIOR AVENUE, E. STE. 2100
CLEVELAND, OH 44114

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing (day/month/year) 15 JUL 2011	
Applicant's or agent's file reference 16223-00178P	FOR FURTHER ACTION See paragraph 2 below
International application No. PCT/US2011/034564	International filing date (day/month/year) 29 April 2011
Priority date (day/month/year) 14 January 2011	
International Patent Classification (IPC) or both national classification and IPC IPC(8) - B23C 3/35 (2011.01) USPC - 409/81	
Applicant HY-KO PRODUCTS COMPANY	

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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	Date of completion of this opinion 08 July 2011	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2009)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITYInternational application No.
PCT/US2011/034564

Box No. 1 Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
 - a. (means)
 - ☐ on paper
 - ☐ in electronic form
 - b. (time)
 - ☐ in the international application as filed
 - ☐ together with the international application in electronic form
 - ☐ subsequently to this Authority for the purposes of search
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2011/034564

Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	7, 9-10, 13, 21, 23-24	YES
	Claims	1-6, 8, 11-12, 14-20, 22, 25-28	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-28	NO
Industrial applicability (IA)	Claims	1-28	YES
	Claims	None	NO
2. Citations and explanations:			
Claims 1-6, 8, 11-12, 14-20, 22, 25-28 lack novelty under PCT Article 33(2) as being anticipated by Bass et al. Referring to Claim 1, Bass et al. disclose a key duplicating machine comprising a key load position to receive a key (Para. [0048]), an antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), configured to communicate with a key located at said key load position (Para. [0061]), and a cutting member (Fig. 8, Left and right cutting wheels 60, 62), configured to cut a key pattern into a key blank at said key load position (Para. [0066]). Referring to Claim 2, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), is configured to transmit data to said key (Paras. [0061], [0065]). Referring to Claim 3, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), is configured to receive data from said key (Para. [0061] - regarding the logic may make direct comparisons between physical dimensions of known key blanks 24 and the features of the master key 22). Referring to Claim 4, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said key is a master key (Fig. 1, master key 22). Referring to Claim 5, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said key is a key blank (Fig. 4b key blank 24). Referring to Claim 6, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said key includes a microchip embedded therein (Para. [0093]). Referring to Claim 8, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose further comprising an outer shell (Fig. 1, outer shell 12), having an opening positioned about said key load position (Fig. 1, and Para. [0046]). Referring to Claim 11, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said key load position comprises a base (Fig. 2, base 16), and a door clamp (Fig. 2, door clamp 14). Referring to Claim 12, Bass et al. disclose a key duplicating machine as in Claim 8, and further disclose wherein said door clamp (Fig. 2, door clamp 14), is movable with respect to said base (Fig. 2, base 16, and Para. [0046]). Referring to Claim 14, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said cutting member (Fig. 8, Left and right cutting wheels 60, 62), is a cutting wheel (Para. [0066]). Referring to Claim 15, Bass et al. disclose a key duplicating machine comprising a key load position to receive a key (Para. [0048]), an antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), configured to communicate with a key located at said key load position (Para. [0061]), and an imaging system (Fig. 6, optical imaging device 50), configured to capture data related to said key at said key load position (Para. [0056]). Referring to Claim 16, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), is configured to transmit data to said key (Paras. [0061], [0065]). Referring to Claim 17, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), is configured to receive data from said key (Para. [0061] - regarding the logic may make direct comparisons between physical dimensions of known key blanks 24 and the features of the master key 22).			

Form PCT/ISA/237 (Box No. V) (July 2009)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2011/034564

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Referring to Claim 18, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said key is a master key (Fig. 1, master key 22).

Referring to Claim 19, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said key is a key blank (Fig. 4b key blank 24).

Referring to Claim 20, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said key includes a microchip embedded therein (Para. [0093]).

Referring to Claim 22, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose further comprising an outer shell (Fig. 1, outer shell 12), having an opening positioned about said key load position (Fig. 1, and Para. [0046]).

Referring to Claim 25, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said key load position comprises a base (Fig. 2, base 16), and a door clamp (Fig. 2, door clamp 14).

Referring to Claim 26, Bass et al. disclose a key duplicating machine as in Claim 25, and further disclose wherein said door clamp (Fig. 2, door clamp 14), is movable with respect to said base (Fig. 2, base 16, and Para. [0046]).

Referring to Claim 27, Bass et al. disclose a key duplicating machine as in Claim 25, and further disclose further comprising at least one lever (Fig. 2, handle 18), configured to actuate movement of said door clamp (Para. [0046]).

Referring to Claim 28, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said imaging system (Fig. 6, optical imaging device 50), includes a camera (Para. [0056]).

Claims 7, 21 lack an inventive step under PCT Article 33(3) as being obvious over Bass et al. in view of Kubo et al.

Referring to Claim 7, Bass et al. disclose all the limitations of Claim 1, but do not disclose wherein said antenna comprises at least one pair of windings. However, Kubo et al. teach a coil antenna and portable electronic apparatus comprising wherein an antenna (Fig. 2, antenna 100), comprises at least one pair of windings (Fig. 2, windings 2A, 2B). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an antenna comprise at least one pair of windings as taught by Kubo et al. with the invention of Bass et al., for the purpose of customizing the shape of the antenna.

Referring to Claim 21, Bass et al. disclose all the limitations of Claim 15, but do not disclose wherein said antenna comprises at least one pair of windings. However, Kubo et al. teach a coil antenna and portable electronic apparatus comprising wherein an antenna (Fig. 2, antenna 100), comprises at least one pair of windings (Fig. 2, windings 2A, 2B). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an antenna comprise at least one pair of windings as taught by Kubo et al. with the invention of Bass et al., for the purpose of customizing the shape of the antenna.

Claims 9-10, 13, 23-24 lack an inventive step under PCT Article 33(3) as being obvious over Bass et al. in view of Swayze et al.

Referring to Claim 9, Bass et al. disclose all the limitations of Claim 5, but do not disclose wherein said opening is circular. However, Swayze et al. teach an antenna comprising wherein an opening is circular (Fig. 3, and Pg. 1, Col. 2, Lns. 19-27). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an opening circular as taught by Swayze et al. with the invention of Bass et al., for the purpose of allowing the key into a slot.

Referring to Claim 10, Bass et al. disclose all the limitations of Claim 5, but do not disclose wherein said antenna is wound about said opening. However, Swayze et al. teach an antenna comprising wherein an antenna is wound about an opening (Fig. 3, and Pg. 1, Col. 2, Lns. 46-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an antenna wound about said opening as taught by Swayze et al. with the invention of Bass et al., for the purpose of receiving clearer reception.

Referring to Claim 13, Bass et al. in view of Swayze et al. disclose all the limitations of Claim 9, and Bass et al. further disclose further comprising at least one lever (Fig. 2, handle 18), configured to actuate movement of said door clamp (Para. [0046]).

Referring to Claim 23, Bass et al. disclose all the limitations of Claim 22, but do not disclose wherein said opening is circular. However, Swayze et al. teach an antenna comprising wherein an opening is circular (Fig. 3, and Pg. 1, Col. 2, Lns. 19-27). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an opening circular as taught by Swayze et al. with the invention of Bass et al., for the purpose of allowing the key into a slot.

Referring to Claim 24, Bass et al. disclose all the limitations of Claim 22, but do not disclose wherein said antenna is wound about said opening. However, Swayze et al. teach an antenna comprising wherein an antenna is wound about an opening (Fig. 3, and Pg. 1, Col. 2, Lns. 46-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an antenna wound about said opening as taught by Swayze et al. with the invention of Bass et al., for the purpose of receiving clearer reception.

Claims 1-28 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To: DAVID CUPAR
C/O MCDONALD HOPKINS LLC
600 SUPERIOR AVENUE, E. STE. 2100
CLEVELAND, OH 44114

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing (day/month/year)	15 JUL 2011
Applicant's or agent's file reference 16223-00178P 192	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US2011/034564	International filing date (day/month/year) 29 April 2011
Applicant HY-KO PRODUCTS COMPANY	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.
3. ☐ With regard to any protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.
 - ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90bis.1 and 90bis.3).

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until **30 months** from the priority date (in some Offices even later); otherwise, the applicant must, within **20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 Telephone No. PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2010)

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 16223-00178P	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2011/034564	International filing date (day/month/year) 29 April 2011	(Earliest) Priority Date (day/month/year) 14 January 2011
Applicant HYKOPRODUCTS COMPANY		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed.
☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (see Box No. II).

3. ☐ Unity of invention is lacking (see Box No. III).

4. With regard to the title,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

- a. the figure of the drawings to be published with the abstract is Figure No. 1
☒ as suggested by the applicant.
☐ as selected by this Authority, because the applicant failed to suggest a figure.
☐ as selected by this Authority, because this figure better characterizes the invention.
- b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

International application No. PCT/US2011/034564	
A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - B23C 3/35 (2011.01) USPC - 409/81 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) IPC(8) - B23C 1/16, 3/35 (2011.01) USPC - 76/110; 83/413; 269/157; 409/81, 84, 132, 277 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) PatBase, Google Patents	
C. DOCUMENTS CONSIDERED TO BE RELEVANT	
Category*	Citation of document, with indication, where appropriate, of the relevant passages
X	US 2007/0224008 A1 (BASS et al) 27 September 2007 (27.09.2007) entire document
Y	
Y	US 2008/0252551 A1 (KUBO et al) 16 October 2008 (16.10.2008) entire document
Y	US 2,274,012 A (SWAYZE et al) 24 February 1942 (24.02.1942) entire document
A	US 5,676,504 A (MUELLER et al) 14 October 1997 (14.10.1997) entire document
☐ 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 08 July 2011	Date of mailing of the international search report 15 JUL 2011
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: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

From the
INTERNATIONAL SEARCHING AUTHORITY

To: DAVID CUPAR
C/O MCDONALD HOPKINS LLC
600 SUPERIOR AVENUE, E. STE. 2100
CLEVELAND, OH 44114

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year) 15 JUL 2011

Applicant's or agent's file reference
16223-00178P

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US2011/034564

International filing date (day/month/year)

29 April 2011

Priority date (day/month/year)

14 January 2011

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

IPC(8) - B23C 3/35 (2011.01)

USPC - 409/81

Applicant HY-KO PRODUCTS COMPANY

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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

Date of completion of this opinion

08 July 2011

Authorized officer:

Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2009)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application no.
PCT/US2011/034564

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
☒ the international application in the language in which it was filed.
☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a)).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
 - a. (means)
☐ on paper
☐ in electronic form
 - b. (time)
☐ in the international application as filed
☐ together with the international application in electronic form
☐ subsequently to this Authority for the purposes of search
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	7, 9-10, 13, 21, 23-24	YES
	Claims	1-6, 8, 11-12, 14-20, 22, 25-28	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-28	NO
Industrial applicability (IA)	Claims	1-28	YES
	Claims	None	NO
2. Citations and explanations:			
Claims 1-6, 8, 11-12, 14-20, 22, 25-28 lack novelty under PCT Article 33(2) as being anticipated by Bass et al. Referring to Claim 1, Bass et al. disclose a key duplicating machine comprising a key load position to receive a key (Para. [0048]), an antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), configured to communicate with a key located at said key load position (Para. [0061]), and a cutting member (Fig. 8, Left and right cutting wheels 60, 62), configured to cut a key pattern into a key blank at said key load position (Para. [0066]). Referring to Claim 2, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), is configured to transmit data to said key (Paras. [0061], [0065]). Referring to Claim 3, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), is configured to receive data from said key (Para. [0061] - regarding the logic may make direct comparisons between physical dimensions of known key blanks 24 and the features of the master key 22). Referring to Claim 4, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said key is a master key (Fig. 1, master key 22). Referring to Claim 5, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said key is a key blank (Fig. 4b key blank 24). Referring to Claim 6, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said key includes a microchip embedded therein (Para. [0093]). Referring to Claim 8, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose further comprising an outer shell (Fig. 1, outer shell 12), having an opening positioned about said key load position (Fig. 1, and Para. [0046]). Referring to Claim 11, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said key load position comprises a base (Fig. 2, base 16), and a door clamp (Fig. 2, door clamp 14). Referring to Claim 12, Bass et al. disclose a key duplicating machine as in Claim 8, and further disclose wherein said door clamp (Fig. 2, door clamp 14), is movable with respect to said base (Fig. 2, base 16, and Para. [0046]). Referring to Claim 14, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said cutting member (Fig. 8, Left and right cutting wheels 60, 62), is a cutting wheel (Para. [0066]). Referring to Claim 15, Bass et al. disclose a key duplicating machine comprising a key load position to receive a key (Para. [0048]), an antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), configured to communicate with a key located at said key load position (Para. [0061]), and an imaging system (Fig. 6, optical imaging device 50), configured to capture data related to said key at said key load position (Para. [0056]). Referring to Claim 16, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), is configured to transmit data to said key (Paras. [0061], [0065]). Referring to Claim 17, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), is configured to receive data from said key (Para. [0061] - regarding the logic may make direct comparisons between physical dimensions of known key blanks 24 and the features of the master key 22).			

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Referring to Claim 18, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said key is a master key (Fig. 1, master key 22).

Referring to Claim 19, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said key is a key blank (Fig. 4b key blank 24).

Referring to Claim 20, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said key includes a microchip embedded therein (Para. [0093]).

Referring to Claim 22, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose further comprising an outer shell (Fig. 1, outer shell 12), having an opening positioned about said key load position (Fig. 1, and Para. [0046]).

Referring to Claim 25, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said key load position comprises a base (Fig. 2, base 16), and a door clamp (Fig. 2, door clamp 14).

Referring to Claim 26, Bass et al. disclose a key duplicating machine as in Claim 25, and further disclose wherein said door clamp (Fig. 2, door clamp 14), is movable with respect to said base (Fig. 2, base 16, and Para. [0046]).

Referring to Claim 27, Bass et al. disclose a key duplicating machine as in Claim 25, and further disclose further comprising at least one lever (Fig. 2, handle 18), configured to actuate movement of said door clamp (Para. [0046]).

Referring to Claim 28, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said imaging system (Fig. 6, optical imaging device 50), includes a camera (Para. [0056]).

Claims 7, 21 lack an inventive step under PCT Article 33(3) as being obvious over Bass et al. in view of Kubo et al.

Referring to Claim 7, Bass et al. disclose all the limitations of Claim 1, but do not disclose wherein said antenna comprises at least one pair of windings. However, Kubo et al. teach a coil antenna and portable electronic apparatus comprising wherein an antenna (Fig. 2, antenna 100), comprises at least one pair of windings (Fig. 2, windings 2A, 2B). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an antenna comprise at least one pair of windings as taught by Kubo et al. with the invention of Bass et al., for the purpose of customizing the shape of the antenna.

Referring to Claim 21, Bass et al. disclose all the limitations of Claim 15, but do not disclose wherein said antenna comprises at least one pair of windings. However, Kubo et al. teach a coil antenna and portable electronic apparatus comprising wherein an antenna (Fig. 2, antenna 100), comprises at least one pair of windings (Fig. 2, windings 2A, 2B). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an antenna comprise at least one pair of windings as taught by Kubo et al. with the invention of Bass et al., for the purpose of customizing the shape of the antenna.

Claims 9-10, 13, 23-24 lack an inventive step under PCT Article 33(3) as being obvious over Bass et al. in view of Swayze et al.

Referring to Claim 9, Bass et al. disclose all the limitations of Claim 5, but do not disclose wherein said opening is circular. However, Swayze et al. teach an antenna comprising wherein an opening is circular (Fig. 3, and Pg. 1, Col. 2, Lns. 19-27). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an opening circular as taught by Swayze et al. with the invention of Bass et al., for the purpose of allowing the key into a slot.

Referring to Claim 10, Bass et al. disclose all the limitations of Claim 5, but do not disclose wherein said antenna is wound about said opening. However, Swayze et al. teach an antenna comprising wherein an antenna is wound about an opening (Fig. 3, and Pg. 1, Col. 2, Lns. 46-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an antenna wound about said opening as taught by Swayze et al. with the invention of Bass et al., for the purpose of receiving clearer reception.

Referring to Claim 13, Bass et al. in view of Swayze et al. disclose all the limitations of Claim 9, and Bass et al. further disclose further comprising at least one lever (Fig. 2, handle 18), configured to actuate movement of said door clamp (Para. [0046]).

Referring to Claim 23, Bass et al. disclose all the limitations of Claim 22, but do not disclose wherein said opening is circular. However, Swayze et al. teach an antenna comprising wherein an opening is circular (Fig. 3, and Pg. 1, Col. 2, Lns. 19-27). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an opening circular as taught by Swayze et al. with the invention of Bass et al., for the purpose of allowing the key into a slot.

Referring to Claim 24, Bass et al. disclose all the limitations of Claim 22, but do not disclose wherein said antenna is wound about said opening. However, Swayze et al. teach an antenna comprising wherein an antenna is wound about an opening (Fig. 3, and Pg. 1, Col. 2, Lns. 46-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an antenna wound about said opening as taught by Swayze et al. with the invention of Bass et al., for the purpose of receiving clearer reception.

