

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ASSA ABLOY AB and HID Global Corporation,
Petitioners,

v.

Jean Hugues Wendling and Daniel William Field,
Patent Owners.

Case No. IPR2023-00046

Patent No. 10,467,830

PETITION FOR *INTER PARTES* REVIEW OF

U.S. PATENT NO. 10,467,830 (CLAIMS 1-20)

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EXHIBIT LIST

EXHIBITS FILED BY PETITIONERS	
EX-1001	U.S. Patent No. 10,467,830 (“’830 Patent”)
EX-1002	Patent Prosecution History of U.S. Patent No. 10,467,830
EX-1003	Declaration of Stuart Lipoff Regarding Invalidity of U.S. Patent No. 10,467,830
EX-1004	<i>Curriculum Vitae</i> of Stuart Lipoff
EX-1005	U.S. Patent No. 10,452,877 to Chis <i>et al.</i> (“Chis”)
EX-1006	U.S. Patent No. 8,943,562 to Guthery <i>et al.</i> (“Guthery”)
EX-1007	TIA-485-A Standard (approved March 3, 1998; reaffirmed December 7, 2012)
EX-1008	U.S. Patent Publication No. 2014/0344960 A1 to Lyle Adams (“Adams”)
EX-1009	U.S. Patent No. 6,285,890 to Jim Panian (“Panian”)
EX-1010	U.S. Patent Publication No. 2009/0102681 A1 to Brennan <i>et al.</i> (“Brennan”)
EX-1011	U.S. Patent No. 8,917,533 to Shine C. Chung (“Chung”)
EX-1012	U.S. Patent Publication No. 2017/0090909 A1 to Guo <i>et al.</i> (“Guo”)

EXHIBITS FILED BY PETITIONERS	
EX-1013	U.S. Patent Provisional Application No. 62/435,506
EX-1014	Open Supervised Device Protocol (OSDP) Version 2.1.5, Security Industry Association, September 2012
EX-1015	World Intellectual Property Organization (WIPO) Int. Pub. No. WO 2018/157247 A1 to Douglas <i>et al.</i> (“Douglas”)

I. INTRODUCTION

Petitioners (ASSA ABLOY AB and HID Global Corporation) request *Inter Partes* Review (“IPR”) of claims 1-20 (the “Challenged Claims”) of U.S. Patent No. 10,467,830 (“’830 Patent,” EX-1001), purportedly owned by Jean Hugues Wendling and Daniel William Field (“Patent Owners”).

II. MANDATORY NOTICES

Real Party-in-Interest: The real parties-in-interest are **ASSA ABLOY AB** (“AAAB”) and **HID Global Corporation** (“HID”). HID is a wholly owned subsidiary of AAAB. None of the other entities were involved in or offered any assistance to the Real-Parties-in-Interest with respect to this IPR.

Related Matters: In an unrelated patent litigation (*HID Global Corporation, et al. v. WaveLynx Technologies Corporation*, No. 1-22-cv-00362 (D. Del.)), WaveLynx alleged that it is the assignee of the ’830 Patent, but did not assert that patent in the suit.¹

Lead Counsel: Dion Bregman (Reg. No. 45,645); Back-up Counsel: Andrew Devkar (Reg. No. 76,671) and James J. Kritsas (Reg. No. 71,714).

¹ There is no such assignment record with the USPTO as of the filing of this Petition.

Service: Service of any documents may be made on Morgan, Lewis & Bockius LLP, 1400 Page Mill Road, Palo Alto, CA, 94304 (Telephone: 650.843.4000; Fax: 650.843.4001).

Petitioners consent to e-mail service at: HID-IPRs@morganlewis.com

III. IDENTIFICATION OF CLAIMS AND GROUNDS

'830 Patent: This patent was filed on **October 11, 2017**, and does not claim priority. It is subject to the AIA.

Chis: U.S. Patent No. 10,452,877 titled “Methods to combine and auto-configure Wiegand and RS485” to Chis, Holloway, and Frame (“Chis,” EX-1005), was filed December 12, 2017, and claims priority to U.S. Provisional Appl. No. 62/435,506 (EX-1013) filed on **December 16, 2016**, and is prior art under §102(a)(2).

Guthery: U.S. Patent No. 8,943,562 titled “Secure Wiegand communications” to Guthery, Robinton, Davis, and Andresky (“Guthery,” EX-1006), was filed November 29, 2012, issued **January 27, 2015**, and is prior art under §102(a)(1).

Adams: U.S. Patent Pub. No. 2014/0344960 A1 titled “Selective control of on-chip debug circuitry of embedded processors” to Adams (“Adams,” EX-1008), was filed May 22, 2013, published **November 20, 2014**, and is prior art under

§102(a)(1).

Panian: U.S. Patent No. 6,285,890 titled “Automatic sensing of communication or accessories for mobile terminals” to Panian (“Panian,” EX-1009), was filed January 26, 1999, issued **September 4, 2001**, and is prior art under §102(a)(1).

Brennan: U.S. Patent Pub. No. 2009/0102681 A1 titled “Fixed network for an automatic utility meter reading system” to Brennan, JR. *et al* (“Brennan,” EX-1010), was filed July 23, 2008, published **April 23, 2009**, and is prior art under §102(a)(1).

Petitioners request that the Board find the Challenged Claims unpatentable on the following grounds:

Ground	Prior Art	Statutory Basis	Claims
1	Chis and Guthery	§103	1, 2, 3-10, 12, 14
2	Chis, Guthery, and Adams	§103	11
3	Chis, Guthery, and Panian	§103	13
4	Chis and Brennan	§103	15
5	Chis, Brennan, and Guthery	§103	16-17
6	Chis, Brennan, and Adams	§103	18-19
7	Chis, Brennan, and Panian	§103	20

IV. CERTIFICATION AND FEES

Petitioners certify that the '830 Patent is available for IPR and that
Petitioners are not barred or estopped from requesting this IPR on the grounds
identified herein.

Any additional fees may be charged to Deposit Account No. 50-0310 (Order
No. 117139-0008).

V. BACKGROUND

A. The '830 Patent

The '830 Patent relates to “access control...[using] an electronic credential
reader.” EX-1001, 1:5-7. The electronic credential reader 100 (blue) receives
credential information from a credential, such as a card 123 (yellow), and transmits
the received credential information to access controller 131 (green) to determine
whether “entry is allowable.” *Id.*, 3:40-56; EX-1003, ¶40.

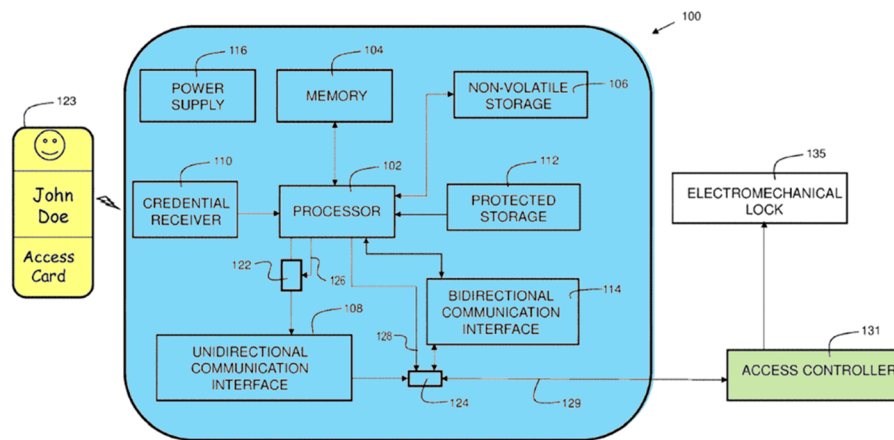


FIG. 1

EX-1001, Fig. 1.²

The reader “can support both the legacy (Wiegand) communications and the OSDP (bidirectional communications).” *Id.*, 4:29-32. By automatically detecting which communication mode to use and switching to the desired mode, the ’830 Patent aims to “greatly streamline[] the conversion process from legacy to secure communications.” *Id.*, 4:32-33; EX-1003, ¶¶41-43.

As shown in Figure 1, reader 100 (blue) includes processor 102 (purple), which controls switch 124 (yellow) to select which communication interface is used, Wiegand/unidirectional (pink) or OSDP/bidirectional (orange). EX-1001, Abstract, 4:59-62, 5:13-15, 7:26-38.

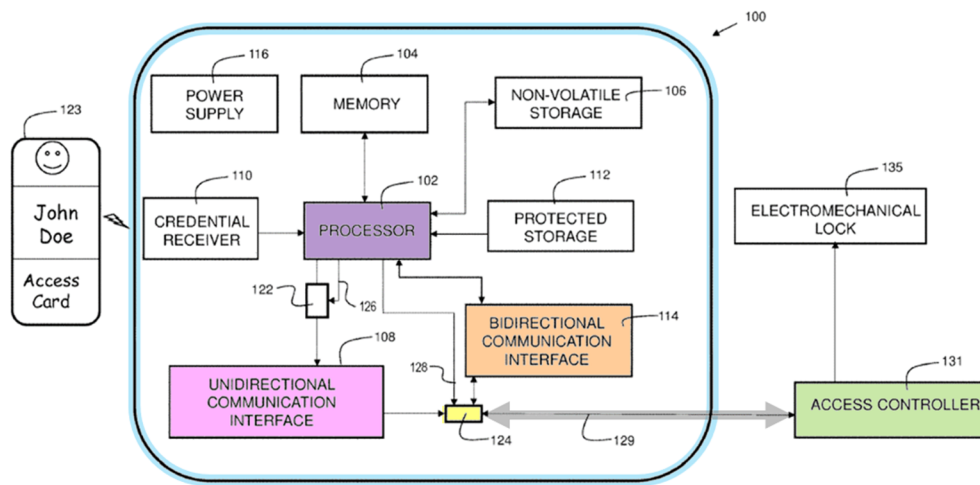


FIG. 1

EX-1001, Fig. 1. Regardless of the interface used, reader 100 (blue) uses the same

² Emphasis/coloring added throughout unless otherwise noted.

“external communication link 129” (gray) to communicate with access controller 131 (green). *Id.*, Abstract, 4:28-32, 6:17-20; EX-1003, ¶¶44-46.

B. File History of the '830 Patent

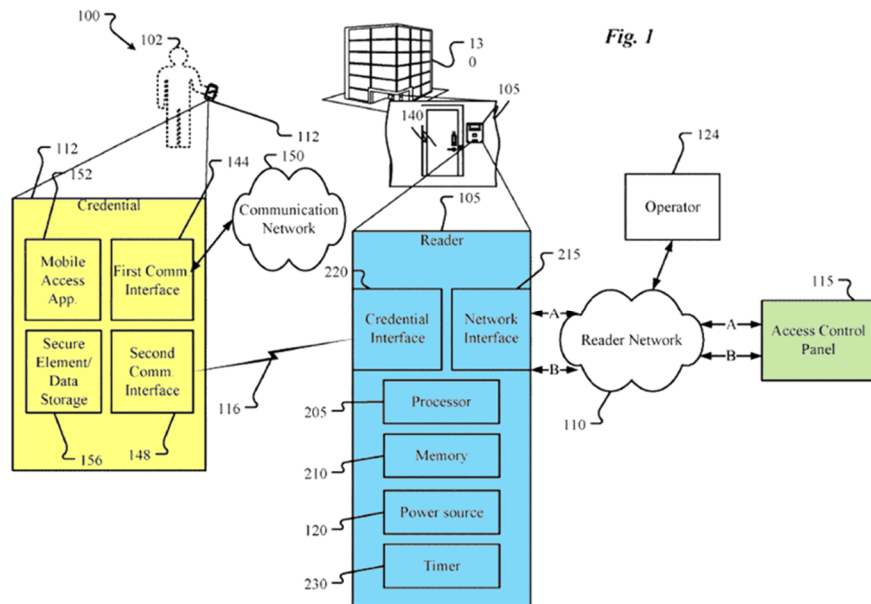
In Applicant’s response to the only Office Action, claims 1, 4, and 16 were amended in accordance with the amendments proposed in an Examiner Interview, and no arguments were presented. EX-1002, 42-49; EX-1003, ¶47.

C. The Prior Art

None of Chis (EX-1005, EX-1013), Guthery (EX-1006), Adams (EX-1008), Panian (EX-1009), and Brennan (EX-1010) were considered during prosecution.

1. Chis

Like the '830 Patent, Chis discloses access control using an “access control reader.” EX-1005, Abstract, 1:14-16; EX-1013, Abstract, ¶1. As shown in Figure 1, the access control reader 105 (blue) receives credential information from a credential 112 (yellow) and transmits the received credential information to access control panel 115 (green) to “mak[e] access control decisions.” EX-1005, 4:51-55, 5:27-31, 8:8-13; EX-1013, ¶¶23, 26, 37.



EX-1005/EX-1013, Fig. 1; EX-1003, ¶¶48-49.

Like the '830 Patent, Chis's reader supports both legacy Wiegand communications and more secured OSDP/RS485 bidirectional communications.

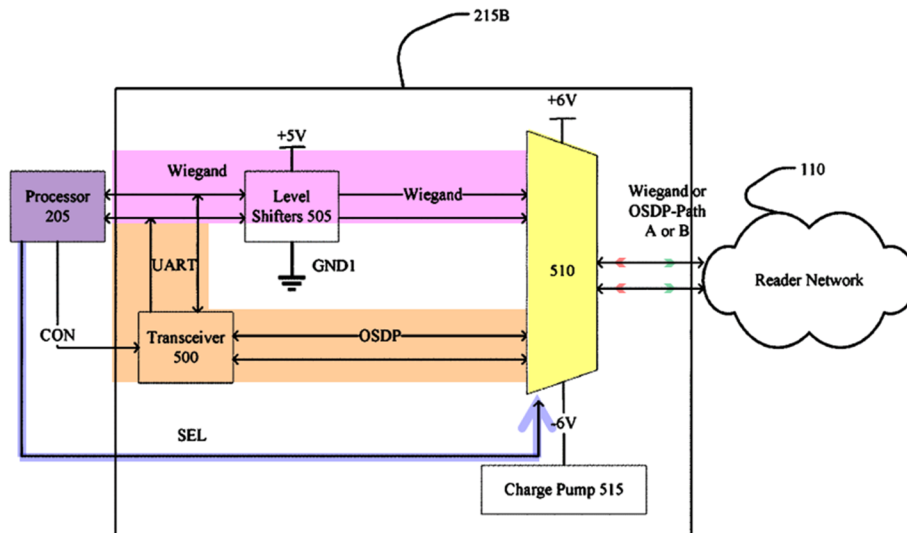
EX-1005, 8:60-9:8; EX-1013, ¶43. Chis's reader also utilizes a switch, *e.g.*,

selector 510 (yellow), to select which communication interface to use,

Wiegand/unidirectional (pink) or OSDP/bidirectional (orange). EX-1005, 11:51-

57; EX-1013, ¶58.

Fig. 5B



EX-1005/EX-1013, Fig. 5B. Regardless of the interface used, Chis's reader uses the same external communication lines, *e.g.*, Wiegand/OSDP paths (two pairs of green and red arrows), to communicate with reader network 110 and therefore no wiring change is needed when switching from one interface to the other. EX-1005, 11:55-57; EX-1013, ¶58; EX-1003, ¶¶50-53.

2. Guthery

Like the '830 Patent and Chis, Guthery enables a credential reader in an access control system to seamlessly switch between Wiegand/unidirectional mode and two-way packet mode. EX-1006, Abstract, 17:9-22, 17:30-32. Guthery discloses that when in Wiegand/unidirectional mode, the reader (blue) transmits data to the host (orange) via the Wiegand data lines (green). EX-1006, 15:32-36,

38-51.

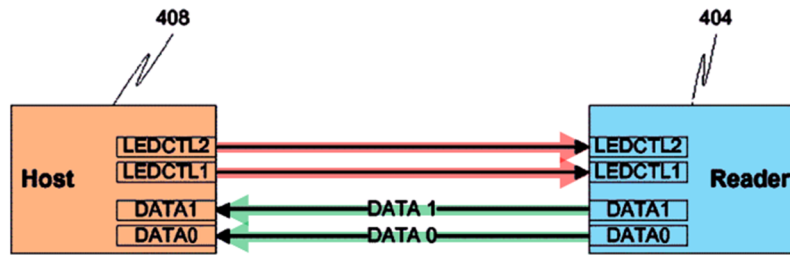


Fig. 5

EX-1006, Fig. 5. Guthery describes Wiegand as further including at least one LEDCTL wire (typically used to configure “the state of the illumination of an LED on the card reader.”). *Id.*, 17:39-41. Guthery discloses using two LEDCTL wires (red) “to carry data communications from the host to the reader.” *Id.*, 15:42-51. “[I]f the state of the LEDCTL is constant for less than 10 ms,” the reader switches from Wiegand/unidirectional mode to bidirectional mode. *Id.*, 17:53-59; EX-1003, ¶¶54-55.