Claims 1-28 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 16223-00153	FOR FURTHER ACTION	See item 4 below
International application No. PCT/US2010/033414	International filing date (<i>day/month/year</i>) 03 May 2010 (03.05.2010)	Priority date (<i>day/month/year</i>) 01 May 2009 (01.05.2009)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant HY-KO PRODUCTS		

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																								
2.	This REPORT consists of a total of 5 sheets, including this cover sheet. In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																								
3.	This report contains indications relating to the following items: <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; text-align: center;">☒</td> <td style="width: 30%;">Box No. I</td> <td style="width: 60%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;">☒</td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	☒	Box No. I	Basis of the report	☐	Box No. II	Priority	☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	☐	Box No. IV	Lack of unity of invention	☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	☐	Box No. VI	Certain documents cited	☐	Box No. VII	Certain defects in the international application	☐	Box No. VIII	Certain observations on the international application
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☐	Box No. VI	Certain documents cited																							
☐	Box No. VII	Certain defects in the international application																							
☐	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Date of issuance of this report 01 November 2011 (01.11.2011)</td> </tr> <tr> <td style="padding: 2px;"> Authorized officer Lingfei Bai </td> </tr> </table> e-mail: pt02.pct@wipo.int	Date of issuance of this report 01 November 2011 (01.11.2011)	Authorized officer Lingfei Bai
Date of issuance of this report 01 November 2011 (01.11.2011)			
Authorized officer Lingfei Bai			

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: DAVID CUPAR
MCDONALD HOPKINS LLC
600 SUPERIOR AVENUE, EAST
SUITE 2100
CLEVELAND, OH 44114

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference 16223-00153		Date of mailing (day/month/year) 18 AUG 2010
International application No. PCT/US2010/033414		FOR FURTHER ACTION See paragraph 2 below
International filing date (day/month/year) 03 May 2010	Priority date (day/month/year) 01 May 2009	
International Patent Classification (IPC) or both national classification and IPC IPC(8) - B23C 1/16 (2010.01) USPC - 409/81		
Applicant HY-KO PRODUCTS		

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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	Date of completion of this opinion 05 August 2010	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2009)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITYInternational application No.
PCT/US2010/033414

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
- ☒ the international application in the language in which it was filed.
- ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
- a. (means)
- ☐ on paper
- ☐ in electronic form
- b. (time)
- ☐ in the international application as filed
- ☐ together with the international application in electronic form
- ☐ subsequently to this Authority for the purposes of search
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2010/033414

Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement																											
1. Statement <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; vertical-align: top;">Novelty (N)</td> <td style="width: 10%; vertical-align: top;">Claims</td> <td style="width: 40%; border-bottom: 1px solid black;">1-23</td> <td style="width: 20%; text-align: right; vertical-align: bottom;">YES</td> </tr> <tr> <td></td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black;">None</td> <td style="text-align: right; vertical-align: bottom;">NO</td> </tr> <tr> <td style="vertical-align: top;">Inventive step (IS)</td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black;">23</td> <td style="text-align: right; vertical-align: bottom;">YES</td> </tr> <tr> <td></td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black;">1-22</td> <td style="text-align: right; vertical-align: bottom;">NO</td> </tr> <tr> <td style="vertical-align: top;">Industrial applicability (IA)</td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black;">1-23</td> <td style="text-align: right; vertical-align: bottom;">YES</td> </tr> <tr> <td></td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black;">None</td> <td style="text-align: right; vertical-align: bottom;">NO</td> </tr> </table>					Novelty (N)	Claims	1-23	YES		Claims	None	NO	Inventive step (IS)	Claims	23	YES		Claims	1-22	NO	Industrial applicability (IA)	Claims	1-23	YES		Claims	None	NO
Novelty (N)	Claims	1-23	YES																									
	Claims	None	NO																									
Inventive step (IS)	Claims	23	YES																									
	Claims	1-22	NO																									
Industrial applicability (IA)	Claims	1-23	YES																									
	Claims	None	NO																									
2. Citations and explanations: Claims 1-22 lack an inventive step under PCT Article 33(3) as being obvious over Bass et al in view of Wills et al. Bass et al discloses in Fig. 1-10, a key identification system (Page 2, Par. (0040)) comprising: [Cim. 1] an imaging system (as stated on Page 5, Par. (0062), wherein the system includes an optical imaging device (digital camera) and a laser scanner) configured to capture an image of the tip (not shown, but stated on Page 5, Par. (0062), lines 7 and 8) of a master key (22), wherein said captured image of said tip includes a contour of a groove in said master key (as stated on Page 5, Par. (0062), lines 9-13); and a logic configured to analyze said captured image to determine characteristics of said groove based on said contour (as stated on Page 5, Par. (0061), lines 1-9) and further to compare said characteristics of said groove with groove characteristics of known key blanks to determine the likelihood of a match between said master key and a known key blank (comparing sequence is stated on Page 3, Par. 0043, lines 6-7 and 20-23); [Cim. 2] wherein said logic includes a database containing data related to characteristics of grooves of known key blanks (as stated on Page 5, Par. (0061), lines 9-14); [Cim. 3] wherein said imaging system includes a camera (50, as stated on Page 4, Par. (0056)); [Cim. 4] wherein said imaging system includes a reflecting device (reflector plate (54)); [Cim. 5] wherein said imaging system includes a light (lighting panel (52)); [Cim. 6] wherein said light is directed toward said reflecting device (as stated on Page 4, Par. (0057), lines 6-8); [Cim. 7] wherein said light includes a shield (blocking plate (56)); [Cim. 8] wherein said captured image is a digital image (as stated on Page 4, Par. (0056)); [Cim. 9] wherein said captured image comprises a silhouette of said tip of said master key (as stated on Page 4, Par. (0055), lines 12-16); [Cim. 11, 12, 13] wherein said logic accounts for rolling, tilting and tipping of said master key with respect to said imaging system to determine characteristics of said groove (wherein variable positioning is taken into account and does not affect imaging as stated on Page 3, Par. (0049), lines 1-12); [Cim. 15] an overhead camera positioned above and approximately perpendicular to said master key (as stated on Page 4, Par. (0055), lines 12-16); [Cim. 16] wherein said groove characteristics are determined based on image data from both said imaging system and said overhead camera (as stated on Page 5, Par. (0062), lines 1-4); [Cim. 17] wherein said logic calculates the geometry of the groove contour ("quantify surface features.. such as the keyway groove" and "identify the width and spacing of a keyway groove" as stated on Page 5, Par. (0062)) as seen from a view of the tip parallel to the blade ("tip view" as stated on Page 5, Par. (0062) line 7 and 8) based on data from both said imaging system and said overhead camera (as stated on Page 5, Par. (0062), line 1, wherein the imaging system is used in addition with imaging device (50, as stated on Page 4, Par. (0056) and Page 5, Par. (0060)); [Cim. 19] a key holder (retention mechanism, (19) as shown in Fig. 2, 3 and 6)) configured to hold said master key (22); [Cim. 20] wherein said key holder includes a lower support (base, (16) as shown in Fig. 1-3); [Cim. 21] wherein said key holder includes an upper door (door clamp (14) as shown in Fig. 1-3); and [Cim. 22] wherein said key holder includes a clamp (also door clamp (14) as shown in Fig. 1-3). However, Bass et al does not disclose: [Cim. 1] wherein the imaging system captures an image at an angle between perpendicular and parallel to the blade of said master key; [Cim. 7] a shield to direct light away from said master key; [Cim. 10] wherein said characteristics of said groove include the geometric shape of said groove; [Cim. 14] a mirror positioned to reflect an image of said master key to be captured by said camera; [Cim. 18] wherein said logic calculates the geometry of the groove contour as though the tip were squarely cut based on data from both said imaging system and said overhead camera. Wills et al discloses in Fig. 1A-9, a key identification system (Col. 5, lines 66 and 67) comprising: [Cim. 1] wherein the imaging system (in this case a laser (39) as shown in Fig. 6-9, which generates a beam of light to analyze the key's surface) captures an image at an angle (8, as shown in Fig. 6-9) between perpendicular and parallel (as shown in Fig. 6-9, and as stated in Col. 12, lines 4-16) to the blade of said master key; [Cim. 10] wherein said characteristics of said groove include the geometric shape of said groove (wherein the groove(s) are considered to be the milling (as stated in Col. 5, lines 55-65), in which the geometric shapes being analyzed are considered to be the "non-planar portions" of the side of the key as stated in Col. 11, lines 51-60); [Cim. 14] a mirror (29, as seen in Fig. 9) positioned to reflect an image of said master key to be captured by said camera (as stated in Col. 7, lines 45-50; [Cim. 18] wherein said logic calculates the geometry of the groove contour as though the tip were squarely cut based on data (wherein the biting analysis (stated in Col. 16, lines 52-60) of the logic determines the groove contour in which the tip back to tip head are measured to determine cut geometry (as stated in Col. 19, lines 42-57) from both said imaging system and said overhead camera (as stated in Col. 19, lines 60-64)). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Bass et al's key identification system with an imaging system: that an image at an angle between the perpendicular and parallel axis of the key blade; wherein the characteristics of the groove include the geometric shape of the groove; a mirror positioned to reflect the image of the master key to be captured by camera; and wherein the logic calculates the groove contour of the key through the tip of the key, all as taught Wills et al for the purpose of providing an exact image of the master key which is to be duplicated onto another key blank. In regards to Claim 7, wherein a shield is used to direct light away from the master key, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art is capable of performing the intended use then it meets the claim. Therefore, the shield of Bass et al is capable of being used to direct light away from the master key.																												

Form PCT/ISA/237 (Box No. V) (July 2009)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2010/033414

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Claim 23 meets the criteria set out in PCT Article 33(2)-(3), because the prior art does not fairly teach or fairly suggest wherein a camera is positioned above the blade of the key and configured to capture an image of a groove in the bottom (opposite surface) of the blade. Wills et al is the closest reference to disclose the claim limitation, however, Wills et al does not disclose wherein the imaging system is positioned at an angle above the key blade, but is angled to capture the bottom groove by the tip is a laser beam, not a camera.

Claims 1-23 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

Form PCT/ISA/237 (Supplemental Box) (July 2009)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 16223-00153	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2010/033414	International filing date (day/month/year) 03 May 2010	(Earliest) Priority Date (day/month/year) 01 May 2009
Applicant HY-KO PRODUCTS		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed.
☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 1
☒ as suggested by the applicant.
☐ as selected by this Authority, because the applicant failed to suggest a figure.
☐ as selected by this Authority, because this figure better characterizes the invention.
- b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2010/033414

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B23C 1/16 (2010.01)

USPC - 409/81

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)

IPC(8) - B23C 1/16, 3/35; B23Q 3/00 (2010.01)

USPC - 76/110; 269/142, 226, 227, 329; 382/100, 181, 218, 219; 409/81, 82, 131, 132

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)

USPTO EAST System (US, USPG-PUB, EPO, DERWENT)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2007/0224008 A1 (BASS et al) 27 September 2007 (27.09.2007) entire document	1-22
Y	US 6,064,747 A (WILLS et al) 16 May 2000 (16.05.2000) entire document	1-22
A	US 6,406,227 B1 (TITUS et al) 18 June 2002 (18.06.2002) entire document	1-22
A	US 2002/0031251 A1 (CAMPBELL et al) 14 March 2002 (14.03.2002) entire document	1-22
A	US 6,449,381 B1 (YANOVSKY et al) 10 September 2002 (10.09.2002) entire document	1-22

☐ 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

05 August 2010

Date of mailing of the international search report

18 AUG 2010

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:

Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300

PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: DAVID CUPAR
MCDONALD HOPKINS LLC
600 SUPERIOR AVENUE, EAST
SUITE 2100
CLEVELAND, OH 44114

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference 16223-00153		Date of mailing (day/month/year) 18 AUG 2010
International application No. PCT/US2010/033414		FOR FURTHER ACTION See paragraph 2 below
International filing date (day/month/year) 03 May 2010	Priority date (day/month/year) 01 May 2009	
International Patent Classification (IPC) or both national classification and IPC IPC(8) - B23C 1/16 (2010.01) USPC - 409/81		
Applicant HY-KO PRODUCTS		

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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	Date of completion of this opinion 05 August 2010	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2009)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2010/033414

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
 - a. (means)
 - ☐ on paper
 - ☐ in electronic form
 - b. (time)
 - ☐ in the international application as filed
 - ☐ together with the international application in electronic form
 - ☐ subsequently to this Authority for the purposes of search
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2010/033414

Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement																											
1. Statement <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; vertical-align: top;">Novelty (N)</td> <td style="width: 10%; vertical-align: top;">Claims</td> <td style="width: 40%; border-bottom: 1px solid black;">1-23</td> <td style="width: 20%; text-align: right; vertical-align: bottom;">YES</td> </tr> <tr> <td></td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black;">None</td> <td style="text-align: right; vertical-align: bottom;">NO</td> </tr> <tr> <td style="vertical-align: top;">Inventive step (IS)</td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black;">23</td> <td style="text-align: right; vertical-align: bottom;">YES</td> </tr> <tr> <td></td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black;">1-22</td> <td style="text-align: right; vertical-align: bottom;">NO</td> </tr> <tr> <td style="vertical-align: top;">Industrial applicability (IA)</td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black;">1-23</td> <td style="text-align: right; vertical-align: bottom;">YES</td> </tr> <tr> <td></td> <td style="vertical-align: top;">Claims</td> <td style="border-bottom: 1px solid black;">None</td> <td style="text-align: right; vertical-align: bottom;">NO</td> </tr> </table>					Novelty (N)	Claims	1-23	YES		Claims	None	NO	Inventive step (IS)	Claims	23	YES		Claims	1-22	NO	Industrial applicability (IA)	Claims	1-23	YES		Claims	None	NO
Novelty (N)	Claims	1-23	YES																									
	Claims	None	NO																									
Inventive step (IS)	Claims	23	YES																									
	Claims	1-22	NO																									
Industrial applicability (IA)	Claims	1-23	YES																									
	Claims	None	NO																									
2. Citations and explanations: Claims 1-22 lack an inventive step under PCT Article 33(3) as being obvious over Bass et al in view of Wills et al. Bass et al discloses in Fig. 1-10, a key identification system (Page 2, Par. (0040)) comprising: [Cim. 1] an imaging system (as stated on Page 5, Par. (0062), wherein the system includes an optical imaging device (digital camera) and a laser scanner) configured to capture an image of the tip (not shown, but stated on Page 5, Par. (0062), lines 7 and 8) of a master key (22), wherein said captured image of said tip includes a contour of a groove in said master key (as stated on Page 5, Par. (0062), lines 9-13); and a logic configured to analyze said captured image to determine characteristics of said groove based on said contour (as stated on Page 5, Par. (0061), lines 1-9) and further to compare said characteristics of said groove with groove characteristics of known key blanks to determine the likelihood of a match between said master key and a known key blank (comparing sequence is stated on Page 3, Par. 0043, lines 6-7 and 20-23); [Cim. 2] wherein said logic includes a database containing data related to characteristics of grooves of known key blanks (as stated on Page 5, Par. (0061), lines 9-14); [Cim. 3] wherein said imaging system includes a camera (50, as stated on Page 4, Par. (0056)); [Cim. 4] wherein said imaging system includes a reflecting device (reflector plate (54)); [Cim. 5] wherein said imaging system includes a light (lighting panel (52)); [Cim. 6] wherein said light is directed toward said reflecting device (as stated on Page 4, Par. (0057), lines 6-8); [Cim. 7] wherein said light includes a shield (blocking plate (56)); [Cim. 8] wherein said captured image is a digital image (as stated on Page 4, Par. (0056)); [Cim. 9] wherein said captured image comprises a silhouette of said tip of said master key (as stated on Page 4, Par. (0055), lines 12-16); [Cim. 11, 12, 13] wherein said logic accounts for rolling, tilting and tipping of said master key with respect to said imaging system to determine characteristics of said groove (wherein variable positioning is taken into account and does not affect imaging as stated on Page 3, Par. (0049), lines 1-12); [Cim. 15] an overhead camera positioned above and approximately perpendicular to said master key (as stated on Page 4, Par. (0055), lines 12-16); [Cim. 16] wherein said groove characteristics are determined based on image data from both said imaging system and said overhead camera (as stated on Page 5, Par. (0062), lines 1-4); [Cim. 17] wherein said logic calculates the geometry of the groove contour ("quantify surface features.. such as the keyway groove" and "identify the width and spacing of a keyway groove" as stated on Page 5, Par. (0062)) as seen from a view of the tip parallel to the blade ("tip view" as stated on Page 5, Par. (0062) line 7 and 8) based on data from both said imaging system and said overhead camera (as stated on Page 5, Par. (0062), line 1, wherein the imaging system is used in addition with imaging device (50, as stated on Page 4, Par. (0056) and Page 5, Par. (0060)); [Cim. 19] a key holder (retention mechanism, (19) as shown in Fig. 2, 3 and 6)) configured to hold said master key (22); [Cim. 20] wherein said key holder includes a lower support (base, (16) as shown in Fig. 1-3); [Cim. 21] wherein said key holder includes an upper door (door clamp (14) as shown in Fig. 1-3); and [Cim. 22] wherein said key holder includes a clamp (also door clamp (14) as shown in Fig. 1-3). However, Bass et al does not disclose: [Cim. 1] wherein the imaging system captures an image at an angle between perpendicular and parallel to the blade of said master key; [Cim. 7] a shield to direct light away from said master key; [Cim. 10] wherein said characteristics of said groove include the geometric shape of said groove; [Cim. 14] a mirror positioned to reflect an image of said master key to be captured by said camera; [Cim. 18] wherein said logic calculates the geometry of the groove contour as though the tip were squarely cut based on data from both said imaging system and said overhead camera. Wills et al discloses in Fig. 1A-9, a key identification system (Col. 5, lines 66 and 67) comprising: [Cim. 1] wherein the imaging system (in this case a laser (39) as shown in Fig. 6-9, which generates a beam of light to analyze the key's surface) captures an image at an angle (8, as shown in Fig. 6-9) between perpendicular and parallel (as shown in Fig. 6-9, and as stated in Col. 12, lines 4-16) to the blade of said master key; [Cim. 10] wherein said characteristics of said groove include the geometric shape of said groove (wherein the groove(s) are considered to be the milling (as stated in Col. 5, lines 55-65), in which the geometric shapes being analyzed are considered to be the "non-planar portions" of the side of the key as stated in Col. 11, lines 51-60); [Cim. 14] a mirror (29, as seen in Fig. 9) positioned to reflect an image of said master key to be captured by said camera (as stated in Col. 7, lines 45-50; [Cim. 18] wherein said logic calculates the geometry of the groove contour as though the tip were squarely cut based on data (wherein the biting analysis (stated in Col. 16, lines 52-60) of the logic determines the groove contour in which the tip back to tip head are measured to determine cut geometry (as stated in Col. 19, lines 42-57) from both said imaging system and said overhead camera (as stated in Col. 19, lines 60-64)). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Bass et al's key identification system with an imaging system: that an image at an angle between the perpendicular and parallel axis of the key blade; wherein the characteristics of the groove include the geometric shape of the groove; a mirror positioned to reflect the image of the master key to be captured by camera; and wherein the logic calculates the groove contour of the key through the tip of the key, all as taught Wills et al for the purpose of providing an exact image of the master key which is to be duplicated onto another key blank. In regards to Claim 7, wherein a shield is used to direct light away from the master key, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art is capable of performing the intended use then it meets the claim. Therefore, the shield of Bass et al is capable of being used to direct light away from the master key.																												

Form PCT/ISA/237 (Box No. V) (July 2009)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2010/033414

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Claim 23 meets the criteria set out in PCT Article 33(2)-(3), because the prior art does not fairly teach or fairly suggest wherein a camera is positioned above the blade of the key and configured to capture an image of a groove in the bottom (opposite surface) of the blade. Wills et al is the closest reference to disclose the claim limitation, however, Wills et al does not disclose wherein the imaging system is positioned at an angle above the key blade, but is angled to capture the bottom groove by the tip is a laser beam, not a camera.