3. Adams

Adams teaches the well-known concept of using a **one-time programmable fuse** to permanently disable an interface (claims 11, 18-19). EX-1008, ¶39; EX-1003, ¶56.

4. Panian

Panian teaches the concept of **using a timer to control the timing of when to revert to a default communication mode** (claims 13 and 20). EX-1009, 7:66-8:2; EX-1003, ¶57.

5. Brennan

Brennan teaches the concept of **transmitting data via a unidirectional interface while also listening for messages on a bidirectional interface** (claim 15). EX-1009, ¶25; EX-1003, ¶58.

VI. LEVEL OF SKILL

A person having ordinary skill in the art (“POSITA”) at the time of the alleged invention would have had at least an undergraduate degree in electrical engineering, or equivalent education, and at least two years of work experience in the field of access control. EX-1003, ¶¶36-38.

VII. ARGUMENT

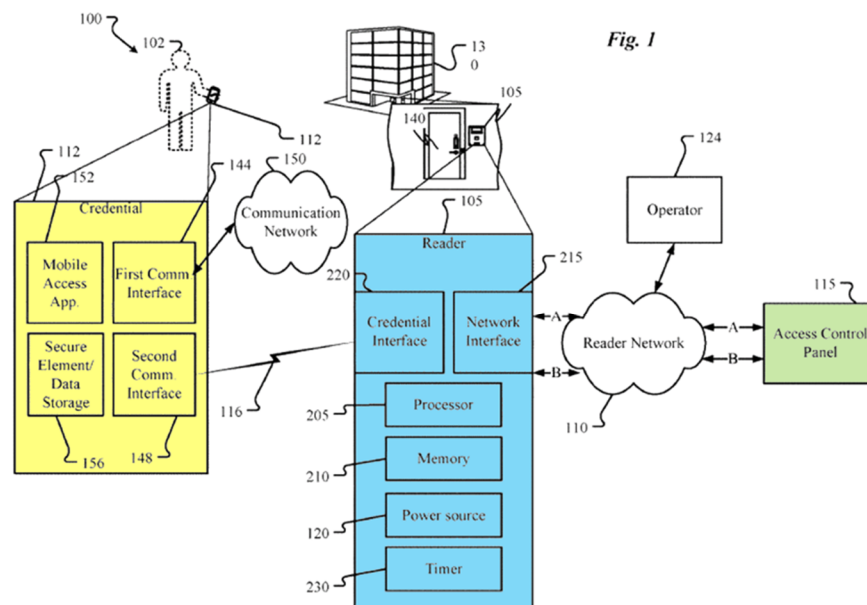
A. GROUND #1: Claims 1-10 and 12 are rendered obvious by Chis in view of Guthery

1. Claim 1³

Preamble 1[P]

Chis discloses “an electronic credential reader.” EX-1003, ¶¶70-73.⁴

Chis discloses in Figure 1 an “access control system” including a credential reader. EX-1005, 1:36-37, 4:37-38; EX-1013, ¶¶4, 23.



EX-1005/EX-1013, Fig. 1. As shown, “credentials 112 [yellow] [are] presented to

³ A full claim listing can be found in the Appendix.

⁴ Citations to the expert declaration often appear at the end of paragraphs but apply to the full paragraph in which they are cited.

the credential interface 220 of the **access control reader 105** [blue],” which “communicate[s] with the access control panel 115 [green] through reader network 110 using one or more communication protocols.” EX-1005, 4:53-55, 8:56-59; EX-1013, ¶¶23, 42. EX-1003, ¶71.

As shown in Figure 2, “the **reader 208** [] illustrates additional details of the **reader 105** in FIG. 1.” EX-1005, 8:40-42; EX-1013, ¶41. “[T]he **reader 208** [blue] includes a power source 120 [gray], a timer 230 [brown], and a memory 210 [red] storing instructions for execution by the processor 205 [purple].” EX-1005, 8:42-45; EX-1013, ¶41.

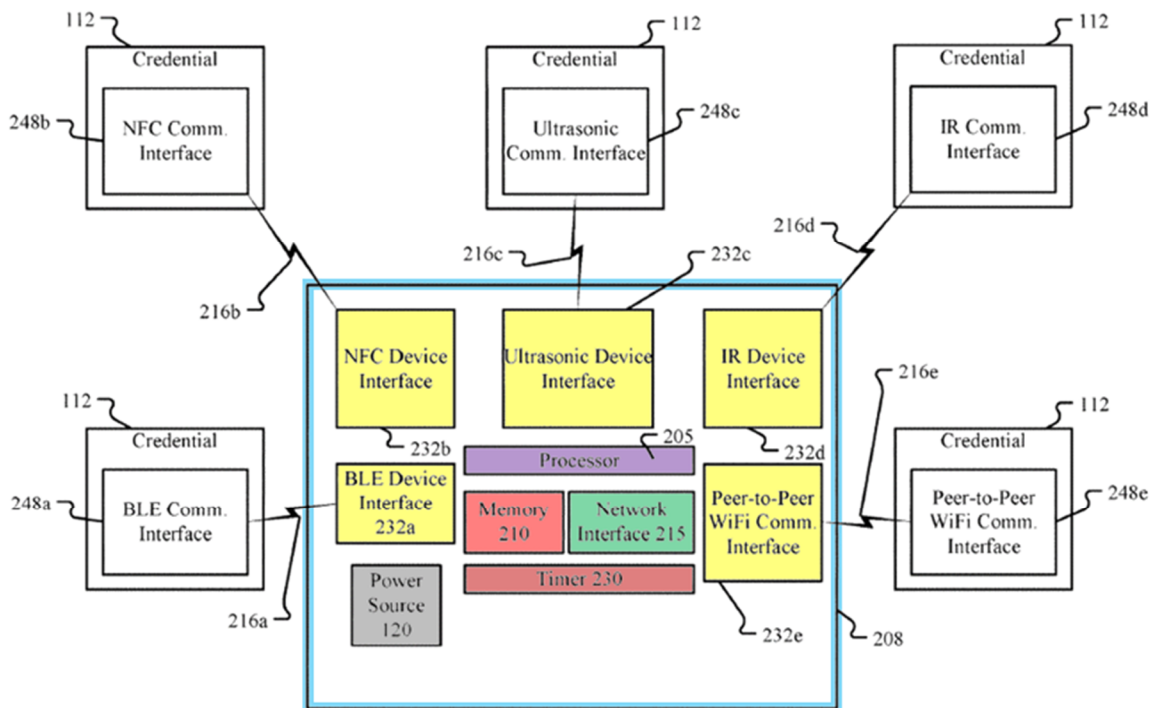


Fig. 2

EX-1005/EX-1013, Fig. 2. **Reader 208** (blue) also includes various “device

interfaces 232 *a-e* [yellow]...for communicating with credentials 112 of different types” and “a network interface 215 [green] for communicating with access control panel 115.” EX-1005, 9:35-38, 9:47-49; EX-1013, ¶46. Therefore, the credential reader disclosed in Chis is an electronic credential reader. EX-1003, ¶72.

Therefore, Chis discloses “**an electronic credential reader** [*e.g.*, access control reader 105 and/or 208].” EX-1003, ¶¶70-73.

Limitation 1[A]

The claim requires “**a credential receiver**,” which is disclosed by Chis. EX-1003, ¶¶74-77.

According to the ’830 Patent, “[c]redential receiver 110 can include...a magnetic stripe reader, an optical reader, a near field communications (NFC) reader, or other suitable technology for reading a credential.” EX-1001, 3:41-44; EX-1003, ¶75.

Like the ’830 Patent, Chis discloses reader 208 (blue) that includes various “device interfaces 232 *a-e* [yellow]...for communicating with credentials 112 of different types.” EX-1005, 9:35-38; Fig. 1 (“Credential Interface 220”), 5:36-44; EX-1013, ¶¶27, 46, Fig. 1.

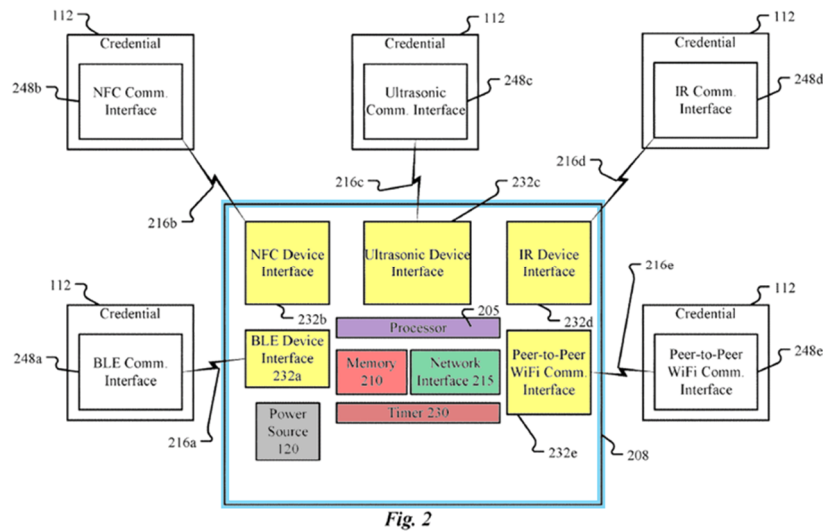


Fig. 2

EX-1005/EX-1013, Fig. 2. “[W]ireless (or contactless) communication may be achieved by antennas built into the reader [] and the credential [].” EX-1005, 8:52-54; EX-1013, ¶42; EX-1003, ¶76.

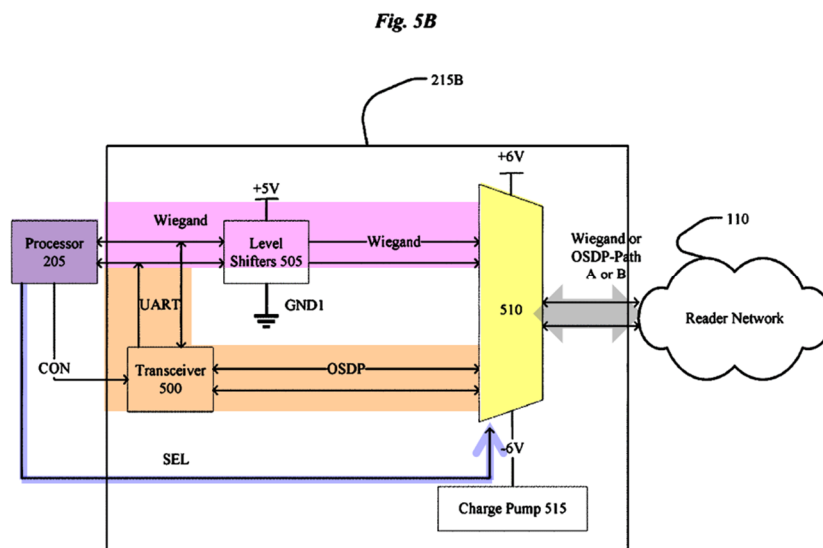
Therefore, Chis discloses “**a credential receiver** [e.g., Chis’s various device interfaces and/or antennas for receiving credentials (e.g., 232a-e)].” EX-1003, ¶¶74-77.

Limitation 1[B]

The claim requires “**a unidirectional communication interface**,” which is disclosed by Chis. EX-1003, ¶¶78-80.

Chis discloses that “**network interface 215** is used to conduct **unidirectional communications** with at least one other network device (e.g., the control panel 115)...[in] a **Wiegand Mode** of operation.” EX-1005, 12:47-51,

9:2-8; EX-1013, ¶¶43, 65. As shown in Figure 5B, which “illustrates another example structure of the network interface [215] of FIGS. 1 and 2” (EX-1005, 11:35-36; EX-1013, ¶56), “the processor 205 [purple] controls an output of the selector 510 [yellow] to be in accordance with...OSDP Mode[] or...Wiegand Mode[].” EX-1005, 11:50-55; EX-1013, ¶58.



EX-1005/EX-1013, Fig. 5B.⁵ If the reader operates in Wiegand mode, selector 510 (yellow) selects the Wiegand path (pink), “which allows for the reader 105 to conduct unidirectional (or one way) communications with the control panel 115.” EX-1005, 11:51-57, 9:1-5; EX-1013, ¶¶43, 58. If the reader operates in OSDP

⁵ “The reader network 110...facilitate[s] communication between the network interface 215 and the access control panel 115.” EX-1005, 4:57-60; EX-1013, ¶24.

mode, selector 510 (yellow) selects the OSDP path (orange), “which allows for the reader 105 to conduct bidirectional (or two way) communications with the control panel 115.” EX-1005, 8:60-9:1; EX-1013, ¶43. Regardless of the path selected, the reader uses the same Wiegand/OSDP paths (gray) to communicate with reader network 110. EX-1005, 11:55-57; EX-1013, ¶58. EX-1003, ¶79.

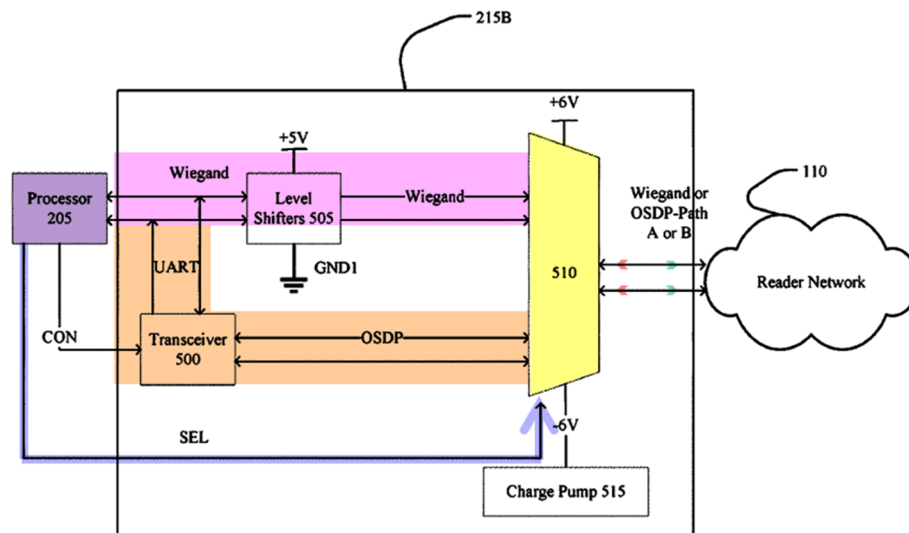
Therefore, Chis discloses “a **unidirectional communication interface** [*e.g.*, Wiegand interface (pink)].” EX-1003, ¶¶78-80.

Limitation 1[C]

The claim requires “a **bidirectional communication interface**,” which is disclosed by Chis. EX-1003, ¶¶81-83.

As explained for Limitation 1[B], Chis’s OSDP mode “allows for the reader 105 to conduct **bidirectional (or two way) communications** with the control panel 115” and “uses twisted-pair balanced line **RS485** wiring standard.” EX-1005, 8:60-9:1, 2:2-3; 3:39-42 (“If an OSDP message is received..., the reader will switch to **OSDP Mode (path=RS485)**”); EX-1013, ¶¶12, 19, 43.

Fig. 5B



EX-1005/EX-1013, Fig. 5B; EX-1003, ¶82.

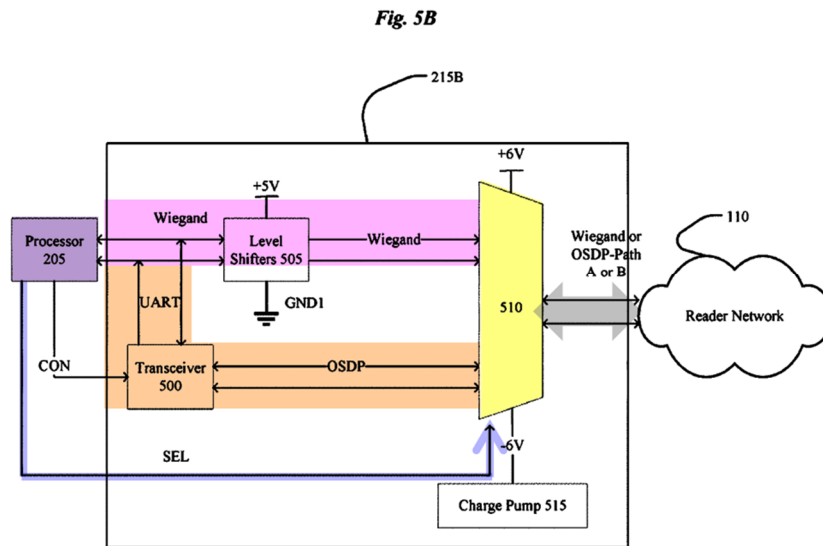
Therefore, Chis discloses “**a bidirectional communication interface [e.g., OSDP/RS485 interface (orange)].**” EX-1003, ¶¶81-83.