Claims 1-23 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 16223-00058PCT	FOR FURTHER ACTION	See item 4 below
International application No. PCT/US2007/002015	International filing date (<i>day/month/year</i>) 23 January 2007 (23.01.2007)	Priority date (<i>day/month/year</i>) 23 January 2006 (23.01.2006)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant HY-KO PRODUCTS COMPANY		

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																								
2.	This REPORT consists of a total of 6 sheets, including this cover sheet. In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																								
3.	This report contains indications relating to the following items: <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; text-align: center;">☒</td> <td style="width: 30%;">Box No. I</td> <td style="width: 60%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;">☒</td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	☒	Box No. I	Basis of the report	☐	Box No. II	Priority	☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	☐	Box No. IV	Lack of unity of invention	☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	☐	Box No. VI	Certain documents cited	☐	Box No. VII	Certain defects in the international application	☐	Box No. VIII	Certain observations on the international application
☒	Box No. I	Basis of the report																							
☐	Box No. II	Priority																							
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability																							
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☐	Box No. VI	Certain documents cited																							
☐	Box No. VII	Certain defects in the international application																							
☐	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Date of issuance of this report 29 July 2008 (29.07.2008)
Facsimile No. +41 22 338 82 70	Authorized officer Beate Giffo-Schmitt e-mail: pt03.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: Risto Pribisich
Mcdonald Hopkins LLC
600 Superior Avenue, E.
Suite 2100
Cleveland, OH 44114

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year)

28 SEP 2007

Applicant's or agent's file reference
16223-00058PCT

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US 07/02015

International filing date (day/month/year)

23 January 2007 (23.01.2007)

Priority date (day/month/year)

23 January 2006 (23.01.2006)

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

IPC(8) - B23C 1/16 (2007.01)

USPC - 409/81

Applicant Hy-Ko Products Company

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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

Date of completion of this opinion

11 August 2007 (11.08.2007)

Authorized officer:

Lee W. Young

PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (April 2007)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US 07/02015

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of:
 - a. type of material
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing
 - ☐ contained in the international application as filed
 - ☐ filed together with the international application in electronic form
 - ☐ furnished subsequently to this Authority for the purposes of search
4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US 07/02015

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	7, 15 and 20	YES
	Claims	1-6, 8-14, 16-19, 21-26	NO
Inventive step (IS)	Claims	none	YES
	Claims	1-26	NO
Industrial applicability (IA)	Claims	1-26	YES
	Claims	none	NO

2. Citations and explanations:

Claims 1-6, 8-14, 16-19 and 21-23 lack novelty under PCT Article 33(3) as being anticipated by US 5,908,273 A to Titus et al. (herein after Titus).

With respect to claim 1, Titus discloses an assembly (key duplicating apparatus 200, Fig 2-5) for duplicating a master key (original key 202; col 3 In 58-61, Fig 2-5), the assembly comprising: an optical imaging device (video camera 804, video image processor 808, Fig 8; control system 900, Fig 9) for capturing an optical image (image of key; col 8 In 1-27, Fig 8) of at least a portion of the master key, a logic (video image processor 808; col 8 In 1-13) for determining a key pattern (key code 700; col 6 In 21-22, col 7 In 6-20, Fig 7a, 7b) of the master key from the optical image of master key, a clamping assembly (key holder 204; col 3 In 66 to col 4 In 14, Fig 2) for clamping a key blank (blank preform 246; col 3 In 57-65) and a first cutting member (key-code cutter 252; col 4 In 44-50, Fig 4) for cutting a key pattern (key-code; col 4 In 51-56, Fig 4) into the key blank.

With respect to claim 2, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) where the key pattern (key-code; col 4 In 51-56) cut into the key blank (blank preform 246; col 4 In 51-56) is a duplication of the key pattern of master key (original key 202; col 3 In 58-61, Fig 2-5).

With respect to claim 3, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) where the logic (control system 900; col 9 In 1-34, Fig 9) directs the first cutting member (key-code cutter 252 via cutting tool motor 260) during duplication of the key pattern (key-code; col 4 In 51-56) of master key (original key 202; col 3 In 58-61, Fig 2-5).

With respect to claim 4, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) where the optical image (image of key; col 8 In 1-27, Fig 8) is a digital image (via video image processor 808 is controlled by embedded PC central control system 902 via digital I/O interface 930; col 9 In 1-25).

With respect to claim 5, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) where the clamping assembly (key holder 204; col 3 In 66 to col 4 In 14, Fig 2) further comprises, a first clamping member (x-translation stage 214, y-translation stage 218, key holder 204; col 3 In 66 to col 4 In 14, Fig 2) having a first clamping surface (x-translation stage 214) defining a width (x-direction; col 3 In 66 to col 4 In 14) and a second clamping member (y-translation stage 218; col 3 In 66 to col 4 In 14) having a second clamping surface (upper surface of y-translation stage 218) defining a width (y-direction; col 3 In 66 to col 4 In 14).

With respect to claim 6, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) where the key blank (blank preform 245) further comprises a blade (key shaft 102; col 3 In 36-44, Fig 1A) defining a width where the width of the first clamping member (key holder 204; col 3 In 66 to col 4 In 14, Fig 2) and the width of the second clamping member (col 13 In 53-62) are less than the width of the blade of the key blank.

With respect to claim 8, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) where the first cutting member (key code cutter 252, edge cutters 250; col 5 In 1-29) is a cutting wheel (Fig 4, 5).

With respect to claim 9, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) further comprising a retention mechanism (key holder 204, Fig 2) for retaining the master key (original key 202; col 3 In 58-61) or the key blank (blank preform 245).

With respect to claim 10, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) where the retention mechanism further comprises a base (x-translation stage 214, y-translation stage 218, key holder 204; col 3 In 66 to col 4 In 14, Fig 2) a retention plate (tip holder 248; col 12 In 29-39) and a biasing member (key holder solenoid 928; col 9 In 23-25, Fig 9) biasing the retention plate towards the base.

With respect to claim 11, Titus discloses an assembly (key duplication apparatus 200; Fig 2-5) further comprising a first positioning member (x-translation stage 214, key holder 204; col 3 In 66 to col 4 In 14, Fig 2) and a second positioning member (y-translation stage 218), wherein the first and second positioning members engage the master key (original key 202) or the key blank (blank preform 245) to position the master key or the key blank relative to the assembly.

See continuation sheet.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US 07/02015

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V, item 2. Citations and explanations.

With respect to claim 12, Titus discloses an assembly (key duplication apparatus 200; Fig 2-5) further comprising a user interface (display 920; col 9 ln 1-10) for providing output to a user.

With respect to claim 13, Titus discloses an assembly (key duplication apparatus 200; Fig 2-5) where the logic determines the key blank (blank preform 245) from the optical image of the master key (original key 202). (Cutting tool motor 260 is controlled by the central control system 902; col 9 ln 11-25).

With respect to claim 14, Titus discloses an assembly (key duplication apparatus 200; Fig 2-5) where identity of the determined key blank is output to the user by the user interface. (Titus discloses wherein if the measured key is determined to be lost or stolen, a signal may be directed through the communications interface 940; col 12 ln. 10-14.)

With respect to claim 16, Titus discloses an assembly (key duplication apparatus 200; Fig 2-5) where the key blank (blank preform 245) may be clamped in a first orientation or a second orientation. (Titus discloses inserting a double-sided key in either orientation; col 3 ln 45-56.)

With respect to claim 17, Titus discloses an method for duplicating a master key (original key 202) the method comprising capturing an optical image (optical image; col 8 ln 1-13) of at least a portion of the master key, providing a logic (via central control system 902) to determine a key pattern (key code) of the master key from the optical image of the master key, securing a key blank (blank preform 245) and cutting a key pattern into the key blank. (See col 9 ln 1-25, col 10 ln 6-22.)

With respect to claim 18, Titus discloses a method where the key pattern (key code) cut into the key blank (blank preform 245) is a duplication of the key pattern of the master key (original key 202). (See col 3 ln 57-65.)

With respect to claim 19, Titus discloses a method further comprising using logic to determine the key blank (blank preform 245). (See col 12 ln 20-39.)

With respect to claim 21, Titus discloses a method further comprising, capturing an optical image (optical image; col 8 ln 1-13) of at least a portion of the key blank (blank preform 245) and using the logic to validate the key blank matches the master key (original key 202). (Titus discloses using edge cutters 250 stroke or pass pattern computed that approximates the keyway profile shape is within acceptable tolerances; col 13 ln. 3-12.)

With respect to claim 22, Titus discloses a method further comprising capturing an optical image of at least a portion of the key pattern cut into key blank (blank preform 245), using the logic to determine the key pattern cut into key blank, and using the logic to compare the key pattern cut into the key blank with the key pattern of the master key. (See col 11 ln 36-47).

With respect to claim 23, Titus discloses a method comprising using the logic to validate that the key pattern cut into the key plank (blank preform 245) is within a predefined tolerance of the key pattern of the master key (original key 202). (See col 11 ln 36-47).

Claims 24-26 lack novelty under PCT Article 33(2) as being anticipated by 2004/0095380 A1 to Bass et al. (herein after Bass).

With respect to claim 24, Bass discloses an assembly for identifying a key blank (identification system 10, Key Identification System KIDS) for the duplication of a master key (master key; Bass para [0048], the assembly comprising, an optical imaging device (machine-recognizable object verification system, bar code scanner; Bass para [0058]) for capturing an optical image of at least a portion of the master key, a logic for determining at least one feature (manufacturer; Bass para [0031]) of the master key from the optical image of aster key for comparison with at least one feature of a plurality of key blanks, and identifying which of the plurality of key blanks is the proper key blank (via indicative display rack; Bass para [0035], [0041]) and identifying which of the plurality of key blanks is the proper key blank for duplication of the master key.

With respect to claim 25, Bass discloses an assembly where identity of the proper key blank is output to a user by a user interface (display rack; Bass para [0035], [0041]).

With respect to claim 26, Bass discloses an assembly wherein the user interface is a display rack (display rack; Bass para [0035], [0041]) for the display of the plurality of key blanks.

See continuation sheet.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 07/02015

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V, item 2. Citations and explanations.

Claims 7 and 20 lack an inventive step under PCT Article 33(3) as being obvious over Titus.

With respect to claim 7, Titus discloses an assembly (key duplication apparatus 200; Fig 2-5) further comprising a second cutting member (edge cutters 250; col 5 ln 4-29, Fig 18) for cutting the key pattern into key blank (blank preform 245), yet fails to disclose where the first and second cutting members are capable of simultaneously cutting the key pattern into the key blank. However, Titus discloses forming a keyway on a first side of a blank and subsequently forming a keyway on a second side of a blank for permitting maximum material removal per pass. (col 13 ln 3-23, Claim 37). Hence, it would have been obvious to one of skill in the art to duplicate the first cutting member of Titus to construct an assembly comprising a second cutting member for cutting the key pattern into a key blank, where the first and second cutting members are capable of simultaneously cutting the key pattern into a key blank for maximizing material removal per pass as taught by Titus.

With respect to claim 20, Titus discloses a method of duplicating a master key (original key 202) with a key blank (blank preform 245) wherein the user is signaled through the communication interface (940) concerning the measured key, yet fails to disclose a method further comprising outputting the determined key blank to a user. Hence, it would have been obvious to one of skill in the art to combine the signaling through the communication interface with the identification of the key blank of Titus, to formulate a method further comprising outputting the determined key blank to a user as taught by Titus. (col 12 ln 10-14.)

Claim 15 lacks an inventive step under PCT Article 33(3) as being obvious over Titus in view of Bass.

With respect to claim 15, Titus discloses an assembly (key duplication apparatus 200) comprising a user interface (display 920; Titus col 9 ln 1-10), yet fails to disclose an interface further comprising a display rack. However, Bass discloses a object identification system for identification of key blanks comprising a display rack (display rack 100; Bass para [0070]) for indicating the appropriate key blank. Hence, it would have been obvious to one of skill in the art to combine the assembly (key duplication apparatus 200) comprising a user interface (display 920) of Titus with the display rack (display rack 100) of Bass to construct an assembly where the user interface is a display rack for the display of a plurality of key blanks as taught by Bass.

Claims 1-26 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used by industry.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To: Risto Pribisich
Mcdonald Hopkins LLC
600 Superior Avenue, E.
Suite 2100
Cleveland, OH 44114

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing (day/month/year) **28 SEP 2007**

Applicant's or agent's file reference
16223-00058PCT

FOR FURTHER ACTION See paragraphs 1 and 4 below

International application No.
PCT/US 07/02015

International filing date
(day/month/year) **23 January 2007 (23.01.2007)**

Applicant **Hy-Ko Products Company**

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: +41 22 740 14 35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
- ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

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

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 16223-00058PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 07/02015	International filing date (<i>day/month/year</i>) 23 January 2007 (23.01.2007)	(Earliest) Priority Date (<i>day/month/year</i>) 23 January 2006 (23.01.2006)
Applicant Hy-Ko Products Company		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed.
☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

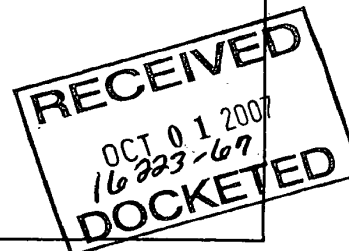
- ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 1
☒ as suggested by the applicant.
☐ as selected by this Authority, because the applicant failed to suggest a figure.
☐ as selected by this Authority, because this figure better characterizes the invention.
- b. ☐ none of the figures is to be published with the abstract.



Form PCT/ISA/210 (first sheet) (April 2007)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 07/02015

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B23C 1/16 (2007.01)

USPC - 409/81

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)

IPC (8): B23C 1/16 (2007.01)

USPC: 409/81

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

IPC (8): B23C 1/16 (2007.01)

USPC: 409/81, 93, 96

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

PubWEST(USPT,PGPB,EPAB,JPAB); Internet search via Google Web and Google Patent search engines.

Search Terms Used: key, duplicator, duplication, duplicate, optical, image, digital

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 5,908,273 A (TITUS et al.) 01 June 1999 (01.06.1999), col 3 ln 45 to col 4 ln 14, col 4 ln 51-56, col 5 ln 1-29, col 6 ln 21-22, col 7 ln 6-20, col 8 ln 1-27, col 9 ln 1-34, col 10 ln 6-22, col 11 ln 36-47, col 12 ln 10-39, col 13 ln 3-23, 53-62, Fig 2-5, 7a, 7b, 8, 9, 18, claim 37	1-14 and 16-23 ----- 15
X --- Y	US 2004/0095380 A1 (BASS et al.) 20 May 2004 (20.05.2004), para [0031], [0035], [0041], [0048], [0058], [0070]	24-26 ----- 15
A	US 6,406,227 B1 (TITUS et al.) 18 June 2002 (18.06.2002), Fig 6, 9	1-26
A	US 6,588,995 B2 (WILLS et al.) 08 July 2003 (08.07.2003), Fig 8, 9	1-26

☐ 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

11 August 2007 (11.08.2007)

Date of mailing of the international search report

28 SEP 2007

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

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: Risto Pribisich
Mcdonald Hopkins LLC
600 Superior Avenue, E.
Suite 2100
Cleveland, OH 44114

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year)

28 SEP 2007

Applicant's or agent's file reference
16223-00058PCT

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US 07/02015

International filing date (day/month/year)

23 January 2007 (23.01.2007)

Priority date (day/month/year)

23 January 2006 (23.01.2006)

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

IPC(8) - B23C 1/16 (2007.01)

USPC - 409/81

Applicant Hy-Ko Products Company

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

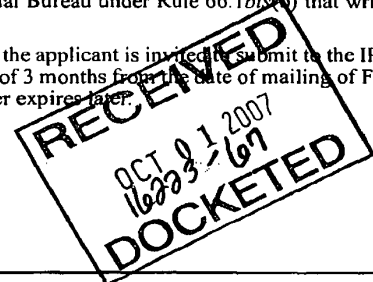
2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.



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

Date of completion of this opinion

11 August 2007 (11.08.2007)

Authorized officer:

Lee W. Young

PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (April 2007)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US 07/02015

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of:
 - a. type of material
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing
 - ☐ contained in the international application as filed
 - ☐ filed together with the international application in electronic form
 - ☐ furnished subsequently to this Authority for the purposes of search
4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US 07/02015

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	7, 15 and 20	YES
	Claims	1-6, 8-14, 16-19, 21-26	NO
Inventive step (IS)	Claims	none	YES
	Claims	1-26	NO
Industrial applicability (IA)	Claims	1-26	YES
	Claims	none	NO

2. Citations and explanations:

Claims 1-6, 8-14, 16-19 and 21-23 lack novelty under PCT Article 33(3) as being anticipated by US 5,908,273 A to Titus et al. (herein after Titus).

With respect to claim 1, Titus discloses an assembly (key duplicating apparatus 200, Fig 2-5) for duplicating a master key (original key 202; col 3 In 58-61, Fig 2-5), the assembly comprising: an optical imaging device (video camera 804, video image processor 808, Fig 8; control system 900, Fig 9) for capturing an optical image (image of key; col 8 In 1-27, Fig 8) of at least a portion of the master key, a logic (video image processor 808; col 8 In 1-13) for determining a key pattern (key code 700; col 6 In 21-22, col 7 In 6-20, Fig 7a, 7b) of the master key from the optical image of master key, a clamping assembly (key holder 204; col 3 In 66 to col 4 In 4, Fig 2) for clamping a key blank (blank preform 246; col 3 In 57-65) and a first cutting member (key-code cutter 252; col 4 In 44-50, Fig 4) for cutting a key pattern (key-code; col 4 In 51-56, Fig 4) into the key blank.

With respect to claim 2, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) where the key pattern (key-code; col 4 In 51-56) cut into the key blank (blank preform 246; col 4 In 51-56) is a duplication of the key pattern of master key (original key 202; col 3 In 58-61, Fig 2-5).

With respect to claim 3, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) where the logic (control system 900; col 9 In 1-34, Fig 9) directs the first cutting member (key-code cutter 252 via cutting tool motor 260) during duplication of the key pattern (key-code; col 4 In 51-56) of master key (original key 202; col 3 In 58-61, Fig 2-5).

With respect to claim 4, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) where the optical image (image of key; col 8 In 1-27, Fig 8) is a digital image (via video image processor 808 is controlled by embedded PC central control system 902 via digital I/O interface 930; col 9 In 1-25).

With respect to claim 5, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) where the clamping assembly (key holder 204; col 3 In 66 to col 4 In 4, Fig 2) further comprises, a first clamping member (x-translation stage 214, y-translation stage 218, key holder 204; col 3 In 66 to col 4 In 14, Fig 2) having a first clamping surface (x-translation stage 214) defining a width (x-direction; col 3 In 66 to col 4 In 14) and a second clamping member (y-translation stage 218; col 3 In 66 to col 4 In 14) having a second clamping surface (upper surface of y-translation stage 218) defining a width (y-direction; col 3 In 66 to col 4 In 14).

With respect to claim 6, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) where the key blank (blank preform 245) further comprises a blade (key shaft 102; col 3 In 36-44, Fig 1A) defining a width where the width of the first clamping member (key holder 204; col 3 In 66 to col 4 In 4, Fig 2) and the width of the second clamping member (col 13 In 53-62) are less than the width of the blade of the key blank.

With respect to claim 8, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) where the first cutting member (key code cutter 252, edge cutters 250; col 5 In 1-29) is a cutting wheel (Fig 4, 5).

With respect to claim 9, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) further comprising a retention mechanism (key holder 204, Fig 2) for retaining the master key (original key 202; col 3 In 58-61) or the key blank (blank preform 245).

With respect to claim 10, Titus discloses an assembly (key duplicating apparatus 200; Fig 2-5) where the retention mechanism further comprises a base (x-translation stage 214, y-translation stage 218, key holder 204; col 3 In 66 to col 4 In 14, Fig 2) a retention plate (tip holder 248; col 12 In 29-39) and a biasing member (key holder solenoid 928; col 9 In 23-25, Fig 9) biasing the retention plate towards the base.

With respect to claim 11, Titus discloses an assembly (key duplication apparatus 200; Fig 2-5) further comprising a first positioning member (x-translation stage 214, key holder 204; col 3 In 66 to col 4 In 14, Fig 2) and a second positioning member (y-translation stage 218), wherein the first and second positioning members engage the master key (original key 202) or the key blank (blank preform 245) to position the master key or the key blank relative to the assembly.

See continuation sheet.

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US 07/02015

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V, item 2. Citations and explanations.

With respect to claim 12, Titus discloses an assembly (key duplication apparatus 200; Fig 2-5) further comprising a user interface (display 920; col 9 ln 1-10) for providing output to a user.

With respect to claim 13, Titus discloses an assembly (key duplication apparatus 200; Fig 2-5) where the logic determines the key blank (blank preform 245) from the optical image of the master key (original key 202). (Cutting tool motor 260 is controlled by the central control system 902; col 9 ln 11-25).

With respect to claim 14, Titus discloses an assembly (key duplication apparatus 200; Fig 2-5) where identity of the determined key blank is output to the user by the user interface. (Titus discloses wherein if the measured key is determined to be lost or stolen, a signal may be directed through the communications interface 940; col 12 ln. 10-14.)

With respect to claim 16, Titus discloses an assembly (key duplication apparatus 200; Fig 2-5) where the key blank (blank preform 245) may be clamped in a first orientation or a second orientation. (Titus discloses inserting a double-sided key in either orientation; col 3 ln 45-56.)

With respect to claim 17, Titus discloses an method for duplicating a master key (original key 202) the method comprising capturing an optical image (optical image; col 8 ln 1-13) of at least a portion of the master key, providing a logic (via central control system 902) to determine a key pattern (key code) of the master key from the optical image of the master key, securing a key blank (blank preform 245) and cutting a key pattern into the key blank. (See col 9 ln 1-25, col 10 ln 6-22.)

With respect to claim 18, Titus discloses a method where the key pattern (key code) cut into the key blank (blank preform 245) is a duplication of the key pattern of the master key (original key 202). (See col 3 ln 57-65.)

With respect to claim 19, Titus discloses a method further comprising using logic to determine the key blank (blank preform 245). (See col 12 ln 20-39.)

With respect to claim 21, Titus discloses a method further comprising, capturing an optical image (optical image; col 8 ln 1-13) of at least a portion of the key blank (blank preform 245) and using the logic to validate the key blank matches the master key (original key 202). (Titus discloses using edge cutters 250 stroke or pass pattern computed that approximates the keyway profile shape is within acceptable tolerances; col 13 ln. 3-12.)

With respect to claim 22, Titus discloses a method further comprising capturing an optical image of at least a portion of the key pattern cut into key blank (blank preform 245), using the logic to determine the key pattern cut into key blank, and using the logic to compare the key pattern cut into the key blank with the key pattern of the master key. (See col 11 ln 36-47).

With respect to claim 23, Titus discloses a method comprising using the logic to validate that the key pattern cut into the key plank (blank preform 245) is within a predefined tolerance of the key pattern of the master key (original key 202). (See col 11 ln 36-47).

Claims 24-26 lack novelty under PCT Article 33(2) as being anticipated by 2004/0095380 A1 to Bass et al. (herein after Bass).

With respect to claim 24, Bass discloses an assembly for identifying a key blank (identification system 10, Key Identification System KIDS) for the duplication of a master key (master key; Bass para [0048], the assembly comprising, an optical imaging device (machine-recognizable object verification system, bar code scanner; Bass para [0058]) for capturing an optical image of at least a portion of the master key, a logic for determining at least one feature (manufacturer; Bass para [0031]) of the master key from the optical image of aster key for comparison with at least one feature of a plurality of key blanks, and identifying which of the plurality of key blanks is the proper key blank (via indicative display rack; Bass para [0035], [0041]) and identifying which of the plurality of key blanks is the proper key blank for duplication of the master key.

With respect to claim 25, Bass discloses an assembly where identity of the proper key blank is output to a user by a user interface (display rack; Bass para [0035], [0041]).

With respect to claim 26, Bass discloses an assembly wherein the user interface is a display rack (display rack; Bass para [0035], [0041]) for the display of the plurality of key blanks.

See continuation sheet.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 07/02015

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box V, item 2. Citations and explanations.

Claims 7 and 20 lack an inventive step under PCT Article 33(3) as being obvious over Titus.

With respect to claim 7, Titus discloses an assembly (key duplication apparatus 200; Fig 2-5) further comprising a second cutting member (edge cutters 250; col 5 ln 4-29, Fig 18) for cutting the key pattern into key blank (blank preform 245), yet fails to disclose where the first and second cutting members are capable of simultaneously cutting the key pattern into the key blank. However, Titus discloses forming a keyway on a first side of a blank and subsequently forming a keyway on a second side of a blank for permitting maximum material removal per pass. (col 13 ln 3-23, Claim 37). Hence, it would have been obvious to one of skill in the art to duplicate the first cutting member of Titus to construct an assembly comprising a second cutting member for cutting the key pattern into a key blank, where the first and second cutting members are capable of simultaneously cutting the key pattern into a key blank for maximizing material removal per pass as taught by Titus.

With respect to claim 20, Titus discloses a method of duplicating a master key (original key 202) with a key blank (blank preform 245) wherein the user is signaled through the communication interface (940) concerning the measured key, yet fails to disclose a method further comprising outputting the determined key blank to a user. Hence, it would have been obvious to one of skill in the art to combine the signaling through the communication interface with the identification of the key blank of Titus, to formulate a method further comprising outputting the determined key blank to a user as taught by Titus. (col 12 ln 10-14.)

Claim 15 lacks an inventive step under PCT Article 33(3) as being obvious over Titus in view of Bass.

With respect to claim 15, Titus discloses an assembly (key duplication apparatus 200) comprising a user interface (display 920; Titus col 9 ln 1-10), yet fails to disclose an interface further comprising a display rack. However, Bass discloses a object identification system for identification of key blanks comprising a display rack (display rack 100; Bass para [0070]) for indicating the appropriate key blank. Hence, it would have been obvious to one of skill in the art to combine the assembly (key duplication apparatus 200) comprising a user interface (display 920) of Titus with the display rack (display rack 100) of Bass to construct an assembly where the user interface is a display rack for the display of a plurality of key blanks as taught by Bass.

Claims 1-26 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used by industry.

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under Article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article," "Rule" and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Volume I/A, Annexes B1 and B2).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no international search report would be established (see *PCT Applicant's Guide*, Volume I/A, paragraph 296).

What parts of the international application may be amended ?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Preliminary Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When ? Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments ?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How ? Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments ?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers, claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under Article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

If a demand for international preliminary examination is made, the written opinion of the International Searching Authority will, except in certain cases where the International Preliminary Examining Authority did not act as International Searching Authority and where it has notified the International Bureau under Rule 66.1bis(b), be considered to be a written opinion of the International Preliminary Examining Authority. If a demand is made, the applicant may submit to the International Preliminary Examining Authority a reply to the written opinion together, where appropriate, with amendments before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later (Rule 43bis.1(c)).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see the *PCT Applicant's Guide*, Volume II.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 16223-00154	FOR FURTHER ACTION	See item 4 below
International application No. PCT/US2010/033421	International filing date (<i>day/month/year</i>) 03 May 2010 (03.05.2010)	Priority date (<i>day/month/year</i>) 01 May 2009 (01.05.2009)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant HY-KO PRODUCTS		

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																								
2.	This REPORT consists of a total of 5 sheets, including this cover sheet. In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																								
3.	This report contains indications relating to the following items: <table style="width: 100%; border: none;"> <tr> <td style="width: 5%; text-align: center;">☒</td> <td style="width: 30%;">Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;">☒</td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;">☐</td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	☒	Box No. I	Basis of the report	☐	Box No. II	Priority	☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	☐	Box No. IV	Lack of unity of invention	☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	☐	Box No. VI	Certain documents cited	☐	Box No. VII	Certain defects in the international application	☐	Box No. VIII	Certain observations on the international application
☒	Box No. I	Basis of the report																							
☐	Box No. II	Priority																							
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☐	Box No. VI	Certain documents cited																							
☐	Box No. VII	Certain defects in the international application																							
☐	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Date of issuance of this report 01 November 2011 (01.11.2011)</td> <td style="width: 50%;">Authorized officer Nora Lindner</td> </tr> <tr> <td colspan="2">e-mail: pt03.pct@wipo.int</td> </tr> </table>	Date of issuance of this report 01 November 2011 (01.11.2011)	Authorized officer Nora Lindner	e-mail: pt03.pct@wipo.int	
Date of issuance of this report 01 November 2011 (01.11.2011)	Authorized officer Nora Lindner				
e-mail: pt03.pct@wipo.int					

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: DAVID B. CUPAR
MCDONALD HOPKINS LLC
600 SUPERIOR AVENUE, EAST
CLEVELAND, OH 44114

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year)

17 SEP 2010

Applicant's or agent's file reference
16223-00154

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US 10/33421

International filing date (day/month/year)

03 May 2010 (03.05.2010)

Priority date (day/month/year)

01 May 2009 (01.05.2009)

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

IPC(8) - B21K 13/00, B23C 1/16 (2010.01)

USPC - 76/110, 409/81

Applicant HY-KO PRODUCTS

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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

Date of completion of this opinion

22 July 2010 (22.07.2010)

Authorized officer:

Lee W. Young

PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2009)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITYInternational application No.
PCT/US 10/33421

Box No. 1 Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
- ☒ the international application in the language in which it was filed.
- ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
- a. (means)
- ☐ on paper
- ☐ in electronic form
- b. (time)
- ☐ in the international application as filed
- ☐ together with the international application in electronic form
- ☐ subsequently to this Authority for the purposes of search
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US 10/33421

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	None	YES
	Claims	1-20	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-20 lack novelty under PCT Article 33(2) as being anticipated by US 2007/0224008 A1 to Bass, et al. (hereinafter Bass.).

Regarding claim 1, Bass teaches a key identification system comprising: a sensing system configured to extract biting information from a master key (para [0043]); and a logic configured to analyze said biting information to determine characteristics of said bittings of said master key and further to compare said characteristics of said bittings with biting characteristics of known key blanks to determine the likelihood of a match between said master key and a known key blank (para [0061]).

Regarding claim 2, Bass teaches that said logic includes a database containing data related to biting characteristics of known key blanks (para [0061]).

Regarding claim 3, Bass teaches that said sensing system comprises an imaging system (para [0060]).

Regarding claim 4, Bass teaches that said imaging system is configured to capture an image of the bittings of said master key (para [0060]).

Regarding claim 5, Bass teaches that said imaging system includes a camera (para [0056]).

Regarding claim 6, Bass teaches that said camera is positioned perpendicular to the blade of said master key (para [0055]).

Regarding claim 7, Bass teaches that said imaging system includes a light (para [0058]).

Regarding claim 8, Bass teaches that said captured image is a digital image (para [0056]).

Regarding claim 9, Bass teaches a key holder to hold said master key (para [0047]).

Regarding claim 10, Bass teaches that said key holder comprises a support and an upper door (base 16 and door clamp 14; para [0047]).

Regarding claim 11, Bass teaches that said data related to biting characteristics of known key blanks includes a set of depths at given blade spacing points associated with a given key blank (para [0060]).

Regarding claim 12, Bass teaches that said data related to biting characteristics of known key blanks includes a set of biting flat widths at given blade spacing points associated with a given key blank (para [0060]).

Regarding claim 13, Bass teaches that said data related to biting characteristics of known key blanks includes a set of biting centers associated with a given key blank (para [0061]).

Regarding claim 14, Bass teaches that said logic compares the depth of the master key biting at each spacing point to said set of depths for said given key blank (para [0060]).

Regarding claim 15, Bass teaches that said logic computes a score for said given key blank based on the comparison between the depths of said master key at each spacing point and said set of depths for said given key blank (inherent to a comparison logic; para [0060]).

(see continuation in supplemental box)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US 10/33421

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:
Box No. V(2) -- Citations and Explanations

Regarding claim 16, Bass teaches that said logic compares the biting flat widths of the master key biting at each spacing point to said set of biting flat widths for said given key blank (inherent to a comparison logic; para [0060]).

Regarding claim 17, Bass teaches that said logic computes a score for said given key blank based on the comparison between the biting flat widths of said master key at each spacing point and said set of biting flat widths for said given key blank (inherent to a comparison logic; para [0060]).

Regarding claim 18, Bass teaches that said logic compares the biting centers of the master key biting to said set of biting centers for said given key blank (inherent to a comparison logic; para [0060]).

Regarding claim 19, Bass teaches that said logic computes a score for said given key blank based on the comparison between the biting centers of said master key and said set of biting centers for said given key blank (inherent to a comparison logic; para [0060]).

Regarding claim 20, Bass teaches that said logic analyzes one of a biting depth, a biting flat width, and a biting center of said master key at a blade spacing point shifted from said blade spacing point associated with a given key blank (determining where along the blade the key pattern begins; para [0060]).

Claims 1-20 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 16223-00154	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US 10/33421	International filing date (<i>day/month/year</i>) 03 May 2010 (03.05.2010)	(Earliest) Priority Date (<i>day/month/year</i>) 01 May 2009 (01.05.2009)
Applicant HY-KO PRODUCTS		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed.
☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (see Box No. II).

3. ☐ Unity of invention is lacking (see Box No. III).

4. With regard to the title,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

- a. the figure of the drawings to be published with the abstract is Figure No. 1
☒ as suggested by the applicant.
☐ as selected by this Authority, because the applicant failed to suggest a figure.
☐ as selected by this Authority, because this figure better characterizes the invention.
- b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 10/33421

A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - B21K 13/00, B23C 1/16 (2010.01) USPC - 76/110, 409/81 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) IPC (8) - B21K 13/00, B23C 1/16 (2010.01) USPC - 76/110, 409/81 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched USPC - 76/1, 101.1; 409/79, 84, 93; 70/266, 336, 393, 406 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PUBWEST (PGPB,USPT,USOC,EPAB,JPAB) Terms - image imaging camera blank select choose determine identify light door master key biting Google - key blank identification digital camera master; key blank identification digital camera logic holder door		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/0224008 A1 (BASS, ET AL.) 27 September 2007 (27.09.2007), para [0043], [0047], [0055]-[0061]	1-20
A	US 5,127,532 A (CIMINO, ET AL.) 07 July 1992 (07.07.1992), entire document	1-20
A	US 6,065,911 A (ALMBLAD, ET AL.) 23 May 2000 (23.05.2000), entire document	1-20
☐ 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 21 July 2010 (21.07.2010)		Date of mailing of the international search report 17-SEP-2010
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) (July 2009)

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING		
First Named Inventor/Applicant Name:		Chester O.D. Thompson		
Filer:		Mark Jason Masterson/danielle mueller		
Attorney Docket Number:		16223-00341		
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	75	75
UTILITY SEARCH FEE	2111	1	330	330
UTILITY EXAMINATION FEE	2311	1	380	380
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				785

Electronic Acknowledgement Receipt	
EFS ID:	32051151
Application Number:	15920955
International Application Number:	
Confirmation Number:	2833
Title of Invention:	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING
First Named Inventor/Applicant Name:	Chester O.D. Thompson
Customer Number:	33772
Filer:	Mark Jason Masterson/danielle mueller
Filer Authorized By:	Mark Jason Masterson
Attorney Docket Number:	16223-00341
Receipt Date:	14-MAR-2018
Filing Date:	
Time Stamp:	14:52:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$785
RAM confirmation Number	031518INTEFSW00001146130265
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Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

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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.

Electronic Acknowledgement Receipt	
EFS ID:	32051151
Application Number:	15920955
International Application Number:	
Confirmation Number:	2833
Title of Invention:	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING
First Named Inventor/Applicant Name:	Chester O.D. Thompson
Customer Number:	33772
Filer:	Mark Jason Masterson/danielle mueller
Filer Authorized By:	Mark Jason Masterson
Attorney Docket Number:	16223-00341
Receipt Date:	14-MAR-2018
Filing Date:	
Time Stamp:	14:52:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$785
RAM confirmation Number	031518INTEFSW00001146130265
Deposit Account	
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The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

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PATENT APPLICATION

Inventor: Chester O.D. Thompson
William R. Mutch

Docket No.: 16223-00341

KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Application No. 15/351,634 filed on November 15, 2016 entitled “KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING,” which is a continuation of U.S. Application No. 14/162,157 filed on January 23, 2014 entitled “KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING,” which is a continuation of U.S. Application No. 12/772,709 filed on May 3, 2010 entitled “KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING,” which claims the benefit of priority of U.S. Provisional Patent Application Ser. No. 61/215,152 filed on May 1, 2009, and U.S. Provisional Patent Application Ser. No. 61/275,654 filed on September 1, 2009, each of which are hereby incorporated by reference in their entirety.

FIELD OF ART

[0002] This invention relates generally to the field of systems for identifying objects and, more particularly to systems for utilizing electronic means for identifying key blanks that are compatible with an unknown key.

BACKGROUND OF THE INVENTION

[0003] The art of key replication is well known. Commonly, a key intended for duplication (the master key) is copied on to an appropriately identified key blank utilizing any number of different systems known in the art. The process of identifying an appropriate key blank to use

when making copies of a key can be a difficult, tedious and time consuming affair. It is important that each master key be copied onto the proper key blank so as to prevent numerous adverse consequences caused by reproducing a master key onto an inappropriate key blank. However, choosing the correct key blank can be difficult even for experts in the field.

[0004] There are hundreds, if not thousands, of key blanks, and many blanks are not readily distinguished from others. Identifying the correct key blank for use in duplication involves selecting a blank from hundreds or even thousands of possibilities, where differences between key blanks may be very subtle. These hard-to-notice subtleties significantly increase the level of difficulty for all operators of such key replication systems, both inexperienced trainees and experts alike.

[0005] Once a key blank is chosen, it goes through a cutting process. The typical cutting process simply traces the profile of the master key onto the key blank, such that the key blank will exactly match (within the error limits and accuracy of the tracing machine) the original master key. Normally, a mechanically linked cutting wheel actually cuts into the key blank while it mimics the movement of the tracer as the tracer moves longitudinally along the profile of the master key. If the incorrect key blank is provided during this process, the key blank being formed into the duplicate key may not possess the correct longitudinal length, thereby causing a failure. When this type of failure occurs, the entire process of selecting a key blank for replication and then mechanically cutting the key must begin again. Worse still, if the blank has the proper length but does not possess the appropriate thickness, contour, groove or other traits, the failure may not be discovered until the key is actually inserted into the lock.

[0006] Businesses that offer key cutting services are often times not staffed by experienced locksmiths. Instead, employees are usually trained to “eyeball” what is thought to be the

correct blank and then cut a duplicate key. Such informal and imprecise key blank identification invariably increases the rate of failures for the duplication process. These failures often occur at the expense of the industry and to the extreme dismay of the key holder. Therefore, the industry would welcome an easy-to-use key blank identification system that increases the accuracy and efficiency of key replication.