Limitation 1[D]

The claim requires “**a plurality of external communication lines, wherein the unidirectional communication interface and the bidirectional interface are coupled to a processor via the external communication lines,**” which is disclosed by Chis. EX-1003, ¶¶84-88.

First, Chis’s reader includes this limitation. As shown in Figure 5B, whether the selector 510 (yellow) selects the Wiegand path/interface (pink) or the

OSDP/RS485 path/interface (orange), the reader uses the same Wiegand/OSDP paths (gray) to communicate with reader network 110. EX-1005, 11:49-57; EX-1013, ¶58.



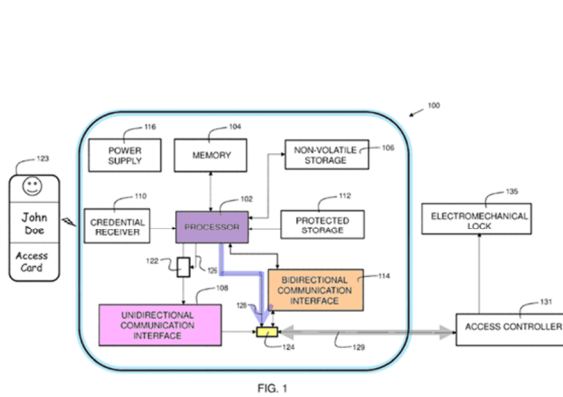
EX-1005/EX-1013, Fig. 5B. Thus, the Wiegand path/interface (pink) and the OSDP/RS485 path/interface (orange) are coupled to the Wiegand/OSDP paths (gray), which are used to communicate with an external device over reader network 110. EX-1003, ¶85.

Second, as shown above, processor 205 (purple) utilizes either the Wiegand path/interface (pink) or the OSDP/RS485 path/interface (orange) to communicate with reader network 110. Thus, the Wiegand path/interface and the OSDP/RS485 path/interface are coupled to processor 205; EX-1003, ¶86.

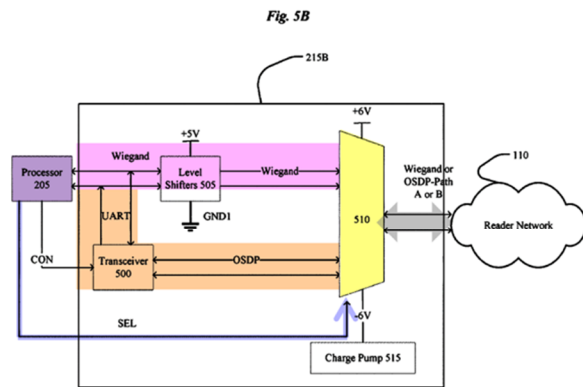
The limitation, “a plurality of external communication lines, wherein the

unidirectional communication interface and the bidirectional interface are **coupled to a processor via the external communication lines,**” is not supported by any embodiment or description in the ’830 Patent specification.⁶ First, the claim requires that the processor is part of the reader, not an external device. Second, for this Petition only, the “**via**” language in this limitation is interpreted to not require the “external communication lines” be located **between** the unidirectional/bidirectional interfaces and the processor, which is consistent with the ’830 Patent’s Figure 1 description. As shown below, the configuration disclosed in Chis and the ’830 Patent’s Figure 1 are the same, *i.e.*, the unidirectional interface (pink) and bidirectional interface (orange) are coupled to a processor (purple) and are connected (*e.g.*, through the yellow switch) to the external communication lines (gray). Thus, Chis discloses the limitation to the same extent as the ’830 Patent specification.

⁶ Petitioners reserve the right to argue invalidity under §112 in other forums.



EX-1001, Fig. 1



EX-1005, Fig. 5B

EX-1001, Fig. 1; EX-1005/EX-1013, Fig. 5B; EX-1003, ¶87.

Therefore, This discloses “**a plurality of external communication lines** [e.g., Wiegand/OSDP paths (gray)], **wherein the unidirectional communication interface** [e.g., Wiegand interface (pink)] **and the bidirectional interface** [e.g., OSDP/RS485 interface (orange)] **are coupled to a processor** [e.g., processor 205 (purple)] **via the external communication lines** [e.g., Wiegand/OSDP paths (gray)].” EX-1003, ¶¶84-88.

Limitation 1[E]

The claim requires “**a computer readable medium coupled to the processor**,” which is disclosed by Chis. EX-1003, ¶¶89-92.

As explained for Limitation 1[D], This includes processor 205 (purple), as shown in Figure 2:

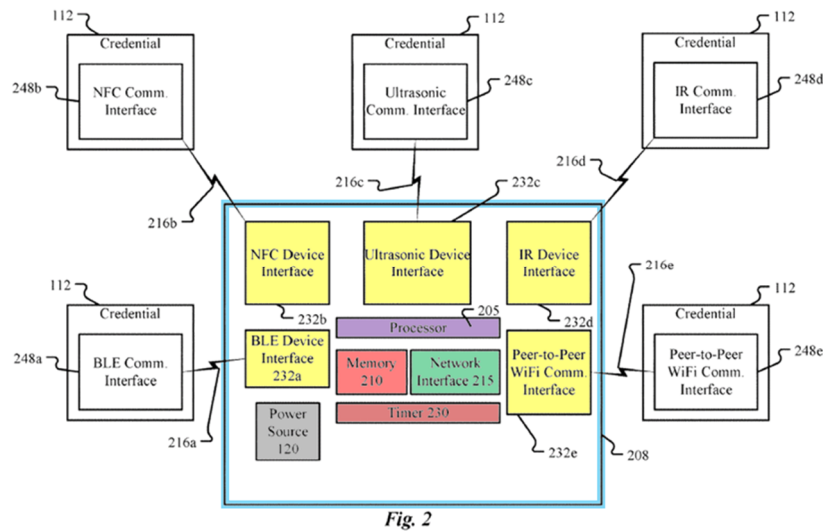


Fig. 2

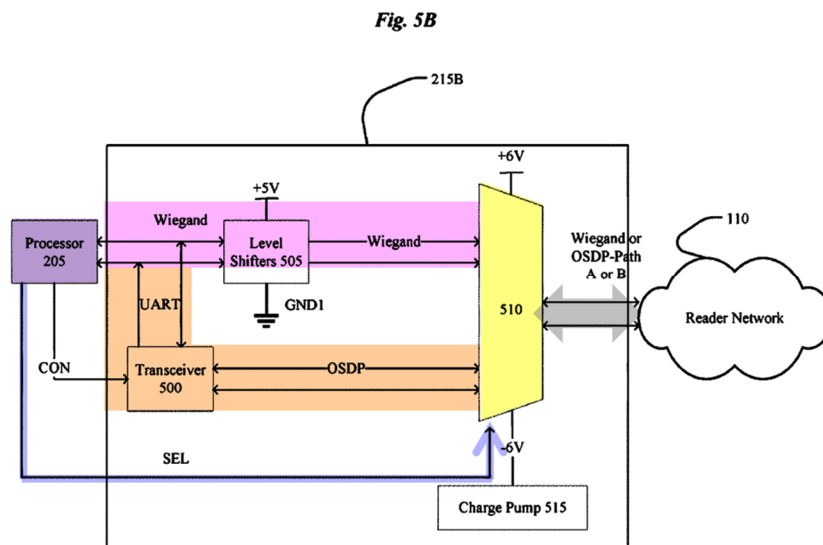
EX-1005/EX-1013, Fig. 2; Fig. 1 (processor 205). Reader 208 (blue) also includes memory 210 (red). “[M]emory 210 may correspond to any type of computer memory such as the memory described with respect to the credential 112,” *i.e.*, “any type of non-transitory **computer-readable medium**.” EX-1005, 8:24-26, 6:18-49; EX-1013, ¶¶29-31, 38. “The **memory 210** may include computer-executable instructions that, when **executed by the processor 205**, enable certain functions of the reader 105 to be performed.” EX-1005, 8:26-29; EX-1013, ¶38. A POSITA would have understood that for the processor 205 to be able to execute instructions stored in memory 210, memory 210 is necessarily coupled to the processor 205. EX-1003, ¶¶90-91.

Therefore, This discloses “**a computer readable medium** [*e.g.*, memory 210 (red)] **coupled to the processor** [*e.g.*, processor 205 (purple)].” EX-1003, ¶¶89-92.

Limitation 1[F]

The claim requires that “**the bidirectional communication interface and the unidirectional communication interface are configured to share the plurality of external communication lines,**” which is disclosed by Chis. EX-1003, ¶¶93-95.

As explained for Limitation 1[D], whether the selector 510 (yellow) selects the Wiegand/unidirectional path/interface (pink) or the OSDP/bidirectional path/interface (orange), the reader uses the same Wiegand/OSDP paths (gray) to communicate with reader network 110. EX-1005, 11:55-57; EX-1013, ¶58.

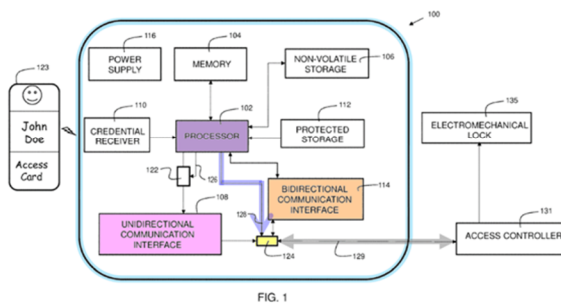


EX-1005/EX-1013, Fig. 5B; EX-1003, ¶94.

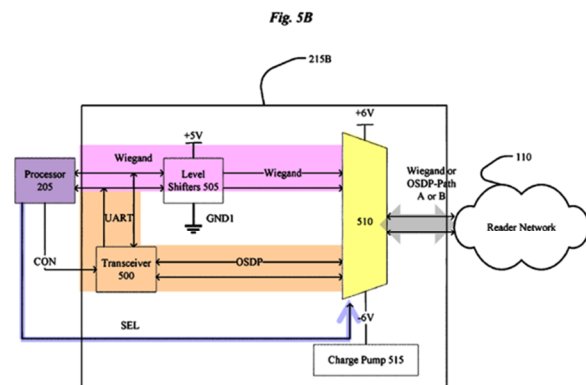
Therefore, Chis discloses that “**the bidirectional communication interface**

[OSDP/RS485 interface (orange)] **and the unidirectional communication interface [Wiegand interface (pink)] are configured to share the plurality of external communication lines [Wiegand/OSDP paths (gray)].** EX-1003, ¶¶93-95.

Accordingly, This discloses all the hardware elements required by claim 1, including a unidirectional interface (pink), a bidirectional interface (orange), a processor (purple), and a plurality of external communication lines (gray):



EX-1001, Fig. 1



EX-1005, Fig. 5B

EX-1001, Fig. 1; EX-1005/EX-1013, Fig. 5B; EX-1003, ¶96.

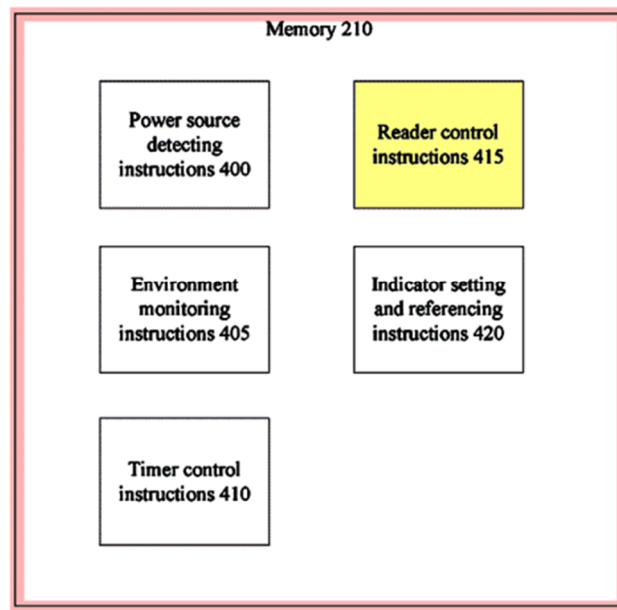
Limitation 1[G]

The claim requires “**the computer readable medium comprises instructions that, when executed by the processor, change from a first communication mode in which the electronic credential reader uses the unidirectional communication interface to communicate with the processor via**

the external communication lines to a **second communication mode** in which the electronic credential reader **uses the bidirectional communication interface** to communicate with the processor via the external communication lines,” which is disclosed by Chis in view of Guthery. EX-1003, ¶¶97-104.

As explained for Limitation 1[E], Chis’s reader includes a computer-readable medium (memory) comprising instructions that can be executed by the reader’s processor. As shown below, “memory 210 [red] may include reader control instructions 415 [yellow] that cause the processor 205 to control the reader 105 to operate in either a first mode or a second mode.” EX-1005, 10:58-60; EX-1013, ¶52.

Fig. 4



EX-1005/EX-1013, Fig. 4. The “first mode correspond[s] to an OSDP Mode of

operation” (bidirectional) and the “second mode correspond[s] to a Wiegand Mode of operation” (unidirectional). EX-1005, 8:64-66, 9:5-6; EX-1013, ¶43; EX-1003, ¶98.

Upon a reset condition (*e.g.*, a power cycle or a reset message), Chis’s reader enters “a Default Mode, which sets the path for RS485 (or OSDP mode).” EX-1005, 2:55-56; EX-1013, ¶16. “If the reader receives an OSDP (or other) message over RS485 [before being presented with any credential], then...the connection path remains...in the Default Mode, but the reader is now officially in an OSDP Mode of operation. However, if...a credential is presented to the reader before an RS485 message is received, then...the reader switches to a Wiegand Mode of operation.” EX-1005, 2:56-3:3; EX-1013, ¶16. Therefore, the reader switches from Default mode (whose path is configured to the OSDP/RS485 bidirectional interface) to Wiegand/unidirectional mode (using the Wiegand unidirectional interface), or switches from Default mode to OSDP/bidirectional mode. EX-1003, ¶99.

A POSITA would have known there are only two options in a dual-interface system like Chis’s Figure 5B: (i) starting in bidirectional and switching to unidirectional, or (ii) starting in unidirectional and switching to bidirectional. An installation environment with a fewer number of early adopters may start with a unidirectional interface whereas a more mature installation environment may start

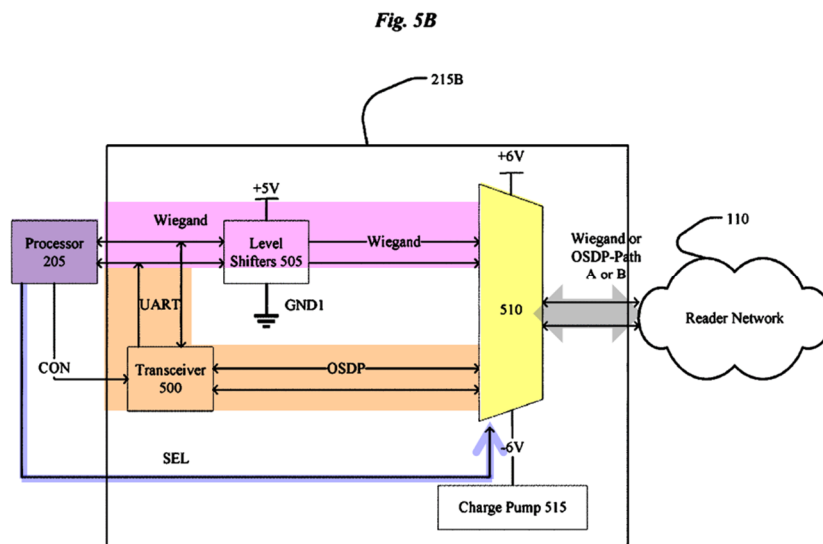
with a bidirectional interface. Although Chis discloses switching from a default bidirectional interface/mode to a Wiegand/unidirectional interface/mode, a POSITA easily could have started in a Wiegand/unidirectional interface/mode and switched to a bidirectional interface/mode because doing so was nothing more than a simple design choice between two suitable alternatives. Indeed, this is precisely the alternative disclosed by Guthery, an earlier patent developed by the same company as Chis (Petitioners). EX-1003, ¶100.