[0007] Not surprisingly, numerous attempts have been made to improve identification systems and/or key replication systems. Many of these improvements include imaging systems designed to determine the proper key blank based on physical parameters of the key to be copied, such as length, shape, and groove characteristics.

[0008] While many of these systems provide useful improvements for determining a proper key blank, they still suffer from various deficiencies. Specifically, many of these systems compare scanned data from a master key to be copied with data from known key blanks in order to determine if the master key matches the key blank. However, in some instances the scanned key parameters and the key blank data are insufficient to determine a matching key blank. In such cases, additional information about the master key and the key blank would be useful in narrowing the field of prospective key blanks. Accordingly, an improved system and method for determining a key blank is needed.

SUMMARY

[0009] A key identification system is provided. The key identification system comprises an imaging system to capture an image of a master key, and a logic to analyze the image. The imaging system may be configured to capture an image of a groove in the key from an angle between perpendicular and parallel to the blade of said master key. The logic analyzes the captured image to compare characteristics of the groove with groove characteristics of known key blanks.

[0010] The key identification system may account for the orientation or positioning of the master key with respect to the imaging system or key holder to determine groove characteristics of the master key. For example, the logic may analyze a contour of the groove and determine groove characteristics of the master key based on the contour and the orientation and positioning of the master key.

DESCRIPTION OF THE DRAWINGS

[0011] Objects and advantages together with the operation of the invention may be better understood by reference to the following detailed description taken in connection with the following illustrations, wherein:

[0012] FIG. 1 illustrates a master key;

[0013] FIG. 2a illustrates a first example configuration of a key ID system;

[0014] FIG. 2b illustrates a second example configuration of a key ID system;

[0015] FIG. 3 illustrates an example silhouette of a key tip;

[0016] FIG. 4 illustrates an example configuration of a key ID system with reflectors;

[0017] FIG. 5 illustrates an example scanned image of a master key blade silhouette;

[0018] FIG. 6 illustrates an example projection of a tip outline onto the image of a tip;

[0019] FIG. 7 illustrates an example calculated data set of tip groove contours;

[0020] FIG. 8 illustrates an example matching comparison between master key tip contour data and stored key blank data; and

[0021] FIG. 9 illustrates an example unmatched comparison between master key tip contour data and stored key blank data.

[0022] FIG. 10 illustrates the coordinate references for the outline camera image.

[0023] FIG. 11 illustrates the coordinate references for the outline camera image including the outline vanishing point.

[0024] FIG. 12 illustrates the coordinate references for the groove camera image including the groove vanishing point relating to the y-axis projection.

[0025] FIG. 13 illustrates the coordinate references for the groove camera image including the groove vanishing point relating to the x-axis projection.

[0026] FIG. 14 illustrates an angular coordinate system for a master key.

DETAILED DESCRIPTION OF THE INVENTION

[0027] Reference will now be made in detail to exemplary embodiments of the present invention, examples of which are illustrated in the accompanying drawings. It is to be understood that other embodiments may be utilized and structural and functional changes may be made without departing from the respective scope of the present invention.

[0028] A system and method for identifying a key blank are provided. The system (“key ID system”) analyzes a master key to be duplicated, such as a house key, car key or other key, and determines the appropriate key blank to be used in duplicating the master key. The system and method described herein may be used independently to determine a proper key blank, or may be used in conjunction with other systems to narrow the field of prospective key blanks. Moreover, it will be understood that existing key identification systems may be modified or retrofitted to implement some or all features described herein.

[0029] The key ID system may scan a master key to determine traits and characteristics of the master key. Based on these characteristics, the key ID system may then determine the proper key blank to be used to duplicate the master key. The key ID system may include any means known in the art for determining the traits and characteristics of the master key geometry. For example, the key ID system may include an imaging system, such as a camera,

laser, or any other imaging system known in the art. The imaging system may scan the master key to determine characteristics of the master key, specifically characteristics that may be unique to a specific key blank. While the key ID system is described herein as including an imaging system, it will be appreciated that other known methods or devices, such as electrical or mechanical sensors, may be used in place of or in conjunction with the imaging system to determine the traits and characteristics of the master key geometry.

[0030] With reference to FIG. 1, a master key 10 is depicted. The master key 10 may include standard key features such as a head 16 connected to a blade 18 and a groove 11. The groove 11 may comprise a channel, opening, geometric shape, or other indentation formed in the blade 18. A master key 10 may include a single groove 11 on one side of the blade 18, a single groove 11 on each side of the blade 18, multiple grooves 11 on either side of the blade 18, or any other configuration of grooves 11 with respect to the blade 18. Further, it will be appreciated, that the master key 10 may be any key and is not limited to keys having a head 16, blade 18 or groove 11.

[0031] The key ID system may include a key holder to hold the master key. The key holder may be any device capable of holding or supporting a master key. For example, as shown in FIGS. 2a and 2b, the key holder 13 may comprise a lower support 15 and an upper door 12 to close onto the key. The key holder may alternatively comprise a clamp, gripper, platform, suspension, or any other device configured to hold the master key 10.

[0032] In an embodiment, the key ID system includes a camera system. The camera system includes one or more cameras configured to record images, such as digital images, of the master key. The camera system may further include other components to assist in recording images of the master key, such as lights and mirrors. The lights may be positioned to enhance the clarity and quality of the image recorded by the camera. The mirrors may be positioned to allow a camera in a first position to record an image of the key from a second position. The

mirrors may further allow a single camera to record multiple images of the master key from different angles, thereby increasing the amount of information related to the master key recorded by a single camera.

[0033] The key ID system may include a logic to analyze images captured by the imaging system. As used herein, the term “logic” includes but is not limited to a software, a firmware, an executable program, a hardware or hard-wired circuit, or combinations thereof. For example, based on a desired application or needs, a logic may include a software controlled microprocessor, discrete logic like an application specific integrated circuit (ASIC), an analog circuit, a digital circuit, a programmed logic device, a memory device containing instructions, or the like. Logic may include one or more gates, combinations of gates, or other circuit components. Logic may also be fully embodied as software. Where multiple logical logics are described, it may be possible to incorporate the multiple logical logics into one physical logic. Similarly, where a single logical logic is described, it may be possible to distribute that single logical logic between multiple physical logics.

[0034] The logic may be configured to determine a correlation or likelihood of a match between a known key blank and the master key. For example, the logic may include a database to store key related information (“key data”). The key data may include characteristics of known key blanks, such as length, shape, biting information, size, shape and location of key grooves, and other geometric and physical characteristics of known key blanks. The database may be integral with the logic, in communication with the logic, or remotely accessible to the logic. The database may associate key data with specific key blanks or with types or groups of key blanks. For example, the database may associate key data with specific key manufacturers or different types of keys such as house keys or car keys. The key ID system may access the database to compare scanned characteristics of the master key with the stored key data in the database. Key blanks that do not have

characteristics consistent with those of the master key may be then ruled out as possible matches for the key blank. The key ID system may scan the master key 10 one or more angles and compare the scanned data with stored key data.

[0035] The key ID system may scan a master key 10 to determine information related to the groove 11. Keys and key blanks commonly include a groove 11 or grooves 11 in the blade 18 of the key. Characteristics of the grooves 11 may be unique to a given key blank or group of key blanks. For example, the size, location, angle, and other geometric parameters of a given groove may be unique to a key blank or blanks. Further, the location of a groove 11 on a first side of the key blade (“top groove”) may be unique with respect to the location of a groove 11 on the second side of a key blade (“bottom groove”).

[0036] The key ID system may analyze various aspects of the groove 11 of a master key 10. For example, the imaging system may capture an image of the groove 11 from a position perpendicular to the key blade 18, as illustrated by the overhead camera 20 in FIG. 2a. This camera angle provides a top view of the blade 18 and allows the overhead camera to scan the length of the groove 11. The imaging system may also capture an image of the groove 11 from the end of the tip 14 at an angle parallel to the blade 18. This angle provides a view of the groove 11 cross-section. However, neither overhead scanning of the groove 11 nor parallel scanning of the groove 11 provide sufficient contrast between the groove 11 and the rest of the key 10 to effectively determine certain parameters of the groove 11.

[0037] In many keys, a groove 11 extends from the shoulder 16 through the tip 14 of the key 10. Therefore, the shape and contours of the tip geometry reflect characteristics of the groove 11. Accordingly, unique characteristics of a master key may be determined by scanning the tip 14 from an angle designed to capture the top groove or bottom groove characteristics. This may be best accomplished by scanning the tip 14 at an angle other than perpendicular or parallel to the blade 18. For example, as shown in FIG. 2a, the key ID

system may include a camera 22 facing the tip 14, and positioned at an angle slightly above parallel to the blade. In an embodiment, the camera is positioned facing the tip of the key 10, between 5 and 15 degrees from parallel to the blade of the key 10. This positioning allows the camera 22 to capture the contours of the tip 14 formed by the bottom groove 11. Alternatively, it will be appreciated that the camera may be positioned similarly underneath the key to capture the contours of the tip 14 formed by the top groove 11. As illustrated in FIG. 3, the camera 22 may capture a silhouette of the bottom groove. This silhouette may be unique to a key blank or group of key blanks, thereby narrowing the field of prospective key blanks.

[0038] It will be appreciated that configurations other than the camera configuration shown in FIG. 2a may be used to capture the tip-groove geometry. For example, the key ID system may include only a groove camera 22 without any overhead camera 20. Further, the key ID system may include a plurality of mirrors to allow a single camera at a remote position to capture multiple angles of the master key, including angles of the tip 14. In an embodiment, as shown in FIG. 4, a first mirror 30 may be positioned to provide a top view of the tip 14 from behind the key 10. A mirror may be similarly positioned below and behind the key 10 to capture an image of the bottom groove 11. This view allows the camera to capture the contours of the tip 14 formed by the top groove 11. A second mirror 32 may also be positioned to provide a top view of the tip 14 from in front of the key 10. This view allows the camera to capture the contours of the tip 14 formed by the bottom groove 11. It will be appreciated that the key ID system may include any number of cameras, mirrors, and other imaging devices to capture the desired views of the contours of the tip 14.

[0039] In an embodiment, the key ID system scans the master key 10 to capture the silhouette of the blade 18, as shown in FIG. 5. This silhouette is used to determine the outline shape of the tip 14 in order to isolate groove geometry from the tip geometry. The key ID

system may also scan the tip 14 from an angled position to capture the contours of the tip 14 formed by the groove 11.

[0040] As shown in FIG. 6, a trigonometric projection of the tip 14 may be used to identify the portion of the tip contour that is due to the groove shape. Specifically, contour data related to contours of the groove 11 may be determined by calculating a set of scalar variables based on image information and machine constants. As described herein, points in the image taken by the overhead camera 20 are mapped to their corresponding points from the image taken from the groove camera 22.

[0041] The contour image may be compiled from data obtained by the overhead or outline camera 20. Once the outline or contour data has been generated, the outline image is rescanned to generate a set of data points, as shown in FIGS. 7-9. For example, data points may be generated every .005 inches along the tip of the key. The data point interval of the rescanned or resampled image may be adjusted based on the required accuracy for groove identification and the optical characteristics of the outline and groove cameras. For example, the data point interval may be 0.002 in order to obtain a better defined sample.

[0042] The groove contour may be compared to contours of known key blanks stored in the database to determine a matching key blank. Tolerance and/or correlation values may be set to determine if the comparison yields a match. FIG. 8 illustrates a comparison between a scanned key tip contour and stored key data of a known key blank. The statistical correlation value between the data sets is approximately .985, indicating a match between the master key and compared key blank. FIG. 9 illustrates another comparison between a scanned key tip contour and stored key data of a known key blank. The statistical correlation value between the data sets here is approximately .879, indicating that the master key and compared key blank do not match.

[0043] Referring to FIG. 2a, the plane of the overhead camera 20 image intersects the groove camera 22 image at the lower edge of the door opening 12. The overhead camera 20 observes the profile of the key 10 while the groove camera 22 is focused on the tip of the key 10. With reference to FIGS. 10-13, the line at which these two images intersect, referred to as the door axis 52, is a primary axis for purposes of determining contour data. The primary reference or origin point of the door axis is located at the center of the door 12. The plane of the door also passes through this intersection and is by definition perpendicular to the overhead camera 20 image plane.

[0044] A silhouette image of the key 10 may be captured by the groove camera 22. To capture the silhouette image, the key ID system may utilize elements such as a light source 24 and a diffuse reflector element 26, as shown in FIGS. 2a and 2b. The light source 24 may be shielded with a light shield 28 to illuminate the reflector element 26 while avoiding the tip of the key 10. In an embodiment, the directional light from the light source 24 is angled to direct the light substantially on the diffuse reflector element 26, but not on the tip of the key 10.

[0045] The light source 24 may be any light source known in the art. For example, the light source 24 may be a series of discrete LED lights substantially oriented in a row. It will be appreciated, however, that the light source 24 may be any lights arranged in any configuration. The diffuse reflector element 26 may be affixed to the interior surface of the door, such that when the light from the light source 24 strikes the diffuse reflector element 26, the diffuse reflector element 26 provides a backlit area. In other words, this arrangement provides a backlit area behind the key 10 with respect to the groove camera 22 while minimizing the amount of light that is directed toward the key 10. Thus, the groove camera 22 may view the key 10 tip as a substantially dark or black feature, similar to that shown in Fig. 3. It will be appreciated, however, that the key ID system may include any additional lights, such as backlights, positioned throughout the system.

[0046] With reference to Fig. 2b, an alternative configuration for the key ID system is shown. The groove camera 22 may be mounted in a vertical camera box 23. The vertical camera box 23 mounts the groove camera 22 at the bottom directed upward toward a mirror 25 mounted at the other end of the vertical camera box 23. The mirror 25 is directed toward the key 10 tip, such that the angle of incidence is nominally about 15 degrees. However, it will be appreciated that the angle of incidence upon the key 10 of the image may be any angle, preferably between approximately 5 degrees and approximately 45 degrees.

[0047] The key 10 is not constrained to a particular orientation or position when held within the key holder 13. With reference to FIG. 14, the key may be tilted or yawed in a plane perpendicular to the orientation of the outline camera 20; tipped up or down relative to the plane defined perpendicular to the door opening 12; and rotated around the axis of the key blank it self (rolled) or combinations of any of the preceding as well as variations caused by the overall length of the key blade 10 that would position the tip of the key at various focus positions relative to the groove camera 22. Thus it is necessary to correct for the optical distortions and transform the images obtained from the two different cameras to obtain an effective image of the tip 14.

[0048] The concept of a vanishing point is used to handle the foreshortening of the key 10 when viewed by the groove camera 22. The effects of this foreshortening vary greatly as the end of the key 10 is tipped up or down slightly by the clamping action of the door 12. The distance from the door to the vanishing point may be substantially affected by this tipping action.

[0049] To compensate for the angle between the groove camera 22 and the key 10, the distance from the tip of the key to the door axis is readily determined for both the overhead camera 20 image and groove camera 22 image. The ratio of these distances (hereinafter “GrooveLR”) is dependent both on the angle between the groove camera 22 angle and the

key tipping angle. The actual values of these angles may be ignored because only the ratio is required for the calculations to compensate for the key location.

[0050] In an embodiment, a groove image vanishing point may be determined by multiplying the distance to the outline image vanishing point by the ratio $GrooveLR$. The outline image vanishing point may first be empirically determined. For example, previous test indicate a sample outline image vanishing point to be 20 inches from the origin of the door axis. The outline image vanishing point depends on the configuration of the key ID system and the characteristics of the cameras. Vanishing points may be assumed to be on the door centerline axis. However, in other embodiments vanishing points may be offset from the door centerline axis with additional compensation.

[0051] FIGS. 10-13 illustrate a crop box 50 used for limiting the image of the key 10. An example of an outline crop box 50 is shown in FIG. 5, where the outline crop box 50 defines the outer periphery of the image. The outline crop box functions to limit the image that is actually processed by the system, even though the actual image captured by the camera is larger than the outline crop box 50. The outline vanishing point is far to the left of the outline crop box 50 along its X axis shown as point 52. The groove vanishing point is above the groove crop box 60, shown in FIG. 6, along its Y axis at point 62. The groove crop box 60, serves a similar function to the outline crop box 50, namely it reduces the overall image processed by the system to a subset of the actual image captured, in this case by the groove camera 22. This outline image vanishing point distance is combined with $vOutX$ to calculate the x axis distance from the vanishing point to the starting point. While a specific method determining the vanishing points and associated distances is described, it will be appreciated that other methods may be used.

[0052] FIG. 10 shows the position of the starting location relative to the door axis and the Outline Camera image. $vOutX$ and $vOutY$ are the x and y coordinates of a point at the tip of a

key image that is to be mapped to the groove image. These points correspond to the set of data points that define the tip of the key. The units of the outline camera 20 are in pixels. Thus a series of vOutX and vOutY points are created to define the tip of the key.

[0053] FIG. 11 shows the starting point translation to distances from the outline view vanishing point. This distance is multiplied by GrooveLR to yield the outline VPy shown on Fig. 11 and referred to as GVPY (groove image vanishing point distance).

[0054] FIG. 12 shows the construction of the projected tip point y axis coordinate. This projection is made on the Groove Camera image plane. The y axis projection is simply the difference between GVPY and GrooveVP.

[0055] The x axis projection calculation uses the GVPY to GrooveVP ratio as shown in FIG. 13. The Groove Door X distance may be determined from the outline image. The Groove Door X distance may be scaled by the GVPY to GrooveVP ratio and added to the Groove Crop Box Center distance to find gsx which is the x axis coordinate. A trim value may be added to enable small physical offsets to be adjusted during machine calibration.

[0056] Once each point on the outline camera 20 image has been mapped to the groove camera 22 image, the groove contour data may be determined. FIG. 6 shows a typical groove image with two rows on points drawn at its tip. The row that is touching the tip may be calculated using the method described here. The lower row may be extrapolated from the same data points.

[0057] The groove contour is found by measuring the distance from a point that is eight pixels below the mapped point to the actual white to black edge in the groove image. Giving the edge detection software the extra pixels allows it to readily find a transition and allows for small errors if the mapped points are slightly above the actual transition. The set of these distances forms the groove contour.

[0058] Various tip shapes and bittings near the tip of the key may affect the image of the grooves as seen by the groove camera 22. Therefore, it may be helpful to manipulate the groove data in an attempt to compute how the grooves would appear if the key blade was cut off square. To accommodate this manipulation, a scan of the outline data (from the outline camera 20 image) along the tip of the key may be performed with respect to a series of lines that are parallel with the axis of the key. This yields a series of measurements that determine the distance from the edges of the tip of the key to some arbitrary squarely cut edge. These measurements may then be translated to the groove camera 22 image using a process described below. These translated key tip points 62 in the groove image 60 represent the tip of the key as if there were no grooves in the key. Differences between these points and the observed edge of the tip of the key in the groove image 60 represent the actual shape of the grooves as if the key blade was cut off square.