Like Chis (and the '830 Patent), Guthery's reader engages in either unidirectional communication or bidirectional communication with an access control panel. EX-1006, Abstract, 15:19-25. Guthery's reader switches from Wiegand/unidirectional mode to two-way packet/bidirectional mode by utilizing an LEDCTL wire (an LED Control wire; one of the existing five Wiegand wires), *e.g.*, when "the state of the LEDCTL is constant for less than 10 ms." *Id.*, 17:53-59, 12:5-11, 12:38-41, 2:22-26; EX-1003, ¶101.

As explained in the motivation-to-combine section below, a POSITA would have been motivated to modify Chis in view of Guthery so that Chis's reader switches from Wiegand/unidirectional mode to OSDP/bidirectional mode in response to receiving a signal from an upstream device on the existing LEDCTL Wiegand wire. Also, a POSITA would have understood that whether the reader starts in unidirectional mode or in bidirectional mode is a simple design choice and

that such mode switching would easily be implemented by selector 510 in Chis's reader. See motivation-to-combine following claim 1; EX-1003, ¶102.

As shown in Chis's Figure 5B, processor 205 (purple) communicates with reader network 110 via the Wiegand/OSDP paths (gray) regardless of which communication interface—Wiegand path (pink) or OSDP path (orange)—is used. EX-1005, 11:55-57; EX-1013, ¶58.



EX-1005/EX-1013, Fig. 5B; EX-1003, ¶103.

Therefore, Chis as modified by Guthery discloses that **“the computer readable medium [e.g., Chis’s memory 210] comprises instructions that, when executed by the processor [e.g., Chis’s processor 205], change [e.g., as taught by Guthery] from a first communication mode [e.g., Chis’s Wiegand mode] in which the electronic credential reader uses the unidirectional communication**

interface [e.g., Chis's Wiegand interface] to communicate with the processor via the external communication lines [e.g., Chis's Wiegand/OSDP paths] to a second communication mode [e.g., Chis's OSDP mode] in which the electronic credential reader uses the bidirectional communication interface [e.g., Chis's OSDP/RS485 interface] to communicate with the processor via the external communication lines [e.g., Chis's Wiegand/OSDP paths]." EX-1003, ¶¶97-104.

Motivation to Combine Chis and Guthery

A POSITA would have found it obvious to combine Chis and Guthery. EX-1003, ¶¶105-115.

The '830 Patent, Chis, and Guthery are **analogous art** in the **same field of endeavor**, *i.e.*, access control system having a credential reader. Both references (and the '830 Patent) are directed to seamlessly improving the security of an access control system by enabling a legacy Wiegand reader, which communicates with an upstream device via a *unidirectional* Wiegand interface, to also support a higher-security *bidirectional* protocol. EX-1001, 3:16-19; EX-1005, 2:7-11, 3:20-30; EX-1013, ¶¶12, 18; EX-1006, 1:16-18, 11:5-21. Both Chis and Guthery were developed and owned by the same company, and both are directed to improving physical access control systems. In both references (and the '830 Patent), a reader can switch between unidirectional and bidirectional modes. EX-1001, Abstract;

EX-1005, 4:1-13; EX-1013, ¶20; EX-1006, 17:53-59. Moreover, both references (and the '830 Patent) are in class G06F. Both references (and the '830 Patent) allow seamless upgrades of Wiegand systems by reusing existing legacy Wiegand wiring for bidirectional communication and therefore no wiring changes are needed. EX-1001, 3:16-21; EX-1005, 11:55-57; EX-1013, ¶58; EX-1006, 9:64-67; EX-1003, ¶106.

As shown in Figure 2, the '830 Patent discloses a reader having a switch 124 (yellow), which allows the reader to communicate with an upstream device using either the unidirectional communication interface (pink) or the bidirectional communication interface (orange). EX-1001, 6:17-20.

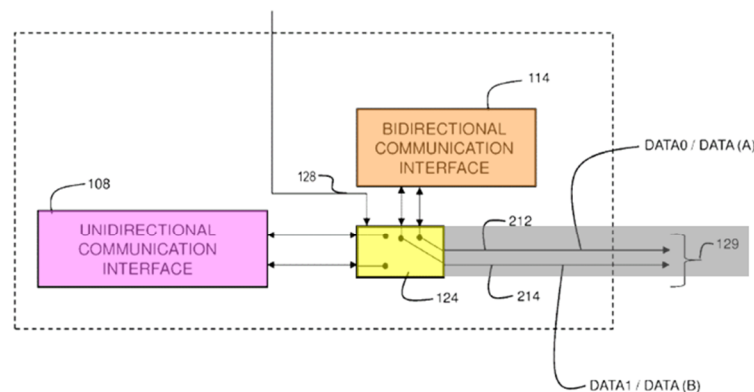


FIG. 2

EX-1001, Fig. 2. According to the '830 Patent, the reader may operate in one of three modes: Wiegand mode, OSDP mode, and hunt mode. *Id.*, 6:2, 4:43, 4:63.

Regardless of the mode, existing Wiegand data transmission lines (gray) are used

Like the '830 Patent, Chis discloses in Figure 5B a reader having a switch, *e.g.*, selector 510 (yellow), which allows the reader to communicate with an upstream device using either the unidirectional communication interface (pink) or the bidirectional communication interface (orange). EX-1005, 11:51-57; EX-1013, ¶58.

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¶16. Chis also discloses switching from default bidirectional mode to Wiegand/unidirectional mode. *Id.* A POSITA would have known that switching from Wiegand/unidirectional mode to a bidirectional mode was a suitable alternative and a simple matter of design choice. Indeed, this is precisely the alternative disclosed by Guthery, developed by the same company, which describes an earlier iteration of the technology. EX-1003, ¶108.

Guthery teaches changing from Wiegand/unidirectional mode to bidirectional mode, *e.g.*, by utilizing an existing Wiegand wire—LEDCTL. EX-1006, 12:5-11, 12:38-41, 2:22-26 (“LEDCTL...is often used by the upstream device to control a light-emitting diode (LED) in the reader”). If the reader determines that “the state of the LEDCTL is constant for less than 10 ms,” it switches from Wiegand/unidirectional mode to bidirectional mode. *Id.*, 17:53-59. EX-1003, ¶109.

A POSITA would have been **motivated** to incorporate Guthery’s Wiegand-to-OSDP mode switching functionality into Chis’s reader for **multiple reasons**. First, there are only two types of communication interfaces disclosed in Chis: Wiegand/unidirectional interface and OSDP/RS485 (bidirectional) interface. Therefore, choosing to default to the Wiegand mode (unidirectional interface) and switching, when appropriate, to the OSDP mode (OSDP/RS485 bidirectional interface) would have been a **simple design alternative**, or **obvious to try**, for a

POSITA implementing Chis's reader. Second, a POSITA would have understood that **if unidirectional access controllers were more common, defaulting to Wiegand mode (unidirectional) would be advantageous because it would reduce processing workload and power usage.** Likewise, if bidirectional access controllers were more common, defaulting to OSDP mode (bidirectional) would be advantageous for the same reason. Both defaulting to the Wiegand mode and switching to the bidirectional mode and defaulting to the bidirectional mode and switching to the Wiegand mode are methods well known in the art, such as in Chis and Guthery. Therefore, a POSITA would have been motivated to modify Chis's reader to default to the Wiegand mode to yield predictable results, especially if the Wiegand access controllers were prevalent in the market. Third, modifying Chis's reader in view of Guthery merely involves a **simple substitution of one known element**, *e.g.*, defaulting to the Wiegand mode and switching to the bidirectional mode, **for another**, *e.g.*, defaulting to the bidirectional mode and switching to the Wiegand mode. EX-1003, ¶110.

A POSITA would have had a **reasonable expectation of success** in incorporating Guthery's Wiegand-to-OSDP mode switching functionality into Chis's reader. In both Chis and Guthery, the reader is capable of communicating via both unidirectional interface and bidirectional interface. EX-1005, 3:4-7; EX-1013, ¶17; EX-1006, 17:7-12. Likewise, in both Chis and Guthery, the reader uses

existing Wiegand data communication wires to communicate with an upstream device regardless of the reader's mode. EX-1005, 11:55-57; EX-1013, ¶58; EX-1006, 15:43-55. As explained below, Chis's reader includes all the hardware elements required for the Chis-Guthery combination, and the only modification from Guthery is the software change (with no or minor hardware changes) that allows the reader to switch from Wiegand (unidirectional) mode to OSDP (bidirectional) mode upon receiving a signal from LEDCTL wire, which is part of the legacy Wiegand wiring in Chis's reader. EX-1003, ¶111.

Guthery discloses that "the Wiegand protocol uses five wires." EX-1006, 1:63-64. As illustrated in Figure 5, two data transmission wires (green) "are referred to as DATA0 and DATA1." *Id.*, 2:13.

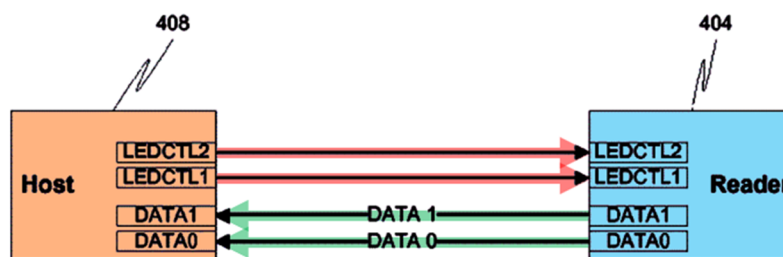
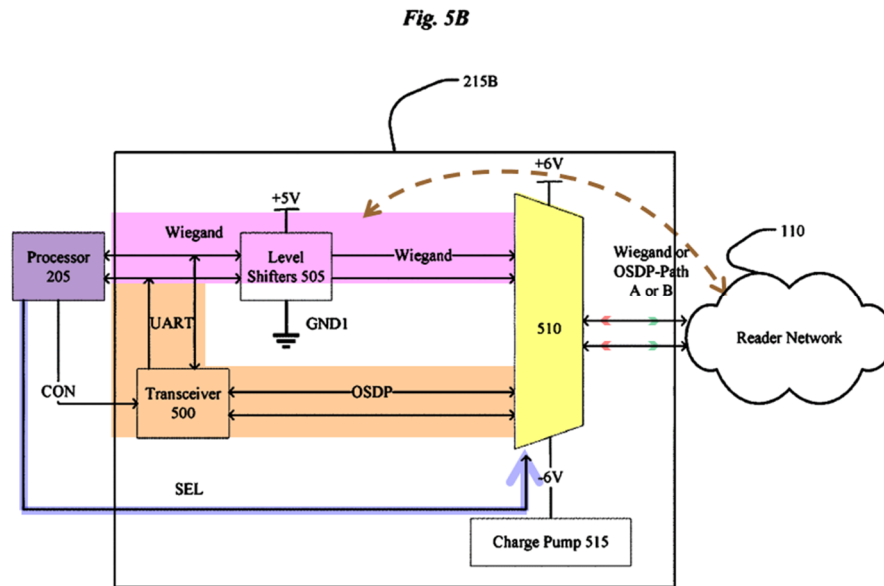


Fig. 5

EX-1006, Fig. 5. The Wiegand protocol also includes an LEDCTL line,⁷ which carries control signals that the reader interprets to configure “the state of the illumination of an LED on the card reader.” *Id.*, 17:39-41, 11:67-12:5. Guthery utilizes this LEDCTL line for “Upstream Device-Initiated Mode Change”—in response to a signal “on the LEDCTL line of less than 10 ms by the upstream device,” Guthery’s reader switches from Wiegand (unidirectional) mode to bidirectional mode. *Id.*, 17:23, 17:64-65, 17:52-59. “Data may be sent to the reader in a secure fashion...within the 10 ms window.” *Id.*, 17:59-61. EX-1003, ¶112.

Similarly, although Chis’s Figure 5B illustrates only two data transmission wires (pink) for the Wiegand interface, a POSITA familiar with the Wiegand protocol and Guthery would have understood that the reader also includes at least one LEDCTL wire (brown dash line) as part of the standard Wiegand wiring for controlling a Light Emitting Diode (LED) used by Guthery for another purpose. *See* EX-1001, 4:29-30 (“legacy (Wiegand) communications”); 3:7-8; EX-1003, ¶113.

⁷ Although the embodiment in Figure 5 includes two LEDCTL lines, two lines are not necessary for the Chis-Guthery combination.



EX-1005/EX-1013, Fig. 5B.⁸

Therefore, like Guthery's reader, which switches from Wiegand mode to bidirectional mode in response to a signal on the LEDCTL line, Chis's reader could similarly be modified to perform such Wiegand-to-OSDP switching in response to a signal on the existing LEDCTL line (brown dash line), without any hardware change. Thus, a POSITA would have found it obvious to incorporate Guthery's Wiegand-to-bidirectional mode switching in Chis's reader, which would

⁸ The placement of the LEDCTL (brown dash) is for illustrative purposes. A POSITA would have understood that the LEDCTL line is part of the legacy wiring even though it is not a focus of the Chis specification. EX-1003, ¶113.

result in a working system.⁹ EX-1003, ¶114.

2. Claim 2

As explained for Limitation 1[C], Chis in view of Guthery discloses “[t]he **electronic credential reader of claim 1, wherein the bidirectional communication interface comprises an RS-485 interface** [e.g., Chis’s OSDP/RS485 interface (orange)].” EX-1003, ¶116.

3. Claim 3

Limitations 3[P-D] and 3[G-H]

Limitations 3[P-D] and 3[G-H] are substantially identical to Limitations 1[P-D] and 1[E-F], respectively, and are disclosed for the same reasons. EX-1003, ¶¶118-119 (including comparison chart).

Limitation 3[E]

For the reasons explained for Limitation 1[D] and illustrated in Chis’s

⁹ Since the LEDCTL line in Guthery is part of the bidirectional interface, a POSITA would have understood that the LEDCTL line in the Chis-Guthery reader is also part of its OSDP/bidirectional interface. EX-1003, ¶115.

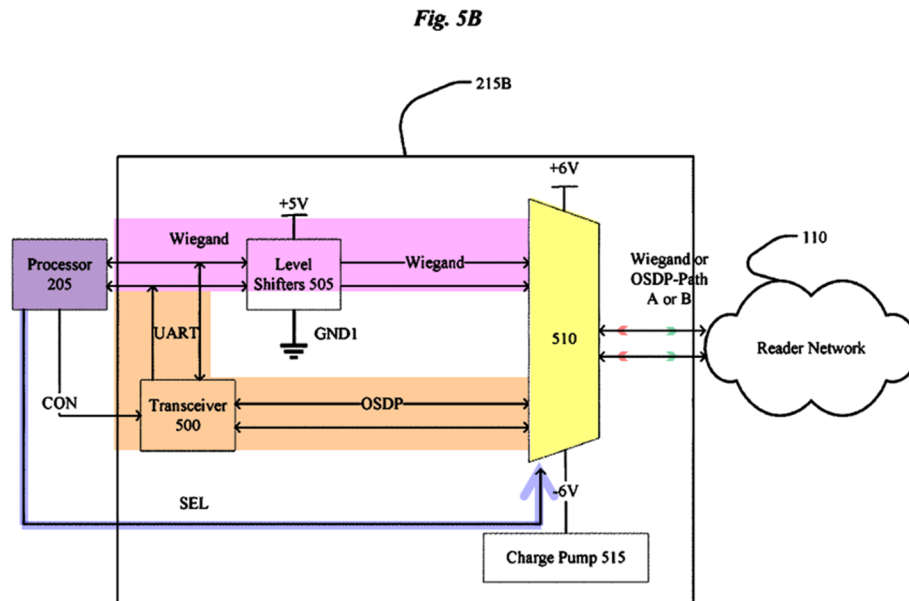
Figure 5B, Chis discloses “**a switch [e.g., selector 510] configured to selectively couple the unidirectional communication interface [e.g., Wiegand interface (pink)] and the bidirectional communication interface [e.g., OSDP/RS485 interface (orange)] to the plurality of external communication lines [e.g., Wiegand/OSDP paths (gray)].**” EX-1003, ¶120.

Limitation 3[F]

The claim requires “**a processor coupled via the plurality of external communication lines to the switch, for the processor to communicate with the unidirectional communication interface and bidirectional communication interface through both the plurality of external communication lines and the switch,**” which is disclosed by Chis.¹⁰ EX-1003, ¶¶121-124.

As shown in Chis Figure 5B, “the processor 205 [purple] controls an output of the selector 510 [yellow] according to a selection signal SEL [blue].” EX-1005, 11:50-51; EX-1013, ¶58.

¹⁰ For this Petition only, the “via” language is interpreted as discussed for Limitation 1[D]. EX-1003, ¶122.



EX-1005/EX-1013, Fig. 5B. When selector 510 (yellow) selects the Wiegand path/interface (pink), processor 205 (purple) sends data over the Wiegand path/interface (pink), selector 510 (yellow), and the Wiegand/OSDP lines (green arrows) to reader network 110. EX-1005, 11:51-55; EX-1013, ¶58. When selector 510 (yellow) selects the OSDP path/interface (orange), processor 205 (purple) sends/receives data via the OSDP path/interface (orange), selector 510 (yellow), and the Wiegand/OSDP lines (green and red arrows). *Id.*; EX-1003, ¶123.

Therefore, This discloses “**a processor [e.g., processor 205] coupled via the plurality of external communication lines [e.g., Wiegand/OSDP paths (green and red arrows)] to the switch [e.g., selector 510], for the processor to communicate with the unidirectional communication interface [e.g., Wiegand**

interface (pink)] **and bidirectional communication interface** [e.g., OSDP/RS485 interface (orange)] **through both the plurality of external communication lines** [e.g., Wiegand/OSDP paths (green and red arrows)] **and the switch** [e.g., selector 510].” EX-1003, ¶¶121-124.

Limitation 3[I]

The claim requires that “the **computer readable medium comprises instructions** that, when executed by the processor, **control the switch to change from a first communication mode** in which the electronic credential reader **uses the unidirectional communication interface** to communicate with the processor via the external communication lines **to a second communication mode** in which the credential reader **uses the bidirectional communication interface** to communicate with the processor via the external communication lines,” which is disclosed by Chis in view of Guthery. EX-1003, ¶¶125-127.

As explained for Limitation 1[G], Chis in view of Guthery discloses that “**the computer readable medium** [e.g., Chis’s memory 210] **comprises instructions that, when executed by the processor** [e.g., Chis’s processor 205],... **change** [e.g., as taught by Guthery] **from a first communication mode** [e.g., Chis’s Wiegand mode] **in which the electronic credential reader uses the unidirectional communication interface** [e.g., Chis’s Wiegand interface] **to**

communicate with the processor via the external communication lines [e.g., Chis's Wiegand/OSDP paths] to a second communication mode [e.g., Chis's OSDP mode] in which the credential reader uses the bidirectional communication interface [e.g., Chis's OSDP/RS485 interface] to communicate with the processor via the external communication lines [e.g., Chis's Wiegand/OSDP paths].” EX-1003, ¶126.

As explained for Limitations 1[G] and 3[E], the change from Wiegand mode to OSDP mode may be caused by a switch, e.g., Chis's selector 510, which is controlled by Chis's processor 205 via the “selection signal SEL.” EX-1005, 11:50-51; EX-1013, ¶58; EX-1003, ¶127.

In summary, Chis discloses all the hardware elements required by claim 3, including a unidirectional communication interface (pink), a bidirectional communication interface (orange), a processor (purple), a switch (yellow) and a plurality of external communication lines (gray):

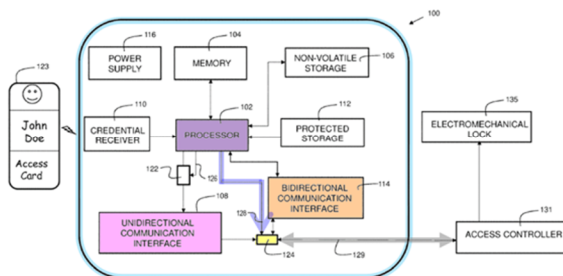


FIG. 1
EX-1001, Fig. 1

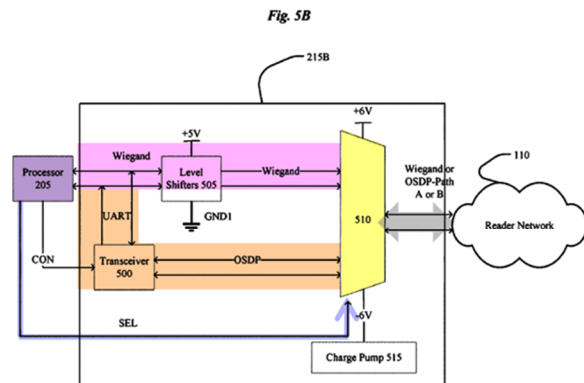


Fig. 5B
EX-1005, Fig. 5B

EX-1001, Fig. 1; EX-1005/EX-1013, Fig. 5B. Although Chis discloses switching from default/bidirectional mode to Wiegand/unidirectional mode, Guthery discloses switching from Wiegand/unidirectional mode to bidirectional mode. *See* motivation-to-combine Chis and Guthery. EX-1003, ¶128.

4. Claim 4

Chis in view of Guthery discloses “[t]he **electronic credential reader of claim 3, wherein the unidirectional communication interface comprises an output interface.**” EX-1003, ¶¶129-130.

Chis discloses that the reader may communicate to, *i.e.*, output data to, the reader network via Wiegand interface. EX-1005, 9:1-8, 11:51-57, 12:47-51, Fig. 5B; EX-1013, ¶¶43, 58, 65, Fig. 5B. Therefore, Chis discloses that “**the unidirectional communication interface [Chis’s Wiegand interface] comprises an output interface.**” EX-1003, ¶130.

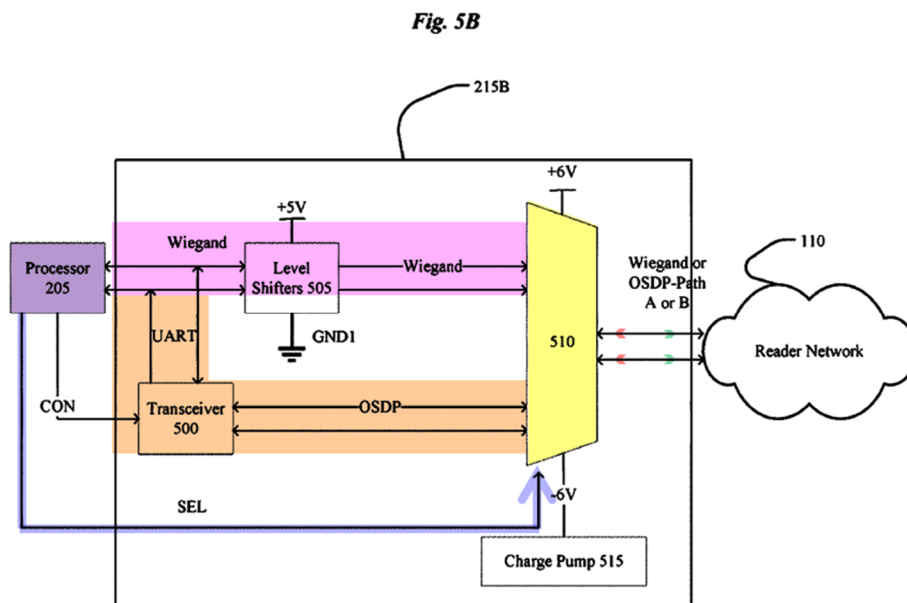
5. Claim 5

The additional limitation in claim 5 is identical to that in claim 2. For the reasons explained for claim 2, Chis/Guthery discloses claim 5. EX-1003, ¶131.

6. Claim 6

This in view of Guthery discloses “[t]he electronic credential reader of claim 3, wherein the plurality of external communication lines comprises two communication lines.” EX-1003, ¶¶132-134.

As shown in Figure 5B, the OSDP/Wiegand lines (two pairs of green and red arrows) are two communication lines.



EX-1005/EX-1013, Fig. 5B. As explained in the motivation-to-combine Chis and Guthery, a POSITA would have understood that when in Wiegand mode, the Wiegand/OSDP paths (green and red arrows in Chis Fig. 5B) include the two Wiegand data transmission wires (green arrows below in Guthery Fig. 5), *i.e.*, DATA0 and DATA1 lines. EX-1003, ¶133.

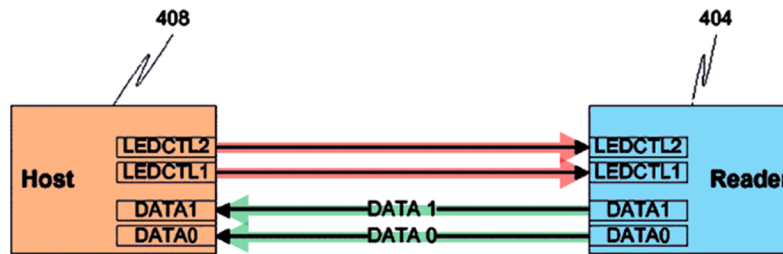


Fig. 5

EX-1006, Fig. 5.

7. Claim 7

As explained for claim 6, Chis in view of Guthery discloses “[t]he electronic credential reader of claim 6, wherein the two communication lines comprises a DATA0 line and a DATA1 line [e.g., Chis’s two green arrows].”

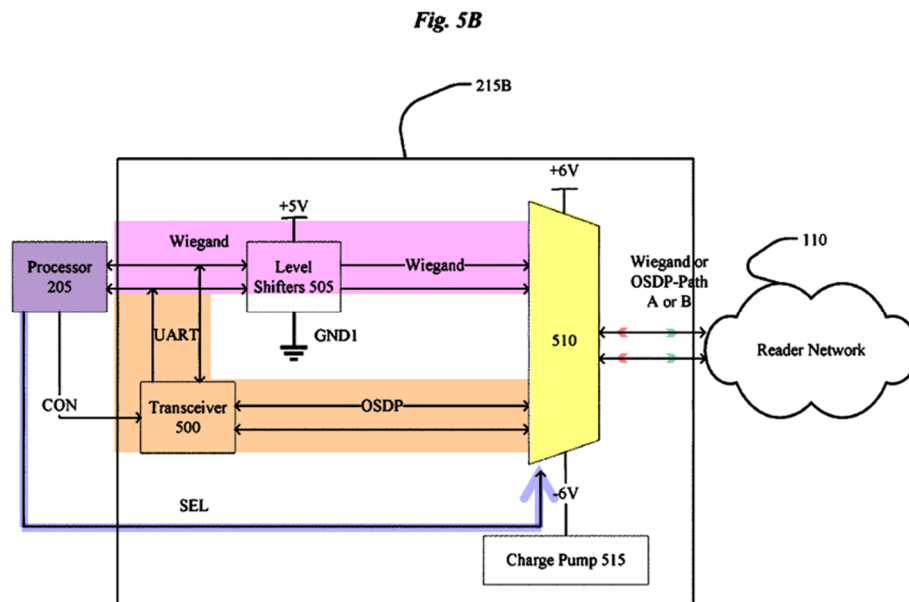
EX-1003, ¶135.

8. Claim 8

Chis in view of Guthery discloses “[t]he electronic credential reader of claim 7, wherein the two communication lines further comprise a RS-485 DATA (A) line and a RS-485 DATA (B) line.” EX-1003, ¶¶136-138.

Chis discloses that “OSDP uses twisted-pair balanced line RS485 wiring standard [TIA/EIA-485].” EX-1005, 2:2-3; EX-1013, ¶12. Therefore, as shown

in Figure 5B, a POSITA would have understood that, when in OSDP mode, the two Wiegand/OSDP lines (two pairs of green and red arrows) correspond to the two data transmission lines in the RS485 interface, *e.g.*, the twisted pair of DATA(A) line and DATA(B) line. EX-1003, ¶137.



EX-1005/EX-1013, Fig. 5B.

The '830 Patent acknowledges that RS485 was developed before the '830 Patent and “has a variety of wiring modes, including a 2-wire mode. In a 2-wire RS-485 mode, there is a DATA (A) signal and a DATA (B) signal.” EX-1001, 5:65-67, 2:59-3:2; TIA-485-A Standard, EX-1007, p.1 (“APPROVED: MARCH 3, 1998...REAFFIRMED: DECEMBER 7, 2012”), p.13 (“Balanced interconnecting cable”); Fig. 1 (DATA(A) line in red, DATA(B) line in green).

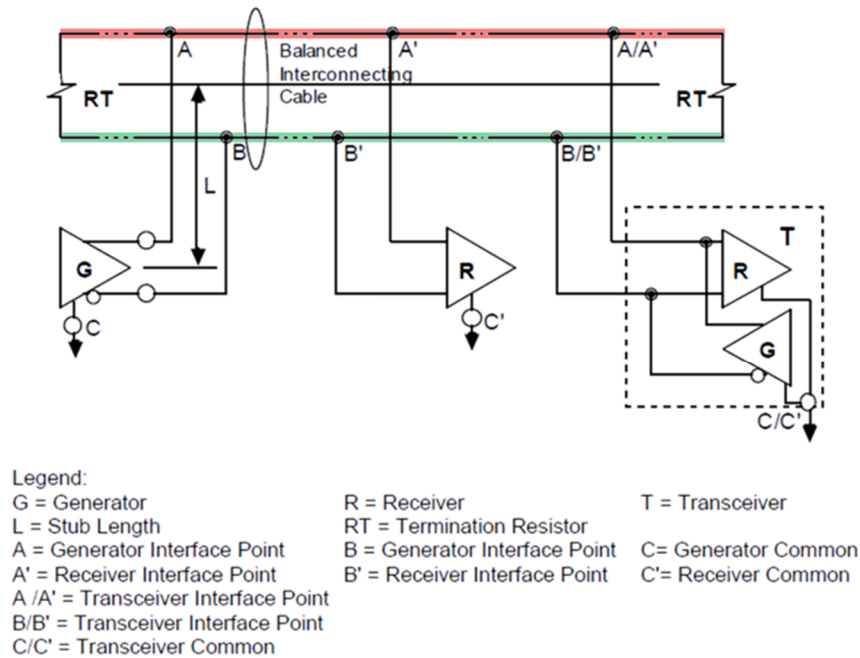


Figure 1 - Multipoint interconnect application

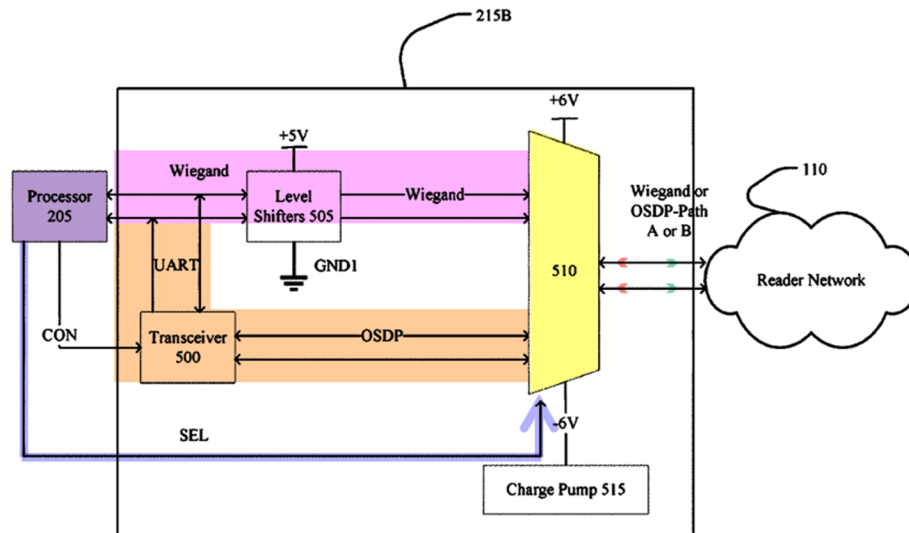
EX-1007, Fig. 1; Ex-1003, ¶138.

9. Claim 9

This in view of Guthery discloses “[t]he electronic credential reader of claim 8, wherein the two communication lines are configured and disposed to implement an Open Supervised Device Protocol (OSDP) interface.” EX-1003, ¶¶139-140.

As explained for Limitation 3[E], when in OSDP mode, selector 510 (yellow) configures the reader such that data is transmitted over the OSDP/RS485 path (orange) and the Wiegand/OSDP paths (green and red). EX-1005, 11:50-55; EX-1013, ¶58.