[0059] The final task of blank identification is to match the measured contour with the stored characteristics. The type of key 10 may be used to help match the contour with the appropriate data set. For symmetrical double sided keys the direction of the key insertion into the key identification system is irrelevant because the grooves and other features are symmetrical so a single characteristic reference image is stored for those symmetric keys. For most single sided keys, both sides of the key (referred to as left and right) are distinctive. In those cases, the characteristic reference images for each key includes a left and right view. When performing comparisons, right cuts are only matched to data for single cut blanks and only right cut data for those blanks. The data is also aligned so the key reference sides (e.g. in the case of a single sided key, the flat of the blank) are near each other. Often cut key data has many fewer data points so it is assumed data points opposite the reference side is where the metal (and data) have been removed. Double cut keys are matched based on the centerlines.

[0060] A series of comparisons may performed between the characteristic reference image that is stored in the database and the actual captured image to compensate for small registration errors. The comparison may be performed via a 2-D correlation analysis described in greater detail below. Specifically, the data may be moved a few data points in each direction. These points may then be compared and analyzed with the best result being chosen as the correct data point.

[0061] Small errors in image registration and performing the transpositions between the images can cause the contour data to be sloped up or down. This is called “roll” and is similar to an airplane roll where the wings are not level. Some level of roll is presumed to be dependent on unique machine set up details. To compensate for this roll, each key ID system may have a roll constant that is used to adjust its measured values. This insures that biases are not a factor when compared to stored data sets that were generated on other machines.

[0062] There also may be roll based on individual key scans. A second roll test may be used to insure the best possible match after the machine roll has been accounted for, and the best horizontal sliding position has been determined. Each comparison is done for as many as 40 different roll values to determine the best match. These calculations assure the comparison is done as accurately as possible. In other embodiments, larger numbers of roll values may be used to handle greater variation in the image captured by the groove camera 22.

[0063] Mathematical correlation may also be as the basis of contour comparison. The correlation may be done based on a standard formula. However, if a data point in the newly collected data or stored data is potentially in error it may be excluded from the correlation calculation. The actual data may have values larger than one as we begin the scan for groove edge data 8 pixels below the first expected transition point. Alternatively, different pixel offsets may be used based on the likelihood of erroneous data. If this data is set to -1 that point is excluded from the calculation. Some stored data is manually set to -1 to compensate

for scan errors and to de-emphasize some features of the contours. Errors in edge detection can cause -1 values in the newly scanned data.

[0064] Other methods may be employed to compare the tip image to the reference contours. One method is to fit the contour inside an envelope based on the stored contours. Other techniques taking advantage of various basis functions are also suitable for performing the comparisons between the characteristic reference images and the captured image in order to obtain a match as well.

[0065] A secondary test may be added to the standard correlation calculation. Some key blanks have the same overall pattern of grooves, but the groove depths are exaggerated on some blanks more than others. Since correlation may be insensitive to scale, these blanks may be found to match even where there are large differences in actual groove depths. A second factor based on the standard deviation of the two contour data sets is used to aid in this differentiation. The factor is calculated by taking the difference between the two standard deviations and dividing it by the sum of the two values. This value is then subtracted from the correlation coefficient and a secondary test is performed. The resulting correlation results are used to provide an estimate as to which type of key is inserted into the key ID system. In an embodiment, the correlation results are used in conjunction with the key outline characterization to further narrow and reduce the type of key identified.

[0066] Both the standard correlation value and the adjusted correlation value are unitless and non-scaled numbers between 0 and 1. In order to provide more meaning to the values, each is rescaled to a scoring system of 0 to 100% where 0 is considered to be an impossible match and 100 is a perfect match. In an embodiment, standard correlations of 0.60 to 1.0 are rescaled to a score of 0 to 100% and adjusted correlations of 0.50 to 1.0 are rescaled to a score of 0 to 100%. Any correlations of less than the 0.60 and/or 0.50, respectively, are

considered to be impossible matches. The total groove scanning score or correlation score may be a weighted average of these two individual scores.

[0067] The key ID system as described may be used in conjunction with other known key identification systems. For example, the key ID system may be used in conjunction with user interface identification systems, such as the object identification system disclosed in U.S. Publication No. 2004/0095380 and the key duplication system disclosed in U.S. Publication No. 2007/0224008, each of which are hereby incorporated by reference in their entirety.

[0068] The invention has been described above and, obviously, modifications and alternations will occur to others upon a reading and understanding of this specification. The claims as follows are intended to include all modifications and alterations insofar as they come within the scope of the claims or the equivalent thereof.

CLAIMS

What is claimed is:

1. A key identification system comprising:
an imaging system including a camera configured to capture an image of a master key, wherein said image includes a contour;
a reflecting device positioned in alignment with said camera for capturing said image;
a logic configured to analyze said captured image to determine characteristics of said contour and compare said characteristics with characteristics of known key blanks to determine the likelihood of a match between said master key and a known key blank; and
wherein said logic accounts for positional variations of said master key with respect to said imaging system to determine characteristics of said contour.
2. The key identification system of claim 1, wherein said logic includes a database containing data related to characteristics of grooves of known key blanks.
3. The key identification system of claim 1, wherein said imaging system includes a light.
4. The key identification system of claim 3, wherein said light is directed toward said reflecting device.
5. The key identification system of claim 4, wherein said light includes a shield to direct light away from said master key.
6. The key identification system of claim 1, wherein said captured image is a digital image.
7. The key identification system of claim 1, wherein said captured image comprises a silhouette of said tip of said master key.

8. The key identification system of claim 1, wherein said positional variations include rolling of said master key with respect to said imaging system to determine characteristics of said contour.
9. The key identification system of claim 1, wherein said positional variations include tilting of said master key with respect to said imaging system to determine characteristics of said contour.
10. The key identification system of claim 1, wherein said positional variations include tipping of said master key with respect to said imaging system to determine characteristics of said contour.
11. The key identification system of claim 1 wherein said captured image comprises a silhouette of the blade of said master key.
12. The key identification system of claim 1, wherein said characteristics of said contour are determined based on image data from at least said two or more views of said master key.
13. The key identification system of claim 12, wherein said logic calculates the geometry of the contour as seen from a view of the tip parallel to the blade based on data from at least said two or more views of said master key.
14. The key identification system of claim 12, wherein said logic calculates the geometry of the contour as though the tip were squarely cut based on data from at least said two or more views of said master key.
15. The key identification system of claim 1 further comprising a key holder configured to hold said master key.
16. The key identification system of claim 15, wherein said key holder includes a clamp.
17. The key identification system of claim 1, wherein one of said views of said master key includes a view from above the master key blade of a groove in the bottom of said blade.

18. The key identification system of claim 1, wherein one of said views of said master key includes a view from an angle between perpendicular and parallel to the blade of said master key and not including perpendicular or parallel to the blade of said master key,
19. The key identification system of claim 1, wherein the logic is configured to shift data related to said characteristics of said contour to compare with said known key blank characteristics.
20. The key identification system of claim 1, wherein said logic includes a tolerance range for each characteristic of said master key to determine whether a master key passes or fails to match a known key blank.

ABSTRACT

A key identification system is provided. The key identification system comprises an imaging system to capture an image of a master key, and a logic to analyze the captured image. The imaging system may be capture an image of a groove in the master key from an angle between perpendicular and parallel to the blade of said master key. The logic analyzes the captured image to compare characteristics of the groove with groove characteristics of known key blanks to determine the likelihood of a match between the master key and a known key blank. The key identification system may further compensate for displacement or orientation of the master key with respect to the imaging system when analyzing characteristics of the groove.



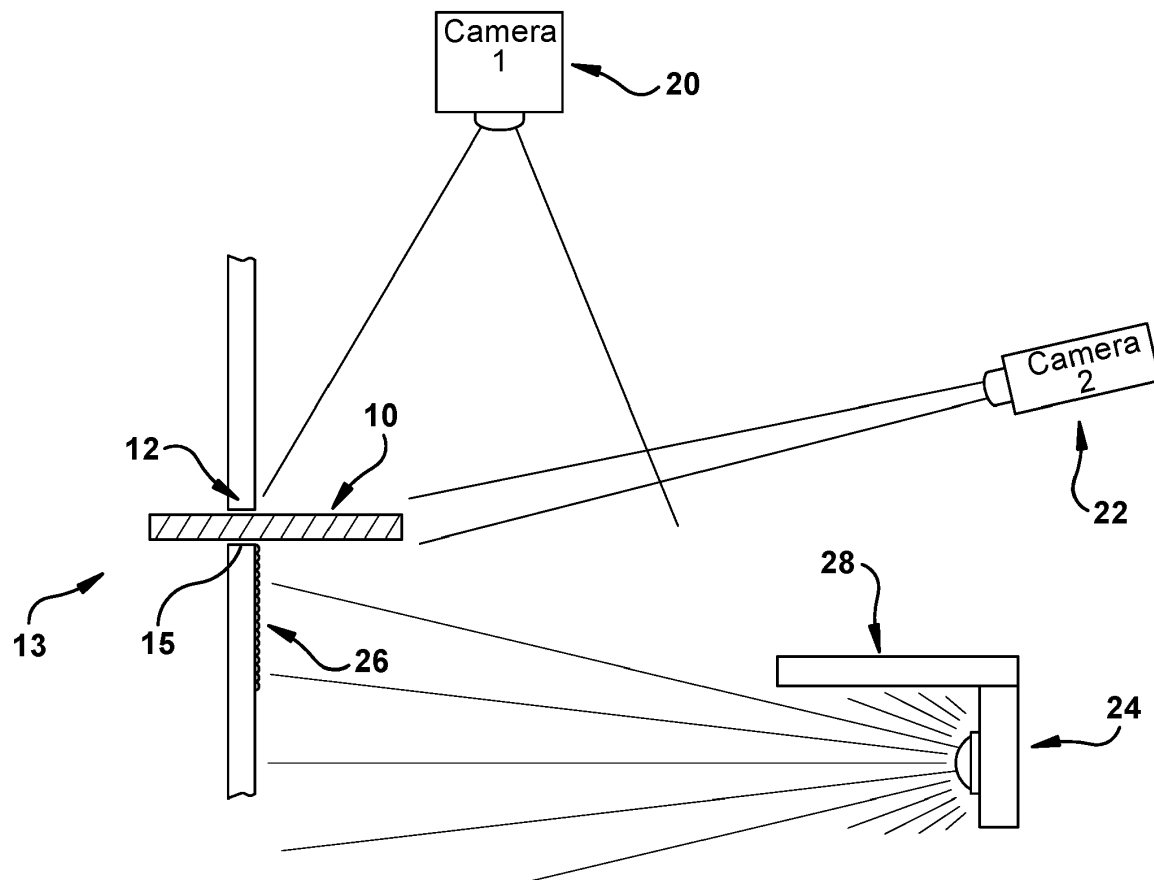
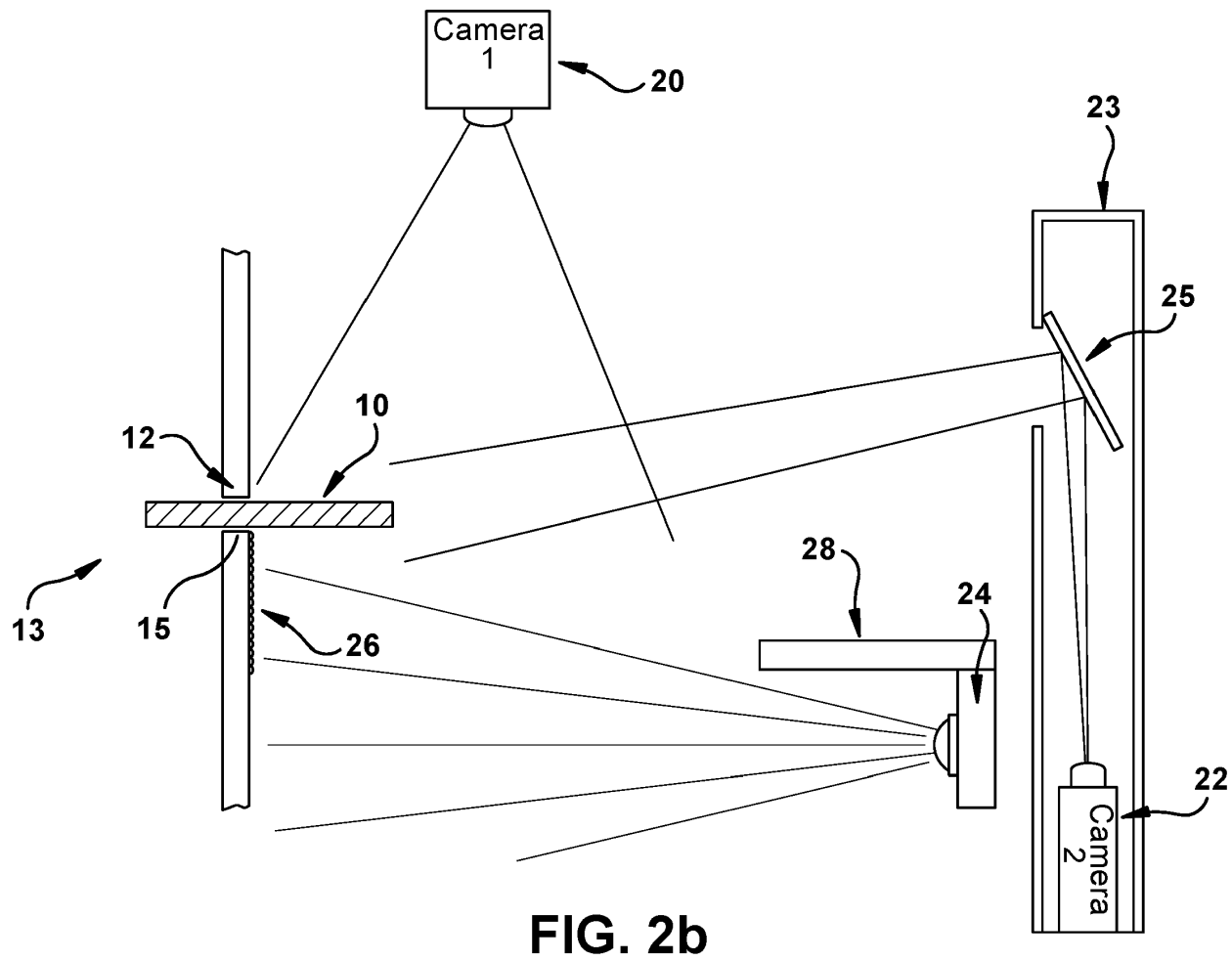


FIG. 2a



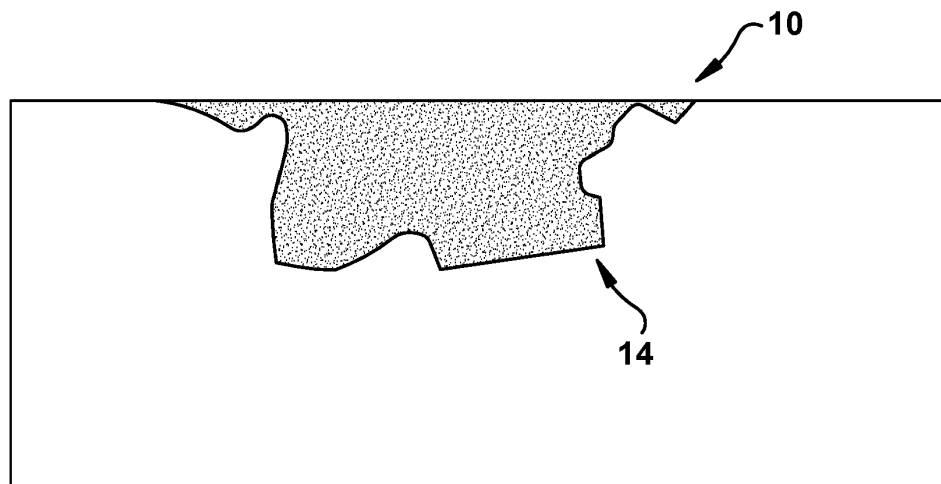
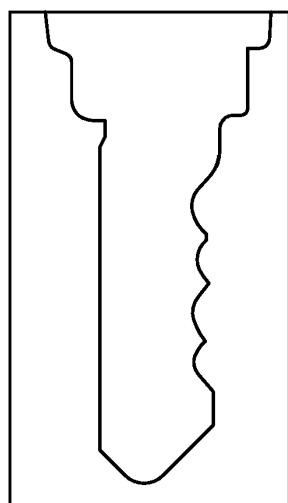
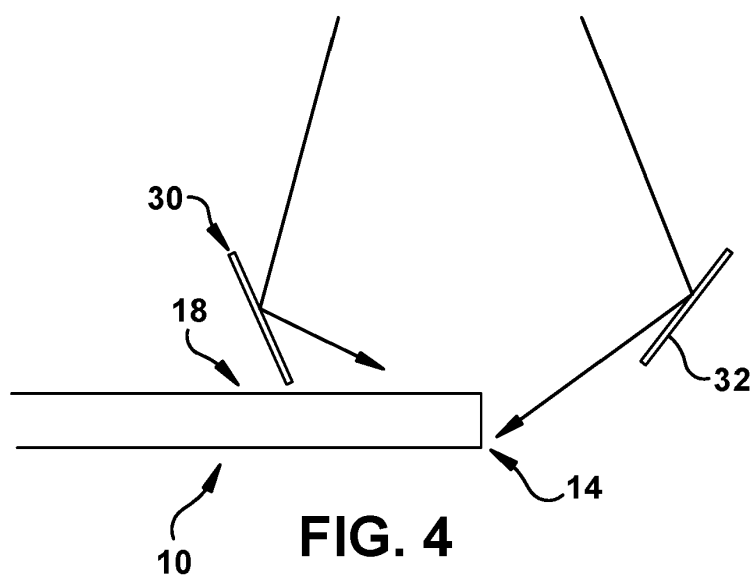