Fig. 5B



EX-1005/EX-1013, Fig. 5B. Therefore, a POSITA would have understood that when in OSDP mode, the Wiegand/OSDP paths (two pairs of green and red arrows) are also configured to implement the same interface as the OSDP/RS485 path (orange), *i.e.*, the Open Supervised Device Protocol (OSDP) interface. EX-1003, ¶140.

10. Claim 10

Preamble 10[P]

Chis in view of Guthery discloses “[t]he electronic credential reader of claim 3, wherein the computer readable medium further contains instructions, that when executed by the processor, perform the steps.” EX-1003, ¶¶142-143.

As explained above, Chis in view Guthery discloses claim 3. As explained

for Limitation 1[G], Chis discloses a computer readable medium, *e.g.*, memory 210, which includes various instructions that can be executed by a processor, *e.g.*, processor 205. EX-1005, 8:44-45, Fig. 4; EX-1013, ¶41, Fig. 4. Specifically, “memory 210 may include reader control instructions 415 that cause the processor 205 to control the reader 105 to operate in...[Wiegand] mode or...[OSDP] mode.” EX-1005, 10:58-60, 8:65-66, 9:5-6; EX-1013, ¶¶43, 52. As explained below, the processor in the Chis-Guthery reader performs the steps required by this claim. EX-1003, ¶143.

Limitation 10[A]

Chis discloses “**monitoring the bidirectional communication interface for input data.**” EX-1003, ¶¶144-147.

Chis discloses monitoring the bidirectional communication interface for input data when in **default mode**. EX-1005, 3:39-42 (“If an **OSDP message** is received at the reader before a credential is presented to the reader, the reader will switch to OSDP Mode (path=RS485) and save that configuration.”); 4:1-3 (“the reader is by default **listening for RS485 messages**”); EX-1013, ¶¶19-20. EX-1003, ¶145.

As explained for Limitation 1[G], Chis’s reader as modified by Guthery also monitors the bidirectional communication interface for input data when in

Wiegand mode. The processor in the Chis-Guthery reader monitors an existing LEDCTL wire for a signal that is less than 10 ms. EX-1006, 17:53-61. If such a signal is received, the reader switches from Wiegand mode (unidirectional) to OSDP mode (bidirectional). *Id.* EX-1003, ¶146.

Therefore, Chis in view of Guthery (and Chis alone) discloses “**monitoring the bidirectional communication interface** [*e.g.*, Chis’s OSDP/RS485 interface if in default mode; Chis’s LEDCTL wire as modified by Guthery if in Wiegand mode] **for input data** [*e.g.*, Chis’s OSDP/RS485 message if in default mode; Chis modified by Guthery where a signal lasting less than 10 ms is received when in Wiegand mode].” EX-1003, ¶¶144-147.

Limitation 10[B]

Chis discloses “**setting the electronic credential reader to a bidirectional mode upon detecting input data.**” EX-1003, ¶¶148-151.

Chis discloses that, when in **default mode**, the reader “will **switch** to OSDP Mode (path=RS485)” upon detecting an OSDP/RS485 message before receiving a credential. EX-1005, 3:39-42; EX-1013, ¶19; EX-1003, ¶149.

When in **Wiegand mode**, Chis’s reader as modified by Guthery switches to OSDP mode upon detecting an LEDTCL signal that is “less than 10 ms.” EX-1006, 17:54; *see* motivation-to-combine Chis and Guthery. EX-1003, ¶150.

Therefore, Chis in view of Guthery (and even Chis alone), discloses “**setting the electronic credential reader to a bidirectional mode** [*e.g.*, Chis’s OSDP mode] **upon detecting input data** [*e.g.*, Chis’s OSDP/RS485 message if in default mode; Chis modified by Guthery where a signal lasting less than 10 ms is received when in Wiegand mode].” EX-1003, ¶¶148-151.

Limitation 10[C]

Chis discloses “**recording a status of the bidirectional mode in a non-volatile storage.**” EX-1003, ¶¶152-155.

According to the ’830 Patent, “once the electronic credential reader...enter[s] bidirectional mode, the processor 102 performs the step of recording the bidirectional mode in a non-volatile storage 106.” EX-1001, 5:34-39. “In this way, if there is a power disruption, when power is restored, the processor 102 can check the previous communication mode based on data in non-volatile storage 106” and restore “previous mode.” *Id.*, 5:39-44. EX-1003, ¶153.

Like the ’830 Patent, Chis discloses that “[o]nce a reader establishes its mode of operation, then the reader **saves and retains that configuration in its local memory** (*e.g.*, **a non-volatile memory** co-located in a housing of the reader).” EX-1005, 3:7-10; *see* 3:39-42, 10:61-64, 12:58-59; EX-1013, ¶¶17, 19, 52, 66. Such “indicator...is referenced after the access control reader 105 is

disconnected from the power source 120 and then connected to another power source or reconnected to the power source 120” to “restore[the] previously saved configuration.” EX-1005, 13:65-14:3, 3:53-54; EX-1013, ¶¶19, 77. EX-1003, ¶154.

11. Claim 12

Limitations 12[P-D, and F-H]

Limitations 12[P-D, and F-H] are substantially identical to Limitations 3[P-D, and F-H], respectively, and are disclosed for the same reasons. EX-1003, ¶¶157-158 (including comparison chart).

Limitation 12[E]

For the reasons explained for Limitation 3[E] and illustrated in Chis’s Figure 5B, Chis discloses Limitation 12[E]—“**a switch [e.g., selector 510] coupled to the unidirectional communication interface [e.g., Wiegand interface (pink)], the bidirectional communication interface [e.g., OSDP/RS485 interface (orange)], and the plurality of external communication lines [e.g., Wiegand/OSDP paths (gray)].**” EX-1003, ¶159.

Limitation 12[I(P)]

Chis in view of Guthery discloses “**the computer readable medium contains instructions, that when executed by the processor, perform the steps.**” EX-1003, ¶¶160-161.

As explained for Limitation 10[P], Chis discloses a computer-readable medium, *e.g.*, memory 210, which includes various instructions that can be executed by a processor, *e.g.*, processor 205. EX-1005, 8:44-45, Fig. 4; EX-1013, ¶41, Fig. 4. Memory 210 includes reader control instructions 415 that configure the reader to operate in Wiegand or OSDP mode. EX-1005, 10:58-60, 8:65-66, 9:5-6; EX-1013, ¶¶43, 52. As explained below, the processor in the Chis-Guthery reader performs the steps required by this claim. Since modifying Chis’s reader based on Guthery requires only software changes (with no or minor hardware changes), a POSITA would have understood that the computer readable medium in the Chis-Guthery reader also includes instructions executed by the processor to perform the steps required by this claim. EX-1003, ¶161; motivation-to-combine Chis and Guthery.

Limitation 12[I(1)]

Chis in view of Guthery discloses and renders obvious “**monitoring the credential receiver for a bidirectional status code.**” EX-1003, ¶¶162-167.

According to the ’830 Patent, “**a special credential** can be used to **switch**

the communication mode. For example, **an installer** can have a **special credential** that when presented to the electronic credential reader, causes the...reader to transition to bidirectional communication mode.” EX-1001, 6:66-7:4. “[T]he special credential is a ‘Prox’ (125 kHz) and/or Smart or NFC (13.56 MHz) card with a predetermined numeric value encoded into it.” *Id.*, 7:4-6; 7:53-60 (“[A]n **installer or other qualified person** can set the electronic credential reader in bidirectional communication mode by providing the credential which includes the **bidirectional status code**. In embodiments, this credential is a ‘Prox’ (125 kHz) and/or Smart or NFC (13.56 MHz) card with a **predetermined numeric value corresponding to a special instruction** to switch to the bidirectional communication mode.”). EX-1003, ¶163.

Like the ’830 Patent, using a special credential to change a reader’s communication mode is rendered obvious by Guthery. According to Guthery, “**a person** [may] visit the card reader and perform various maintenance procedures (e.g., update software/firmware in the reader, **change operating characteristics**, change keys, etc.)...” EX-1006, 12:50-53. A POSITA would have understood that, in the context of Guthery, which is directed to communication mode switching, operating characteristics include the reader’s **communication mode**. Guthery further discloses that “these maintenance procedures may include **entering updated data into the reader** using the radio frequency (RF)

communication capabilities of the reader together **via a special credential, NFC-based device, or via a communications port using infrared communications.**”

Id., 12:55-59. Thus, a POSITA would have understood that a reader’s communication mode, *e.g.*, Wiegand/unidirectional mode or bidirectional mode, may be changed by “entering updated data into the reader...**via a special credential, NFC-based device, or via a communications port using infrared communications.**” *Id.* A POSITA would also have understood that in order for a reader to be able to change its communication mode upon receiving the “updated data,” such “updated data” must be associated with the target mode or status. EX-1003, ¶164.

Chis further discloses that “the communication channel 116 [between credential 112 and reader 105] may correspond to...a near field communication (NFC) channel...[or] an Infrared communication channel.” EX-1005, 5:38-42, 8:52-54, 9:35-38; EX-1013, ¶¶27, 42, 46. Therefore, a POSITA would have found it obvious to set Chis’s reader’s mode, *e.g.*, to Wiegand mode or to OSDP mode, by “entering updated data into the reader” via the communication channel 116. EX-1006, 12:55-56; EX-1003, ¶165.

A full motivation-to-combine Chis and Guthery is included following claim 1. In addition, a POSITA would have found it obvious to combine the access control reader disclosed by Chis with the manual credential-based mode

configuration disclosed by Guthery because such manual configuration allows flexible on-site installation, configuration, debugging, and testing. Using a special credential to configure a reader enables the user to bypass environmental restrictions (such as network conditions) and to conveniently configure a reader (without remembering and inputting configuration settings). Guthery's manual credential-based communication mode would have been used to manually configure a reader, including Chis's reader. It was well within the skill of a POSITA to implement such manual configuration by employing a "numeric value encoded," *i.e.*, a "bidirectional status code" on the "special credential." EX-1001, 7:4-6; EX-1003, ¶166.

Therefore, Chis in view of Guthery discloses and renders obvious **"monitoring the credential receiver [e.g., Chis's device interfaces or antennas] for a bidirectional status code [e.g., data (as rendered obvious by Guthery) associated with OSDP mode]."** EX-1003, ¶¶162-167.

Limitation 12[I(2)]

Chis in view of Guthery discloses **"changing a communication mode of the electronic credential reader from a unidirectional mode to a bidirectional mode by setting the electronic credential reader to the bidirectional mode upon detecting the bidirectional status code."** EX-1003, ¶¶168-170.

As explained for Limitation 3[I], Chis in view of Guthery discloses “changing a communication mode of the electronic credential reader from a unidirectional mode to a bidirectional mode by setting the electronic credential reader to the bidirectional mode.” As explained in previous Limitation 12[I(1)], such changing of a communication mode, *e.g.*, from Wiegand mode to OSDP mode, may be triggered by entering data associated with OSDP mode into the reader via the communication channel between credential 112 and the reader’s credential interface and/or antenna. EX-1003, ¶169.

Therefore, Chis in view of Guthery discloses “**changing a communication mode of the electronic credential reader from a unidirectional mode** [*e.g.*, Chi’s Wiegand mode] **to a bidirectional mode** [*e.g.*, Chis’s OSDP mode] **by setting the electronic credential reader to the bidirectional mode** [*e.g.*, Chis’s OSDP mode] **upon detecting the bidirectional status code** [*e.g.*, data (as taught by Guthery) associated with OSDP mode].” EX-1003, ¶¶168-170.

Limitation 12[I(3)]

As explained for Limitation 10[C], Chis discloses “**recording the bidirectional mode in a non-volatile storage.**” EX-1003, ¶171.

12. Claim 14

Preamble 14[P]

This discloses “[a] **computer-implemented method for configuring an electronic credential reader.**” EX-1003, ¶¶173-175.

This discloses “[a] **method of operating an access control reader**, the method comprising:...causing the access control reader to operate in a second mode of operation rather than a first mode of operation...” EX-1005/EX-1013, claim 1; Title (“**Methods to combine and auto-configure Wiegand and RS485**”). As explained for Limitation 1[G], This discloses configuring the reader in default mode first. EX-1005, 2:56-58, 3:34-35; EX-1013, ¶¶16, 19. If the reader receives an OSDP/RS485 message before any credential, the reader enters the OSDP mode. EX-1005, 2:59-65; EX-1013, ¶16. Otherwise, if the reader receives a credential first, the reader enters the Wiegand mode. EX-1005, 2:65-3:3; EX-1013, ¶16. EX-1003, ¶174.

This discloses that “the reader 208 includes...a memory 210 storing instructions for execution by the processor 205. When executed by the processor, these instructions enable the processor to carry out needed functions, including, for example, auto-configuration of the reader’s mode of operation.” EX-1005, 8:42-48; EX-1013, ¶41. Thus, the disclosed method is **computer-implemented**. EX-1003, ¶175.

Limitation 14[A]

Chis in view of Guthery discloses **“initializing the electronic credential reader in a unidirectional communication mode.”** EX-1003, ¶¶176-180.

As explained for Limitation 1[G], Chis initializes its reader in default mode, “which sets the path for RS485 (or OSDP mode).” EX-1005, 2:55-56; EX-1013, ¶16; EX-1003, ¶177.

Guthery, in contrast, discloses initializing the reader in Wiegand/unidirectional mode. Guthery discloses “Upstream Device-Initiated Mode Change,” where a reader is initialized in unidirectional mode until an upstream device initiates a mode change. EX-1006, 17:23-37 (“the improved methods [*e.g.*, bidirectional communication] will automatically be turned on by upstream devices”). EX-1003, ¶178.

A POSITA would have found it obvious to incorporate Guthery’s Wiegand-to-OSDP mode switching functionality and implementation into Chis’s reader, *i.e.*, to start with Wiegand mode per Guthery. *See* motivation-to-combine Chis and Guthery. EX-1003, ¶179.

Therefore, Chis in view of Guthery discloses **“initializing the electronic credential reader in a unidirectional communication mode [*e.g.*, Wiegand mode].”** EX-1003, ¶¶176-180.

Limitation 14[B]

The claim requires **“transmitting received credential information from the electronic credential reader to a processor via a unidirectional communication interface while in the unidirectional communication mode,”** which is disclosed by Chis. EX-1003, ¶¶181-184.

Although not described in the '830 Patent, to the extent that this limitation requires a “processor” external to the reader, Chis discloses it. Chis discloses **“transmitting received credential information from the electronic credential reader to a processor [in an access control panel] via a unidirectional communication interface while in the unidirectional communication mode.”**

As shown in Figure 1 below, reader 105 (blue) receives credential information from credential 112 (yellow) via communication channel 116. EX-1005, 7:36-40; EX-1013, ¶33. The received credential information is then transmitted from reader 105 (blue) to access control panel 115 (green) via reader network 110. EX-1005, 8:8-10, 4:51-55, 10:24-30 (“The access control panel 115 may further include a **processor 240.**”), Fig. 3; EX-1013, ¶¶37, 23.



EX-1005/EX-1013, Fig. 1. As explained for Limitation 1[B], This discloses that, when in Wiegand/unidirectional mode, processor 205 sends data to reader network 110 via the Wiegand path/interface. EX-1005, 11:51-57; EX-1013, ¶58. EX-1003, ¶182.

To the extent that the recited “processor” is part of the reader, Chis discloses this as explained above for Limitation 1[B]. EX-1003, ¶183.

Therefore, Chis discloses “**transmitting received credential information** [e.g., credential; format and reader status data] **from the electronic credential reader** [e.g., credential interface 220] **to a processor** [e.g., processor 205 or processor 240] **via a unidirectional communication interface** [e.g., unidirectional communications interface between credential interface 220 and processor 240 or the Wiegand interface] **while in the unidirectional communication mode** [e.g.,

standard Wiegand mode].” EX-1003, ¶¶181-184.

Limitation 14[C]

Limitation 14[C] requires “**monitoring a bidirectional communication interface for input data**,” and is substantially identical to Limitation 10[A]. Therefore, for the reasons explained for Limitation 10[A], Chis in view of Guthery discloses “**monitoring the bidirectional communication interface** [e.g., monitoring Chis’s LEDCTL wire as taught by Guthery] **for input data** [e.g., a signal lasting less than 10 ms as taught by Guthery].” EX-1003, ¶185.