FIG. 3



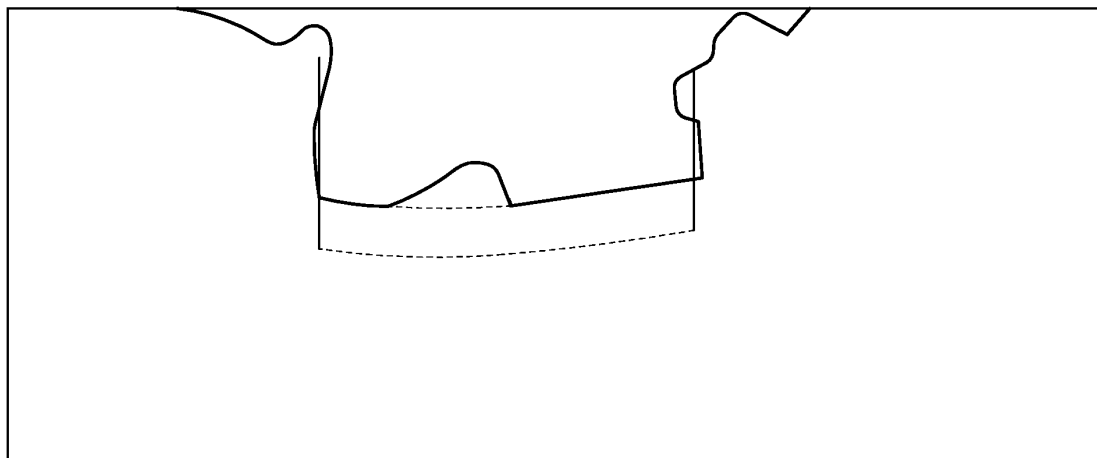


FIG. 6

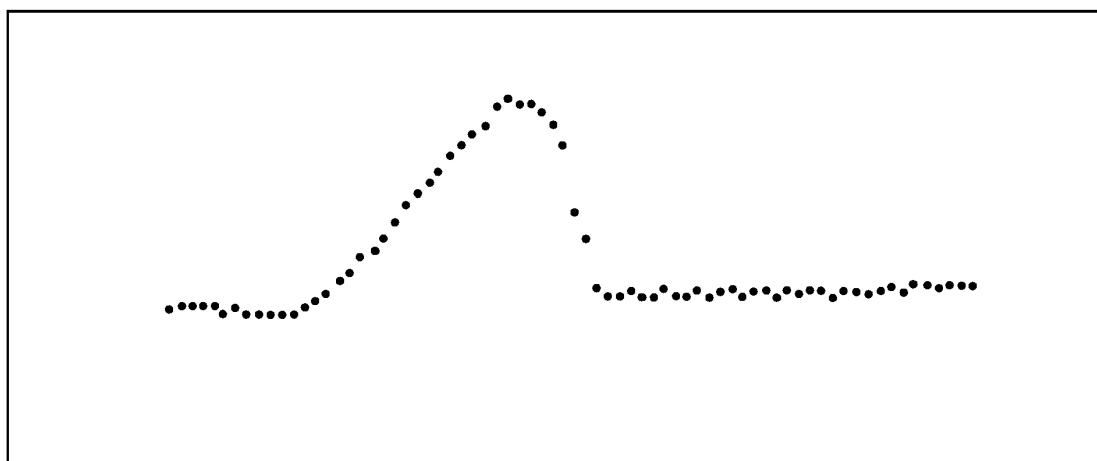
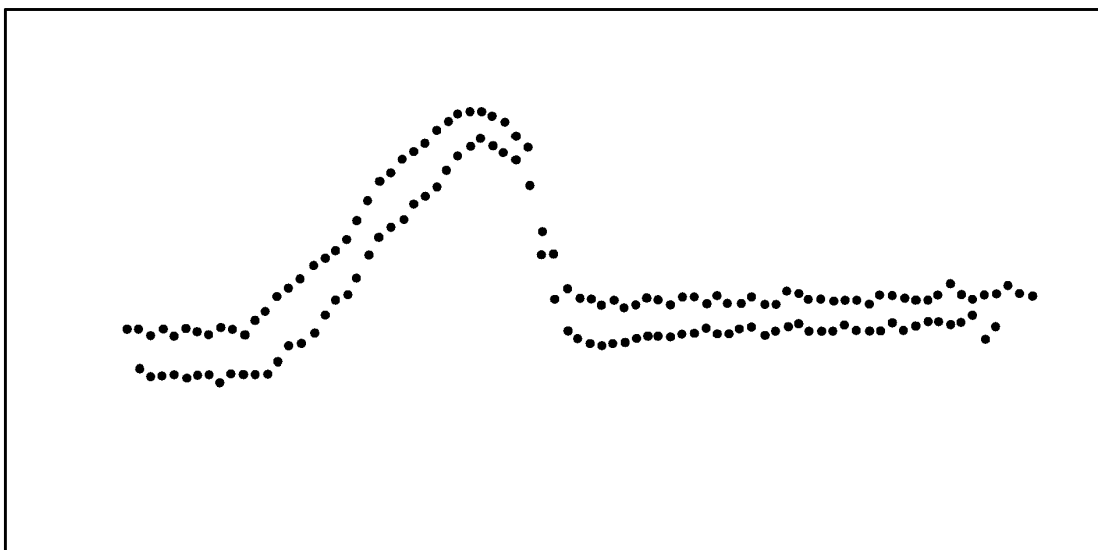
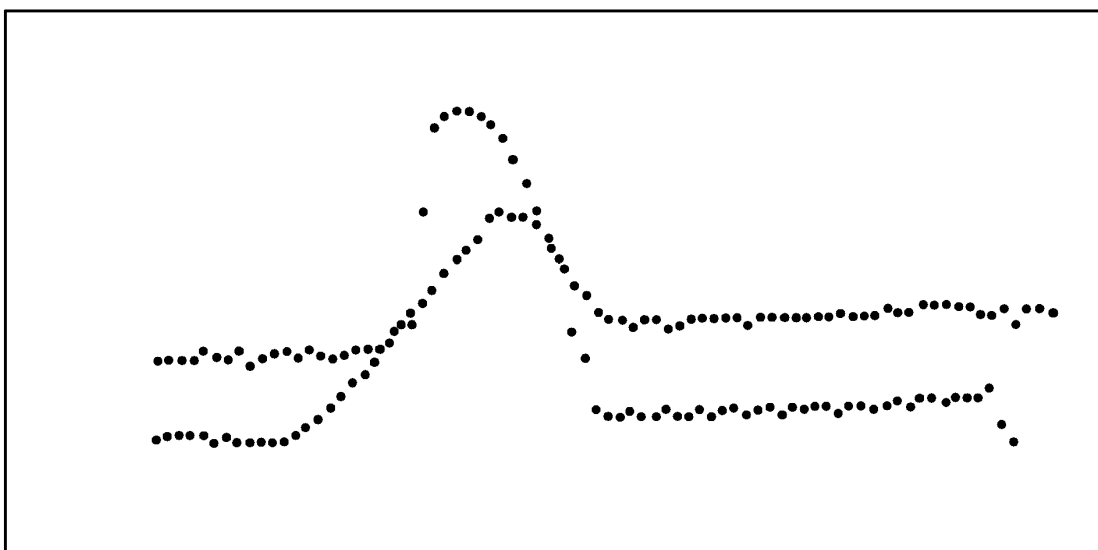


FIG. 7

**FIG. 8****FIG. 9**

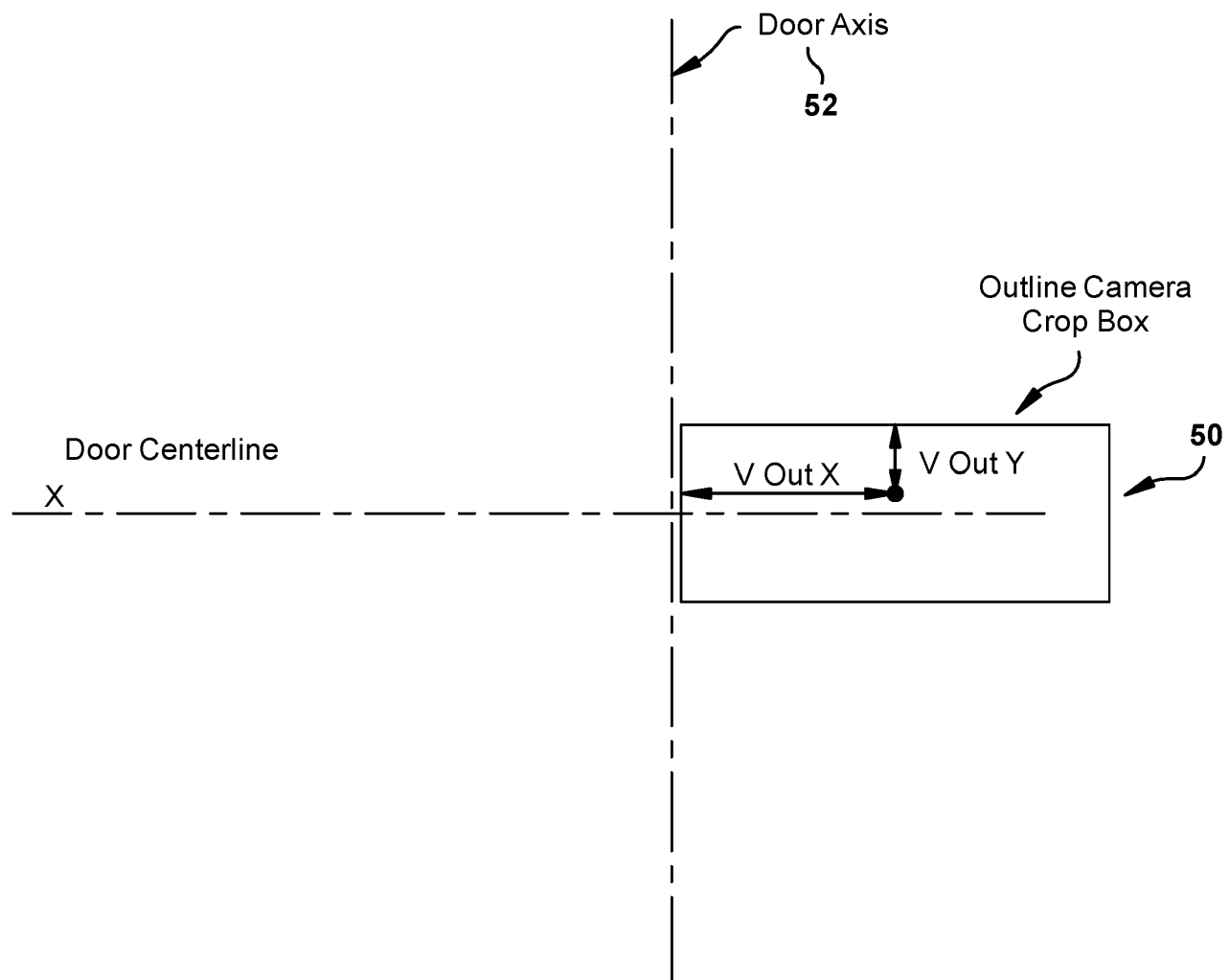


FIG. 10

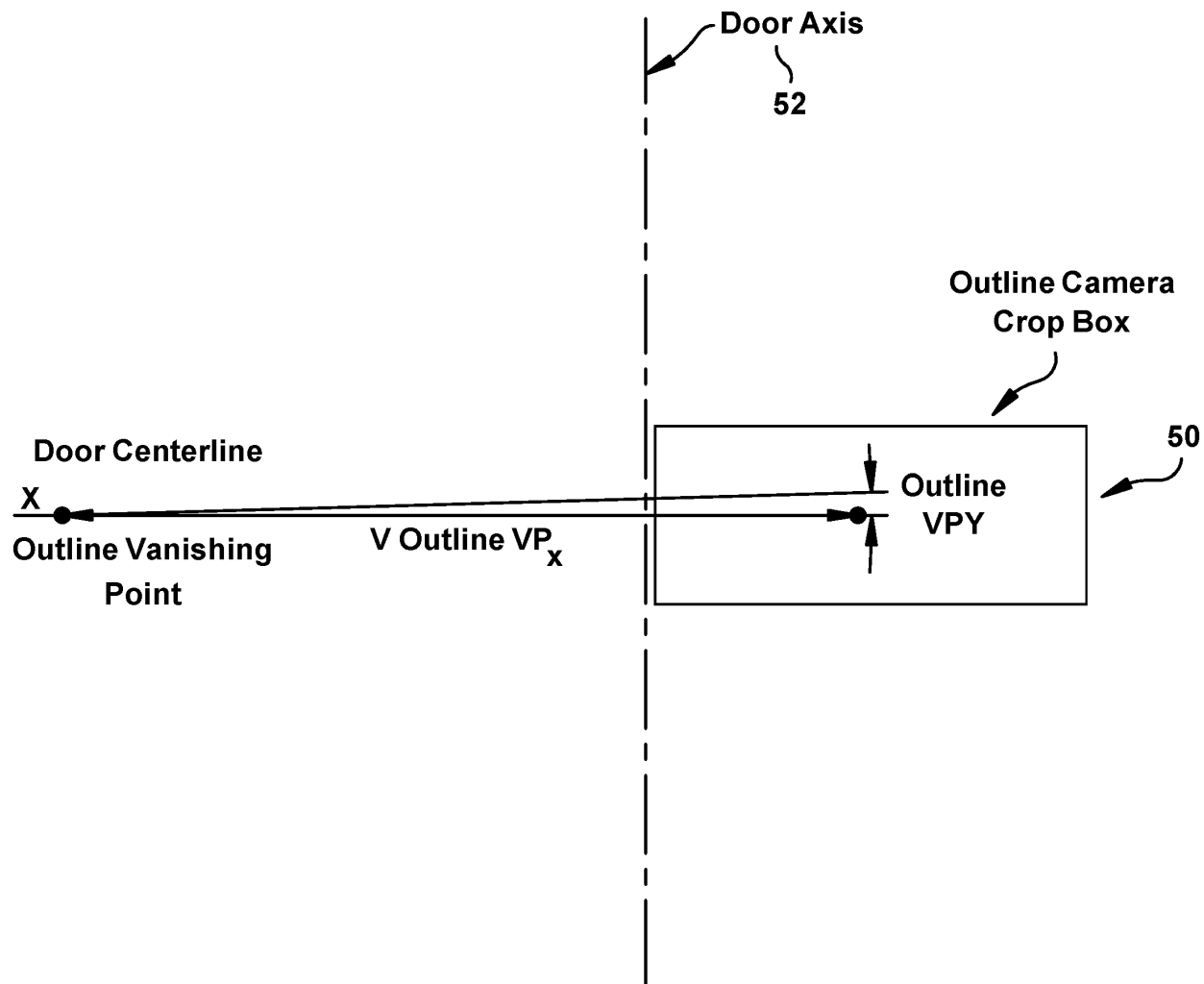
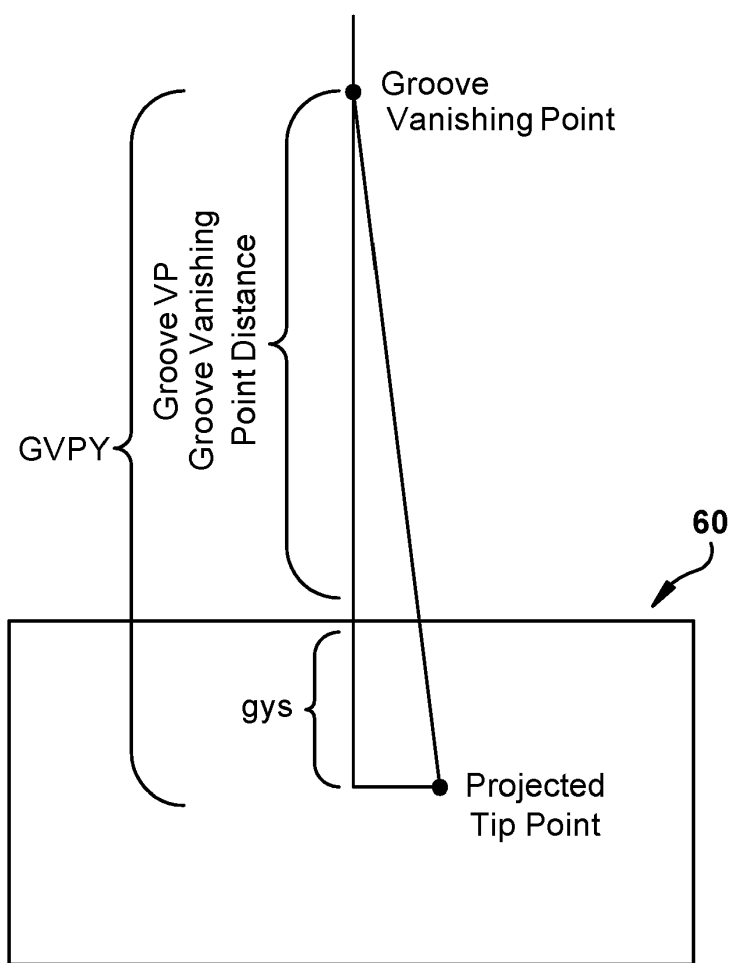
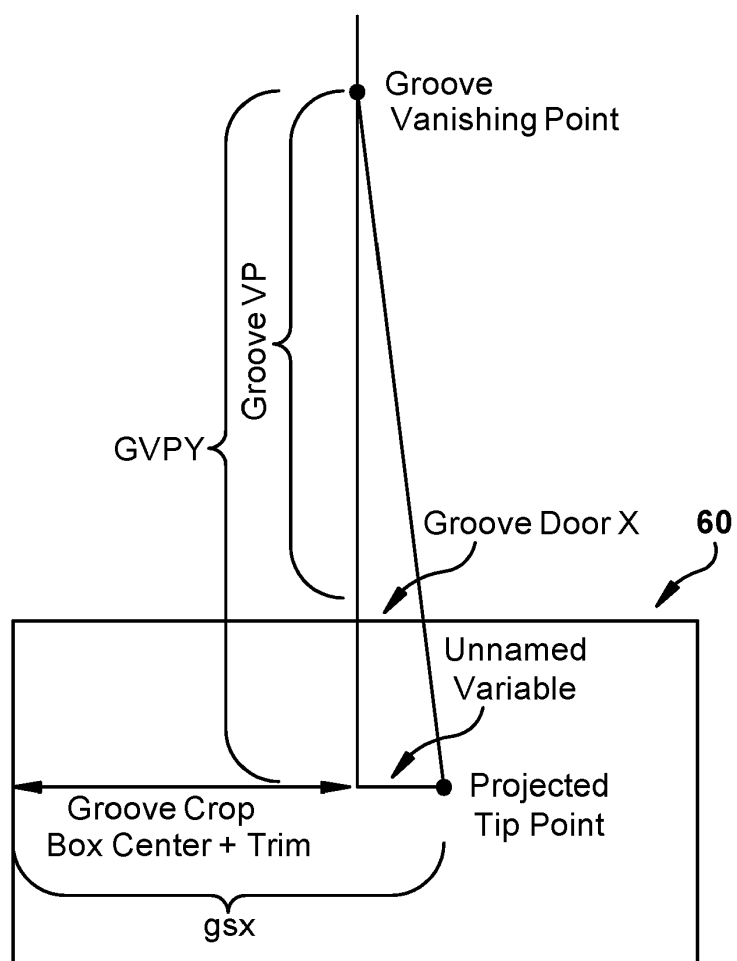
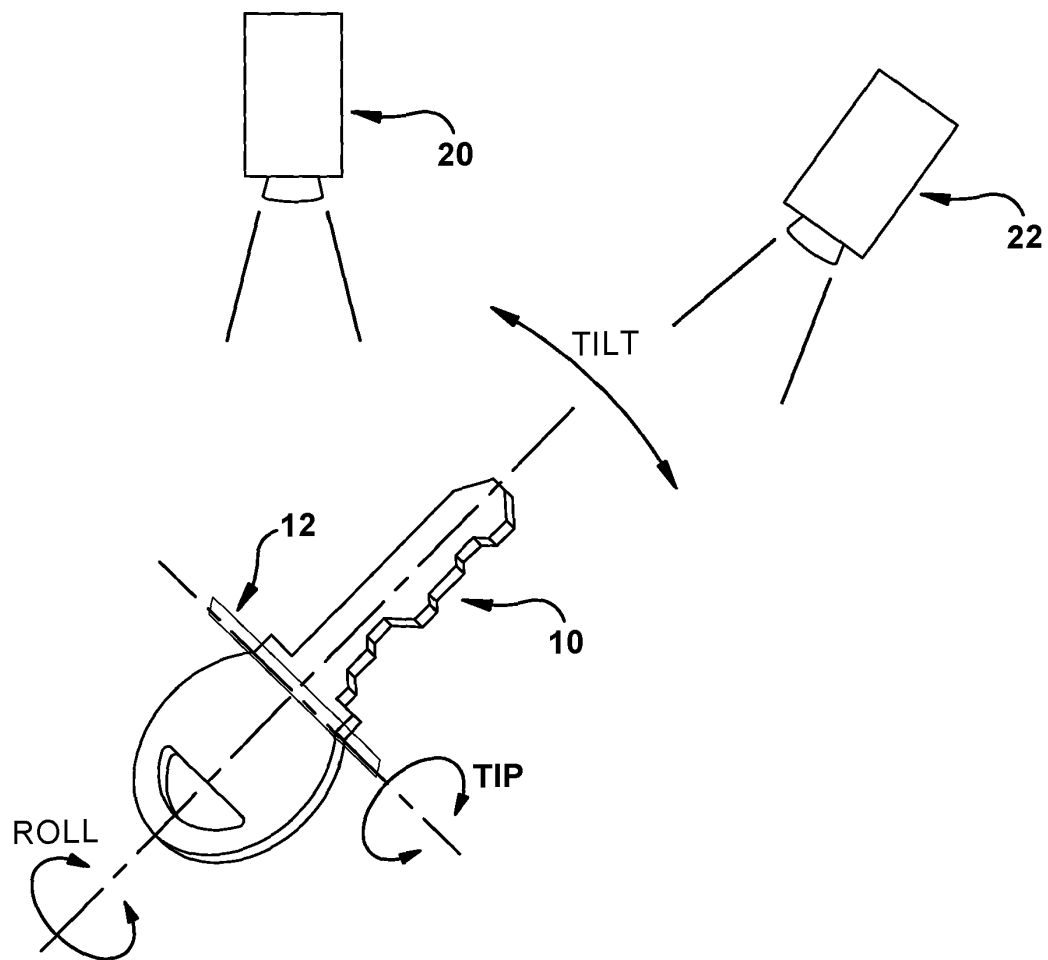


FIG. 11

**FIG. 12**

**FIG. 13**

**FIG. 14**

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	16223-00341
		Application Number	
Title of Invention	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

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☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

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Inventor	1				Remove	
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Address 2						
City	Painesville	State/Province	OH			
Postal Code	44077	Country	US			
Inventor	2				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	William	R.	Mutch			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
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City	North Ridgeville	State/Province	OH			
Postal Code	44039	Country	US			
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☐ An Address is being provided for the correspondence information of this application.