Limitation 14[D]

The claim requires “**setting the electronic credential reader, upon detecting input data on the bidirectional communication interface, from the unidirectional communication mode to a bidirectional communication mode in which any further received credential information is transmitted from the electronic credential reader to the processor via a bidirectional communication interface**,” which is disclosed by Chis in view of Guthery. EX-1003, ¶¶186-188.

For the reasons explained for Limitations 10[A-B], Chis in view of Guthery discloses “**setting the electronic credential reader, upon detecting input data**

[e.g., a signal lasting less than 10 ms as taught by Guthery] **on the bidirectional communication interface** [e.g., Chis’s LEDCTL wire as taught by Guthery], **from the unidirectional communication mode** [e.g., Chis’s Wiegand mode] **to a bidirectional communication mode** [e.g., Chis’s OSDP mode].” EX-1003, ¶187.

Chis further discloses that “any further received credential information is transmitted from the electronic credential reader to the processor via a bidirectional communication interface.” As explained for Limitation 3[I], Chis discloses “**a second communication mode** [e.g., OSDP mode] **in which the credential reader uses the bidirectional communication interface** [e.g., OSDP/RS485 interface] **to communicate with the processor.**” After the reader switches to OSDP/bidirectional mode, the reader “save[s] that configuration.” EX-1005, 3:41-42; 3:42-45; 3:7-10; EX-1013, ¶¶17, 19. A POSITA would have understood that once the reader switches to OSDP/bidirectional mode, any further received credential information will be transmitted using the OSDP/RS485 (bidirectional) interface. EX-1003, ¶188.

B. GROUND #2: Claim 11 is rendered obvious by Chis, Guthery, and Adams

1. Claim 11

Limitations 11[P-C] and 11[G]

Limitations 11[P-C] and 11[G] are identical to Limitations 3[P-C] and 3[G], respectively, and are disclosed for the same reasons. EX-1003, ¶¶191-192 (including comparison chart).

Limitation 11[D]

Limitation 11[D] requires “**a plurality of external communication lines, wherein the bidirectional communication interface and the unidirectional communication interface are configured to share the plurality of external communication lines,**” which is substantially identical to the combination of Limitations 3[D] and 3[H]. Therefore, for the reasons explained for Limitations 3[D] and 3[H], This discloses Limitation 11[D]. EX-1003, ¶¶193-194.

Limitations 11[E-F]

Limitations 11[E-F] are identical to Limitations 12[E-F], respectively, and are disclosed for the same reasons. EX-1003, ¶¶195-196 (including comparison chart).

Limitation 11[H]

The claim requires “**a one-time programmable fuse disposed between the unidirectional communication interface and the processor,**” which is disclosed

by Adams as applied to the Chis-Guthery reader. EX-1003, ¶¶197-202.

According to the '830 Patent, “once the electronic credential reader is put into bidirectional mode, the unidirectional communication interface is permanently disabled” by “severing the one-time programmable fuse.” EX-1001, 5:26-31. EX-1003, ¶198.

As explained above, Chis discloses putting a reader into OSDP/bidirectional mode. EX-1005, 2:59-63; EX-1013, ¶16. Although Chis does not disclose severing a “one-time programmable fuse” to permanently disable an interface, Adams discloses this well-known concept. EX-1003, ¶199.

Adams teaches using “**one-time programmable memory (OTPM) circuit** (e.g., **fuses, anti-fuses**, etc.)...[to] generate one or more signals indicative of a security level of the environment,...where a state of each signal is determined by a state (e.g., **intact or blown**) of a respective **fuse**.” EX-1008, ¶20. Adams teaches that “customers [of a chip supplier] may [] develop unique firmware on an unsecured portion...of the chip with access to the secure portion of the chip being accomplished only through predefined communication interfaces....[O]nce development of the unique firmware of the customer is complete, the customer can **disable the remaining debug interface(s)**, for example, **by blowing another fuse**.” EX-1008, ¶39. EX-1003, ¶200.

As explained in a full motivation-to-combine section below, a POSITA

would have found it obvious to incorporate the one-time programmable (OTP) fuse taught by Adams into Chis's reader to permanently disable the Wiegand circuitry after the reader is set to OSDP mode. A POSITA familiar with use of OTP fuses would also have found it obvious to put the OTP fuse between the unidirectional communication interface and the processor. *See* motivation-to-combine Chis and Adams following claim 11. Similarly, a POSITA would have found it obvious to incorporate Adams's OTP fuse into the Chis-Guthery reader. EX-1003, ¶¶201.

Therefore, the Chis-Guthery reader as modified in view of Adams discloses **“a one-time programmable fuse disposed between the unidirectional communication interface and the processor.”** EX-1003, ¶¶197-202.

Limitations 11[I(P)] and 11[I(1)]

Limitations 11[I(P)] and 11[I(1)] are substantially identical to Limitations 10[P] and 10[A], respectively, and are disclosed for the same reasons. EX-1003, ¶¶203-204 (including comparison chart).

Limitation 11[I(2)]

The claim requires **“severing the one-time programmable fuse upon detection of input data,”** which is disclosed by Adams as applied to the Chis-Guthery reader. EX-1003, ¶¶205-207.

As explained for Limitation 11[H], Adams as applied to the Chis reader discloses severing, or blowing, the OTP fuse to permanently disable the Wiegand interface circuitry **after the reader is set to OSDP mode**. As explained for Limitation 10[B], Chis in view of Guthery discloses “**setting the electronic credential reader to a bidirectional mode** [*e.g.*, Chis’s OSDP mode] **upon detecting input data** [*e.g.*, Chis’s OSDP/RS485 message if in default mode; a signal lasting less than 10 ms as taught by Guthery if in Wiegand mode].” A POSITA would have understood that upon detecting input data, the Chis-Guthery reader as modified by Adams not only is set to OSDP/bidirectional mode but also severs the OTP fuse to make the configuration permanent. EX-1003, ¶206.

Therefore, Adams as applied to the Chis-Guthery reader discloses “**severing the one-time programmable fuse upon detection of input data** [*e.g.*, a signal lasting less than 10 ms as taught by Guthery if in Wiegand mode].” EX-1003, ¶¶205-207.

Limitation 11[I(3)]

The claim requires “**changing a communication mode of the electronic credential reader from a unidirectional mode to a bidirectional mode**,” which is disclosed by Chis in view of Guthery. EX-1003, ¶¶208-209.

As explained for Limitation 10[B], Chis in view of Guthery discloses

“**setting the electronic credential reader to a bidirectional mode** [*e.g.*, Chis’s OSDP mode] **upon detecting input data** [*e.g.*, Chis’s OSDP/RS485 message if in default mode; a signal lasting less than 10 ms as taught by Guthery if in Wiegand mode].” In other words, if the Chis-Guthery reader is in Wiegand mode, it “chang[es] a communication mode of the electronic credential reader from a unidirectional mode to a bidirectional mode” upon detecting a signal lasting less than 10 ms. EX-1003, ¶209.

Motivation to Combine Chis and Adams

A POSITA would have found it obvious to combine Chis and Adams. EX-1003, ¶¶210-214.

Chis and Adams are **analogous art** to the ’830 Patent because they are all directed to access control to prevent unauthorized access. EX-1001, 1:5-7; EX-1005, 1:23-27; EX-1013, ¶2; EX-1008, ¶3. Both references (and the ’830 Patent) are in class G06F. Similar to Chis (and the ’830 Patent), which endeavors to improve security of the system by implementing **a switch** to **selectively enable** the Wiegand interface or OSDP interface, Adams also endeavors to improve security of the chip by “implement[ing] **a selector** between the block 102 and the block 104...to allow **selective enabling** of the debug interface 100 to the block 102 only...or to both the block 102 and the block 104....” EX-1008, ¶19; EX-1001,

4:59-5:15; EX-1005, 11:46-57; EX-1013, ¶58. EX-1003, ¶211.

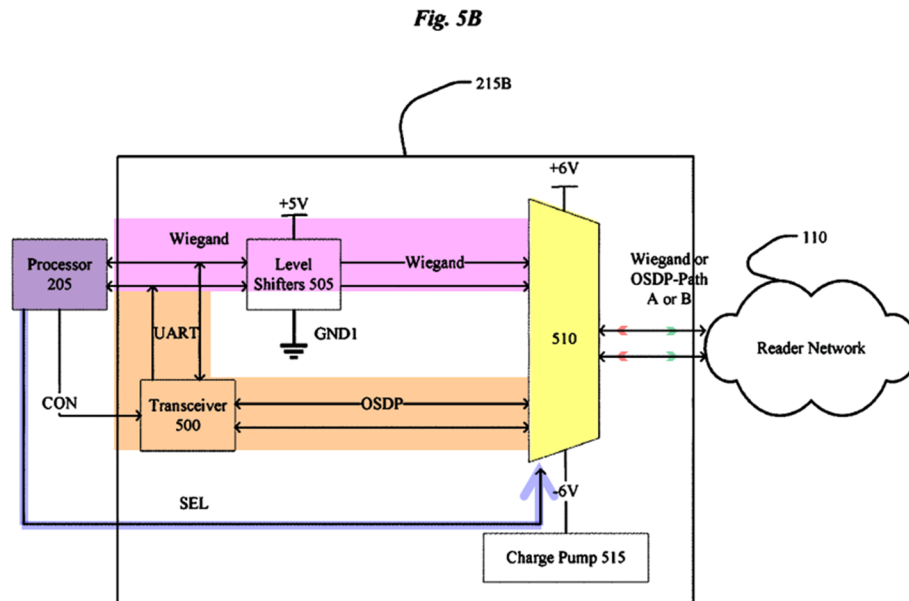
A POSITA would have been **motivated** to incorporate Adams’s use of OTP fuse into Chis’s reader for many reasons. First, Chis discloses that, although “Wiegand communications interface is a predominant standard,” “OSDP is gaining market share.” EX-1005, 1:64-67; EX-1013, ¶12. It is well-known that “OSDP...can be implemented...to replace traditional Wiegand protocol in order to enhance the communication security.” EX-1015, ¶115.¹¹ Because OSDP offers such advantages over the Wiegand protocol, a POSITA would have understood the **desire for securing a reader in the more-secured OSDP mode** as it navigates power cycles. Adams teaches securing a chip to utilize the selected firmware by blowing an OTP fuse. EX-1008, ¶39. Therefore, a POSITA would have been motivated to further improve security by incorporating Adams’s OTP fuse into Chis’s reader such that by blowing the fuse—making permanent Chis’s switch to OSDP mode. Second, as explained below, modifying Chis’s reader based on Adams involves incorporating Adams’s OTP fuse in the same way that OTP fuses had been commonly used, *e.g.*, disabling a circuit, which a POSITA would have been motivated to implement to **yield predictable results**. EX-1003, ¶212.

¹¹ Douglas (EX-1015) claims priority to US Application No. 62/464,831, which was filed on February 28, 2017, and is prior art under §102(a)(2).

A POSITA would have had a **reasonable expectation of success** in incorporating Adams's OTP fuse into Chis's reader. It was well-known in the art that an OTP fuse may be controlled by a processor to disable a circuit. EX-1011¹², 1:28, 3:38-39 (“**an OTP memory** operatively connected to the **processor**”), 9:37-41; EX-1012¹³, claim 9 (“a **processor** configured to...**write** patch code...**into a one-time programmable (OTP) memory** and generate a system reset signal.”), claim 13. As shown in Chis's Figure 5B, processor 205 (purple) is coupled to the Wiegand interface (pink):

¹² Chung (EX-1011) issued on December 23, 2014 and is prior art under §102(a)(1).

¹³ Guo (EX-1012) published on March 30, 2017 and is prior art under §102(a)(1).



EX-1005/EX-1013, Fig. 5B. A POSITA wanting to disable the Wiegand mode would disable the Wiegand circuitry by placing an OTP fuse in line with that circuitry, *i.e.*, the fuse would be placed anywhere along the pink Wiegand circuitry in Figure 5B above, *e.g.*, between processor 205 (purple) and the Wiegand interface (pink), allowing processor 205 (purple) may provide a signal to blow the OTP fuse and permanently disable the Wiegand interface (pink). A POSITA would have known that this simple modification would produce a working system. EX-1003, ¶¶213-214.

C. GROUND #3: Claim 13 is rendered obvious by Chis, Guthery, in view of Panian

1. Claim 13

Limitations 13[P-I(P)]

Limitations 13[P-I(P)] are identical to Limitations 12[P-I(P)], respectively, and are disclosed for the same reasons. EX-1003, ¶¶217-218 (including comparison chart).

Limitation 13[I(1)]

Limitation 13[I(1)] is identical to Limitation 11[I(3)] and is disclosed for the same reasons. EX-1003, ¶219.

Limitations 13[I(2)-I(4)]

Limitations 13[I(2)-I(4)] are identical to Limitations 10[A-C], respectively, and are disclosed for the same reasons. EX-1003, ¶¶220-221 (including comparison chart).

Limitation 13[I(5)]

The claim requires “**establishing a hysteresis timer**,” which is disclosed by Panian. EX-1003, ¶¶222-226.

The '830 Patent discloses “**resetting the timer** upon reception of a bidirectional message, and reverting the electronic credential receiver to a hunt mode upon **expiry of the hysteresis timer.**” EX-1001, 8:49-52, Fig. 5. The '830 Patent's hysteresis timer facilitates reader to change from bidirectional mode back to hunt mode. EX-1003, ¶223.

As shown in Figures 4A-4B below, Panian also discloses a “procedure for changing from Communication mode back to the Default mode.” EX-1009, 7:56-57.

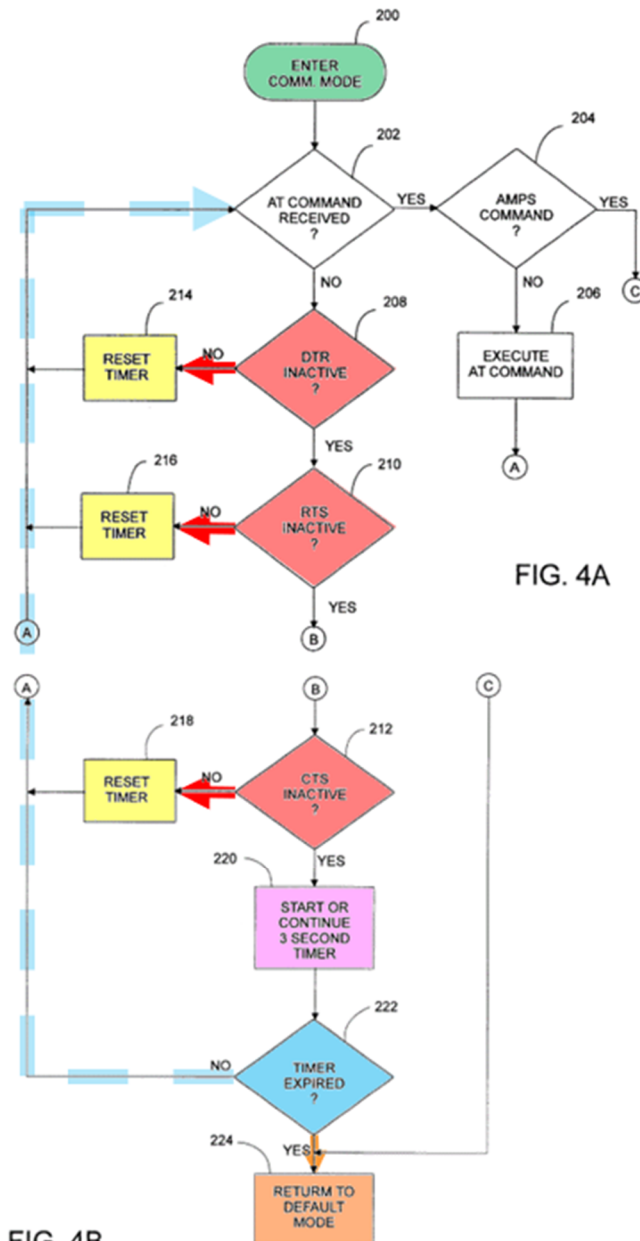


FIG. 4B

EX-1009, Figs. 4A-4B. When “[i]n the Communication mode [green], the mobile communication device 10 continuously monitors or polls the DTR, RTS, and CTS ports (blocks 208, 210, and 212) [red].” *Id.*, 7:57-60. “If the DTR, CTS and RTS signals are all inactive, the control unit 16 either **starts** or **continues a 3 second**

timer (block 220) [pink].” *Id.*, 7:60-62. EX-1003, ¶224.