Customer Number	33772		
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Application Information:

Title of the Invention	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING		
Attorney Docket Number	16223-00341	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	12	Suggested Figure for Publication (if any)	1

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not be** the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	33772		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	16223-00341
		Application Number	
Title of Invention	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending					Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)			
	Continuation of	15/351634	2016-11-15			
Prior Application Status	Patented					Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)	
15/351634	Continuation of	14/162157	2014-01-23	9514385	2016-12-06	
Prior Application Status	Patented					Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)	
14/162157	Continuation of	12/772709	2010-05-03	8644619	2014-02-04	
Prior Application Status	Expired					Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)			
12/772709	Claims benefit of provisional	61/275654	2009-09-01			
Prior Application Status	Expired					Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)			
12/772709	Claims benefit of provisional	61/215152	2009-05-01			
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This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)¹ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	16223-00341
		Application Number	
Title of Invention	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING		

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Remove Access Code ^j (if applicable)
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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	16223-00341
		Application Number	
Title of Invention	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

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1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

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☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	16223-00341
		Application Number	
Title of Invention	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.			
Applicant	1	Remove	
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.			
Clear			
Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor	
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If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
Name of the Deceased or Legally Incapacitated Inventor:			
If the Applicant is an Organization check here. ☒			
Organization Name	HY-KO PRODUCTS COMPANY		
Mailing Address Information For Applicant:			
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Address 2			
City	Northfield	State/Province	OH
Country	US	Postal Code	44067
Phone Number		Fax Number	
Email Address	ipmailbox@mcdonaldhopkins.com		
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		Application Number	
Title of Invention	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING		

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Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
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Address 2				
City		State/Province		
Country i		Postal Code		
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Signature:

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See 37 CFR 1.4(d) for the manner of making signatures and certifications.

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First Name	Mark	Last Name	Masterson	Registration Number
				71886
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	16223-00341
		Application Number	
Title of Invention	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING		

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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.**

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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.

COMBINED ASSIGNMENT AND DECLARATION OF PATENT APPLICATION

Assignment of Patent Application

Whereas, we, Chester O.D. Thompson, having an address at 7377 Amanda Place, Painesville, OH 44077, United States of America; William R. Mutch, having an address at 35284 Nikki Avenue, North Ridgeville, OH 44039, United States of America; hereinafter referred to as "Assignors," have invented, a new and useful invention, for which a U.S. Utility Patent Application was filed on January 23, 2014 having Attorney Docket No.: 16223-00274 and Application Serial No.: 14/162,157; U.S. Utility Patent Application was filed on May 3, 2010 having Attorney Docket No.: 16223-0005 and Application Serial No.: 12/772,709; Provisional Patent Application filed on September 1, 2009 having Attorney Docket No.: 16223-00129 and Application No.: 61/275,654; and Provisional Patent Application filed on May 1, 2009 having Attorney Docket No. 16223-00122 and Application Serial No. 61/215,152 and any subsequent applications filed in connection with the above invention (the "Patent").

Whereas, HY-KO PRODUCTS COMPANY, having an address at 60 Meadow Lane, Northfield, OH 44067, hereinafter referred to as "Assignee," is desirous of acquiring the entire right, title and interest in and to said Patent;

NOW, THEREFORE, in consideration of the sum of ten dollars (\$10.00), and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, we, the Assignors, by these presents do sell, assign and transfer unto Assignee, its successors and assigns, the full and exclusive right to the Patent and all letters patent of foreign countries which may be or have

"KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING"

been issued on the invention disclosed in the Patent, all divisions, reissues, and continuations thereof, and all inventions disclosed therein, together with all claims for damages by reason of past or future infringement, with the right to sue for and collect the same for the use and benefit of Assignee and its successors and assigns.

Assignors warrant that they are the exclusive owners of the entire legal and equitable interest in the Patent and the invention disclosed therein, free and clear of all liens and encumbrances; and that they have full power, authority, and capacity to make this Assignment to Assignee. Assignors covenant and agree, for themselves and for their successors and assigns that, at Assignee's request, Assignors will cause to be executed and delivered any applications, affidavits, assignments, and other instruments as may be deemed necessary or desirable by Assignee to secure for or vest in Assignee, its successors or assigns, all right, title, and interest in and to any application, patent, or other right or property covered by this assignment, including the right to apply for and obtain patents in foreign countries under the provisions of the International Convention; and Assignors hereby request and authorize the United States Commissioner of Patents and Trademarks to issue any and all United States patents granted on the Patent to Assignee as owner of the entire right, title, and interest in and to the same, and authorizes appropriately empowered officials of foreign countries to issue any letters patent granted on the Patent to Assignee as owner of the entire right, title, and interest in and to the same.

Declaration (37 Cfr 1.63) For Utility Or Design Application Using An Application Data Sheet (37 Cfr 1.76)

Title of Invention: Key Blank Identification System with Groove Scanning

As the below named inventor, I hereby declare that this declaration is directed to the attached application.

Ref. #16223-00274

"KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING"

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in 37 CFR §1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

[Signature pages follow.]

Ref. #16223-00274

"KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING"

Legal Name of Inventor: Chester O.D. Thompson

By: 
Chester O.D. Thompson

Date: February 22, 2014

Ref. #16223-00274

"KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING"

Legal Name of Inventor: William R. Mutch

By: WR Mutch
William R. Mutch

Date: 2/28/14

PATENT COOPERATION TREATY

PCT/US2011/034564

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING
TRANSMITTAL OF COPY OF INTERNATIONAL
PRELIMINARY REPORT ON PATENTABILITY
(CHAPTER I OF THE PATENT COOPERATION
TREATY)
(PCT Rule 44bis.1(c))

To:

CUPAR, David B.
600 Superior Avenue, E. Ste. 2100
c/o McDonald Hopkins LLC
Cleveland, Ohio 44114
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year) 25 July 2013 (25.07.2013)		
Applicant's or agent's file reference 16223-00178P 192		IMPORTANT NOTICE
International application No. PCT/US2011/034564	International filing date (day/month/year) 29 April 2011 (29.04.2011)	Priority date (day/month/year) 14 January 2011 (14.01.2011)
Applicant MUTCH, William R. et al		

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Simin Baharlou e-mail: pt09.pct@wipo.int

Form PCT/IB/326 (January 2004)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 16223-00178P	FOR FURTHER ACTION See item 4 below	
International application No. PCT/US2011/034564	International filing date (<i>day/month/year</i>) 29 April 2011 (29.04.2011)	Priority date (<i>day/month/year</i>) 14 January 2011 (14.01.2011)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant MUTCH, William R.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a). 2. This REPORT consists of a total of 5 sheets, including this cover sheet. In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																										
3. This report contains indications relating to the following items: <table border="0"> <tr> <td>☒</td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td>☐</td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td>☐</td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td>☐</td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td>☒</td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td>☐</td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td>☐</td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td>☐</td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>			☒	Box No. I	Basis of the report	☐	Box No. II	Priority	☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	☐	Box No. IV	Lack of unity of invention	☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	☐	Box No. VI	Certain documents cited	☐	Box No. VII	Certain defects in the international application	☐	Box No. VIII	Certain observations on the international application
☒	Box No. I	Basis of the report																								
☐	Box No. II	Priority																								
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☐	Box No. VI	Certain documents cited																								
☐	Box No. VII	Certain defects in the international application																								
☐	Box No. VIII	Certain observations on the international application																								
4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																										

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70		Date of issuance of this report 16 July 2013 (16.07.2013) Authorized officer Simin Baharlou e-mail: pt09.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: DAVID CUPAR
C/O MCDONALD HOPKINS LLC
600 SUPERIOR AVENUE, E. STE. 2100
CLEVELAND, OH 44114

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year) 15 JUL 2011

Applicant's or agent's file reference
16223-00178P

FOR FURTHER ACTION

See paragraph 2 below

International application No.
PCT/US2011/034564

International filing date (day/month/year)
29 April 2011

Priority date (day/month/year)
14 January 2011

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - B23C 3/35 (2011.01)
USPC - 409/81

Applicant HY-KO PRODUCTS COMPANY

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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

Date of completion of this opinion
08 July 2011

Authorized officer:
Blaine R. Copenheaver
PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2009)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2011/034564

Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	7, 9-10, 13, 21, 23-24	YES
	Claims	1-6, 8, 11-12, 14-20, 22, 25-28	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-28	NO
Industrial applicability (IA)	Claims	1-28	YES
	Claims	None	NO
2. Citations and explanations:			
Claims 1-6, 8, 11-12, 14-20, 22, 25-28 lack novelty under PCT Article 33(2) as being anticipated by Bass et al. Referring to Claim 1, Bass et al. disclose a key duplicating machine comprising a key load position to receive a key (Para. [0048]), an antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), configured to communicate with a key located at said key load position (Para. [0061]), and a cutting member (Fig. 8, Left and right cutting wheels 60, 62), configured to cut a key pattern into a key blank at said key load position (Para. [0066]). Referring to Claim 2, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), is configured to transmit data to said key (Paras. [0061], [0065]). Referring to Claim 3, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), is configured to receive data from said key (Para. [0061] - regarding the logic may make direct comparisons between physical dimensions of known key blanks 24 and the features of the master key 22). Referring to Claim 4, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said key is a master key (Fig. 1, master key 22). Referring to Claim 5, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said key is a key blank (Fig. 4b key blank 24). Referring to Claim 6, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said key includes a microchip embedded therein (Para. [0093]). Referring to Claim 8, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose further comprising an outer shell (Fig. 1, outer shell 12), having an opening positioned about said key load position (Fig. 1, and Para. [0046]). Referring to Claim 11, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said key load position comprises a base (Fig. 2, base 16), and a door clamp (Fig. 2, door clamp 14). Referring to Claim 12, Bass et al. disclose a key duplicating machine as in Claim 8, and further disclose wherein said door clamp (Fig. 2, door clamp 14), is movable with respect to said base (Fig. 2, base 16, and Para. [0046]). Referring to Claim 14, Bass et al. disclose a key duplicating machine as in Claim 1, and further disclose wherein said cutting member (Fig. 8, Left and right cutting wheels 60, 62), is a cutting wheel (Para. [0066]). Referring to Claim 15, Bass et al. disclose a key duplicating machine comprising a key load position to receive a key (Para. [0048]), an antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), configured to communicate with a key located at said key load position (Para. [0061]), and an imaging system (Fig. 6, optical imaging device 50), configured to capture data related to said key at said key load position (Para. [0056]). Referring to Claim 16, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), is configured to transmit data to said key (Paras. [0061], [0065]). Referring to Claim 17, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said antenna (Para. [0061] - regarding the logic may compare the quantified and defined features of the master key 22 with data in a database regarding known key blanks 24), is configured to receive data from said key (Para. [0061] - regarding the logic may make direct comparisons between physical dimensions of known key blanks 24 and the features of the master key 22).			

Form PCT/ISA/237 (Box No. V) (July 2009)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US2011/034564

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Referring to Claim 18, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said key is a master key (Fig. 1, master key 22).

Referring to Claim 19, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said key is a key blank (Fig. 4b key blank 24).

Referring to Claim 20, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said key includes a microchip embedded therein (Para. [0093]).

Referring to Claim 22, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose further comprising an outer shell (Fig. 1, outer shell 12), having an opening positioned about said key load position (Fig. 1, and Para. [0046]).

Referring to Claim 25, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said key load position comprises a base (Fig. 2, base 16), and a door clamp (Fig. 2, door clamp 14).

Referring to Claim 26, Bass et al. disclose a key duplicating machine as in Claim 25, and further disclose wherein said door clamp (Fig. 2, door clamp 14), is movable with respect to said base (Fig. 2, base 16, and Para. [0046]).

Referring to Claim 27, Bass et al. disclose a key duplicating machine as in Claim 25, and further disclose further comprising at least one lever (Fig. 2, handle 18), configured to actuate movement of said door clamp (Para. [0046]).

Referring to Claim 28, Bass et al. disclose a key duplicating machine as in Claim 15, and further disclose wherein said imaging system (Fig. 6, optical imaging device 50), includes a camera (Para. [0056]).

Claims 7, 21 lack an inventive step under PCT Article 33(3) as being obvious over Bass et al. in view of Kubo et al.

Referring to Claim 7, Bass et al. disclose all the limitations of Claim 1, but do not disclose wherein said antenna comprises at least one pair of windings. However, Kubo et al. teach a coil antenna and portable electronic apparatus comprising wherein an antenna (Fig. 2, antenna 100), comprises at least one pair of windings (Fig. 2, windings 2A, 2B). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an antenna comprise at least one pair of windings as taught by Kubo et al. with the invention of Bass et al., for the purpose of customizing the shape of the antenna.

Referring to Claim 21, Bass et al. disclose all the limitations of Claim 15, but do not disclose wherein said antenna comprises at least one pair of windings. However, Kubo et al. teach a coil antenna and portable electronic apparatus comprising wherein an antenna (Fig. 2, antenna 100), comprises at least one pair of windings (Fig. 2, windings 2A, 2B). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an antenna comprise at least one pair of windings as taught by Kubo et al. with the invention of Bass et al., for the purpose of customizing the shape of the antenna.

Claims 9-10, 13, 23-24 lack an inventive step under PCT Article 33(3) as being obvious over Bass et al. in view of Swayze et al.

Referring to Claim 9, Bass et al. disclose all the limitations of Claim 5, but do not disclose wherein said opening is circular. However, Swayze et al. teach an antenna comprising wherein an opening is circular (Fig. 3, and Pg. 1, Col. 2, Lns. 19-27). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an opening circular as taught by Swayze et al. with the invention of Bass et al., for the purpose of allowing the key into a slot.

Referring to Claim 10, Bass et al. disclose all the limitations of Claim 5, but do not disclose wherein said antenna is wound about said opening. However, Swayze et al. teach an antenna comprising wherein an antenna is wound about an opening (Fig. 3, and Pg. 1, Col. 2, Lns. 46-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an antenna wound about said opening as taught by Swayze et al. with the invention of Bass et al., for the purpose of receiving clearer reception.

Referring to Claim 13, Bass et al. in view of Swayze et al. disclose all the limitations of Claim 9, and Bass et al. further disclose further comprising at least one lever (Fig. 2, handle 18), configured to actuate movement of said door clamp (Para. [0046]).

Referring to Claim 23, Bass et al. disclose all the limitations of Claim 22, but do not disclose wherein said opening is circular. However, Swayze et al. teach an antenna comprising wherein an opening is circular (Fig. 3, and Pg. 1, Col. 2, Lns. 19-27). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an opening circular as taught by Swayze et al. with the invention of Bass et al., for the purpose of allowing the key into a slot.

Referring to Claim 24, Bass et al. disclose all the limitations of Claim 22, but do not disclose wherein said antenna is wound about said opening. However, Swayze et al. teach an antenna comprising wherein an antenna is wound about an opening (Fig. 3, and Pg. 1, Col. 2, Lns. 46-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have an antenna wound about said opening as taught by Swayze et al. with the invention of Bass et al., for the purpose of receiving clearer reception.

Claims 1-28 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

Form PCT/ISA/237 (Supplemental Box) (July 2009)

Electronic Acknowledgement Receipt	
EFS ID:	32051253
Application Number:	15920955
International Application Number:	
Confirmation Number:	2833
Title of Invention:	KEY BLANK IDENTIFICATION SYSTEM WITH GROOVE SCANNING
First Named Inventor/Applicant Name:	Chester O.D. Thompson
Correspondence Address:	MCDONALD HOPKINS LLC - 600 Superior Avenue, East Suite 2100 CLEVELAND OH 44114-2653 US 216-348-5400 ipmailbox@mcdonaldhopkins.com
Filer:	Mark Jason Masterson
Filer Authorized By:	
Attorney Docket Number:	16223-00341
Receipt Date:	14-MAR-2018
Filing Date:	
Time Stamp:	14:56:19
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	Non Patent Literature	6157023.pdf	4639741	no	92
			12ce2b630f87cb55d8ac49d478aa6e65edd41352		
Warnings:					
Information:					
2	Non Patent Literature	6157022.pdf	790244	no	9
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4	Other Reference-Patent/App/Search documents	6157065.pdf	47645	no	3
			e951a3e15d7982b1398317888e1813a862ddc132		
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5	Other Reference-Patent/App/Search documents	6157080.pdf	256471	no	6
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Total Files Size (in bytes):			7339615		

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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.