It would have been obvious for a POSITA to implement Panian’s timer in Chis’s reader. *See* motivation-to-combine Chis and Panian following claim 13. Similarly, a POSITA would have found it obvious to implement Panian’s timer in the Chis-Guthery reader. EX-1003, ¶225.

Therefore, Panian discloses “**establishing** [*e.g.*, starting] **a hysteresis timer** [*e.g.*, 3-second timer].” EX-1003, ¶¶222-226.

Limitation 13[I(6)]

The claim requires “**resetting the hysteresis timer upon reception of a bidirectional message,**” which is disclosed by Panian as applied to the Chis-Guthery reader. EX-1003, ¶¶227-230.

According to the ’830 Patent, “[t]he hysteresis timer is reset when input data is received on the bidirectional communication interface.” EX-1001, 8:13-15. Otherwise, “[i]f the hysteresis timer expires, the electronic credential reader reverts to [default] hunt mode, where credential data is sent via the unidirectional interface.” *Id.*, 8:19-21. EX-1003, ¶228.

Like the ’830 Patent’s timer, Panian’s timer is also used for facilitating mode-switching. As shown in Figures 4A-4B, “[i]f the DTR, CTS and RTS signals are all inactive, the control unit 16 either starts or continues a 3 second

timer (block 220) [pink].” EX-1009, 7:60-62.

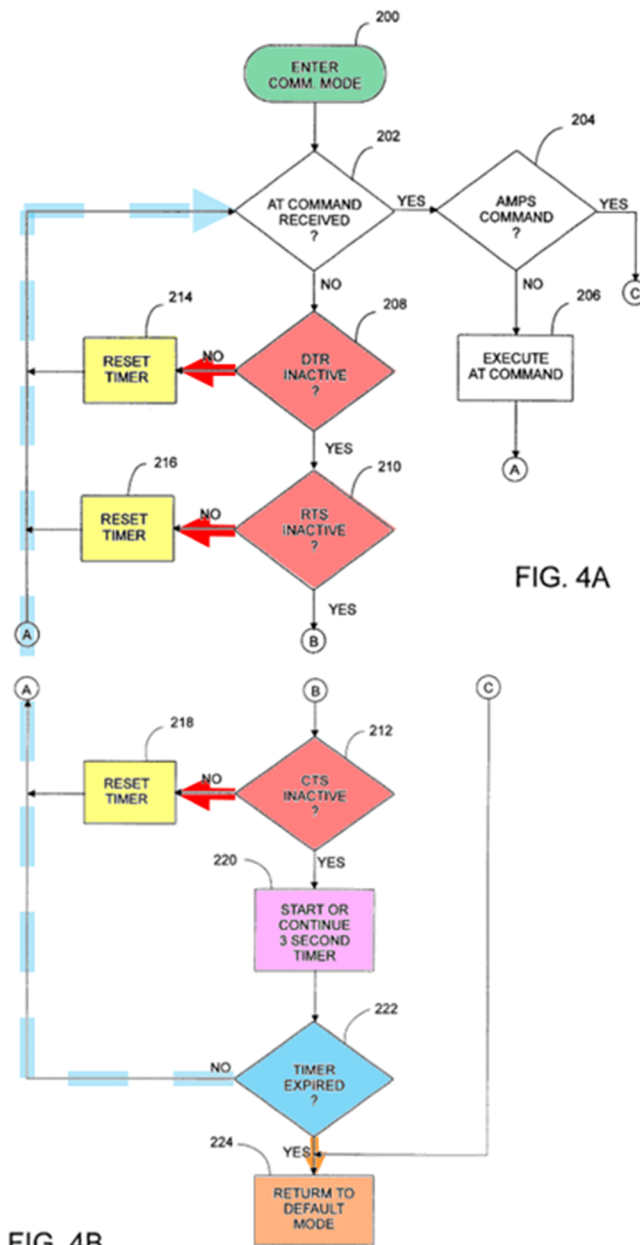


FIG. 4A

FIG. 4B

EX-1009, Figs. 4A-4B. Before the timer expires, *i.e.*, “[d]uring the ensuing 3 second interval, the control unit 16 continues to monitor the DTR, CTS and RTS signals [red]. If one of these signals becomes active[red arrows]..., the control unit

16 **resets the timer** (blocks 214, 216, 218) [yellow].” *Id.*, 7:62-64. Thus, Panian discloses “resetting the [] timer upon reception of” any of the DTR, CTS and RTS signals. As explained below, a POSITA would have found it obvious to implement Panian’s timer in Chis’s reader. As explained there, since Panian’s DTR, CTS and RTS signals indicate the device being active in Communication mode, a POSITA would have found it obvious to treat usage of Panian’s DTR, CTS and RTS signals as bidirectional messages received by the Chis-Guthery reader, which indicate that the reader is active in OSDP/bidirectional mode. *See* motivation-to-combine Chis and Panian; EX-1003, ¶229.

Therefore, Panian as applied to the Chis-Guthery reader discloses “**resetting the hysteresis timer** [*e.g.*, Panian’s 3-second timer] **upon reception of a bidirectional message** [*e.g.*, Chis’s bidirectional message].” EX-1003, ¶¶227-230.

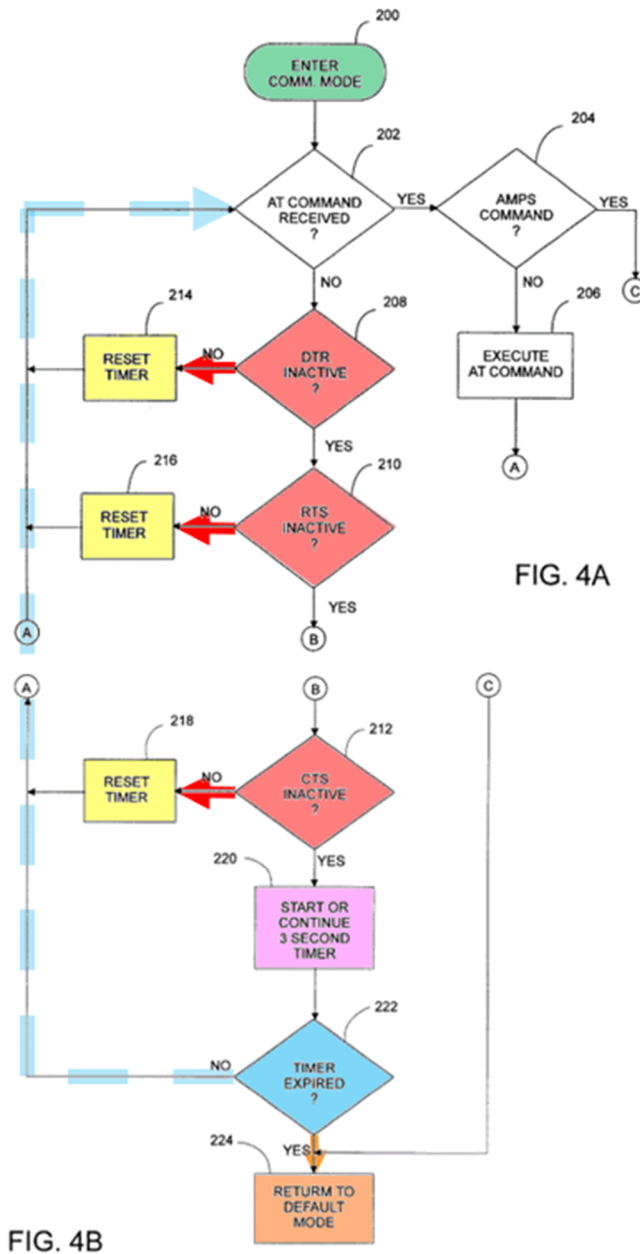
Limitations 13[I(7)]

The claim requires “**reverting the electronic credential reader to a hunt mode upon expiry of the hysteresis timer**,” which is disclosed by Panian as applied to the Chis-Guthery reader. EX-1003, ¶¶231-235.

According to the ’830 Patent, “[i]f the hysteresis timer expires, the electronic credential reader reverts to hunt mode, where credential data is sent via the unidirectional interface.” EX-1001, 8:19-21, 8:52-54. In other words, “the

electronic credential reader **reverts to [hunt mode and then] unidirectional (e.g. Wiegand) mode to allow the access control system to continue to function**” when bidirectional communication is no longer feasible. *Id.*, 8:61-64. EX-1003, ¶232.

Panian’s timer achieves the same objective—reverting to a default mode when communicating in the other mode is no longer feasible. As shown in Figures 4A-4B below, if the timer expires (orange arrow), *i.e.*, “[i]f neither signal becomes active during the 3 second interval (block 222) [blue], the control unit **16 assumes that the computer has been disconnected and switches to Default mode** (block 224) [orange].” EX-1009, 7:66-8:2.



EX-1009, Figs. 4A-4B. EX-1003, ¶233.

As explained below, a POSITA would have found it obvious to implement Panian's timer in Chis's reader. Panian discloses that, when the device is in Default mode, I/O ports 7-9 are switched to EXTAUD, MUTE, and PORTHF.

EX-1009, 4:34-36, 6:18-21. When the device is in Communication mode, I/O ports 7-9 are switched to RTS, CTS, and DTR. *Id.*, 4:36-39, 6:21-23. Panian uses a timer such that the device is automatically switched from Communication mode back to Default mode if none of “the DTR, CTS and RTS signals” “become[] active” before the timer expires. *Id.*, 7:57-8:2. A POSITA would have understood that upon timer expiration, switching from Communication mode to Default mode disclosed in Panian is **analogous to** the switching from OSDP/bidirectional mode to default mode in Chis’s reader, or the Chis-Guthery reader. *See* motivation-to-combine Chis and Panian; EX-1003, ¶234.

Therefore, Panian as applied to the Chis-Guthery reader discloses “**reverting the electronic credential reader to a hunt mode** [*e.g.*, Chis’s default mode] **upon expiry of the hysteresis timer** [*e.g.*, Panian’s 3-second timer].” EX-1003, ¶¶231-235.

Motivation to Combine Chis and Panian

A POSITA would have found it obvious to combine Chis and Panian. EX-1003, ¶¶236-243.

Chis and Panian are **analogous art** to the ’830 Patent because they are all directed to automatic external device detection and mode switching. For example, Chis (and the ’830 Patent) is directed to automatically detecting what type of

access controller a reader is connected to and automatically switching the reader to an appropriate mode. *See* EX-1001, 3:10-16; EX-1005, 9:19-26; EX-1013, ¶45.

Similarly, Panian is directed to automatically detecting what type of external device a mobile communication device is connected to and automatically switching the mobile communication device to an appropriate mode. EX-1009, Abstract. In both references (and the '830 Patent), the communication device utilizes different communication interfaces when operating in different modes. EX-1001, 2:48-53; EX-1005, 3:4-7; EX-1013, ¶17; EX-1009, 3:3-5. EX-1003, ¶237.

Moreover, like Chis (and the '830 Patent), Panian discloses switching communication interfaces using a switch. As shown in Panian Figures 2A-2B, “[t]he system interface 30 includes a system connector 32 and **switching circuits 34**,” which “functions to redirect the inputs and outputs at the system connector 32 **depending on the type of external device 50** that is connected.” EX-1009, 4:25-26, 4:31-34.

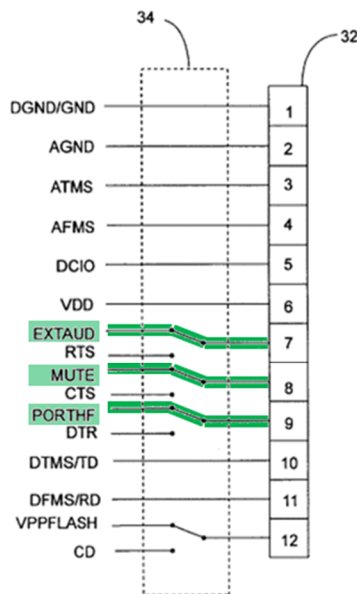


FIG. 2A

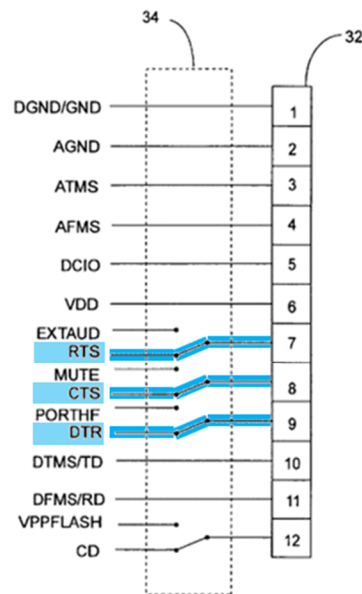


FIG. 2B

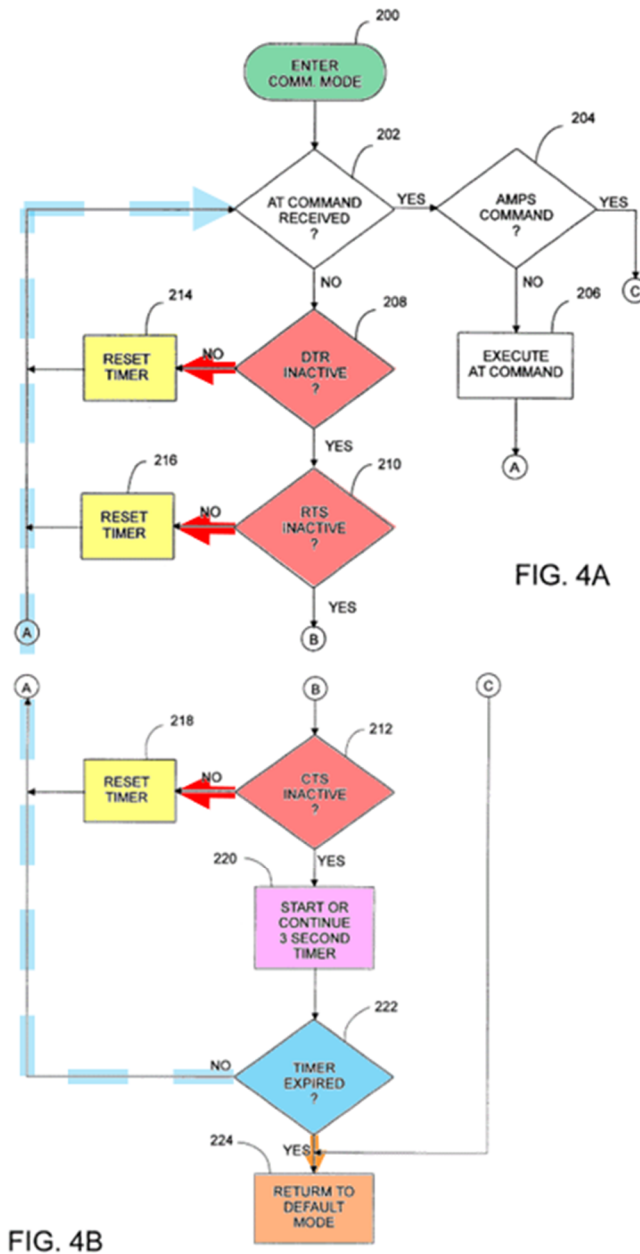
EX-1009, Figs. 2A-2B. “When a phone accessory...is connected, the switching circuits 34 are configured in a **Default mode**, as shown in FIG. 2A,” where I/O ports 7-9 are **switched to EXTAUD, MUTE, and PORTHF (green)**. *Id.*, 4:34-36, 6:18-21. “When an external communication terminal is connected, the switching circuits 34 are configured in a **Communication mode**, as shown in FIG. 2B,” where I/O ports 7-9 are switched to **RTS, CTS, and DTR (blue)**. *Id.*, 4:36-39, 6:21-23. EX-1003, ¶238.

Panian discloses that “[t]he mobile communication device 10 switches back to Default mode when the control unit 16 senses that the computer or DTE is no longer connected.” EX-1009, 5:7-9. This is implemented by using a timer. With

respect to Figures 4A-4B, Panian discloses:

In the Communication mode, the mobile communication device 10 continuously monitors or polls the DTR, RTS, and CTS ports (blocks 208, 210, and 212). **If the DTR, CTS and RTS signals are all inactive**, the control unit 16 either **starts or continues a 3 second timer (block 220) [pink]**. During the ensuing 3 second interval, the control unit 16 continues to monitor the DTR, CTS and RTS signals. **If one of these signals becomes active before the timer expires, the control unit 16 resets the timer (blocks 214, 216, 218) [yellow]**. **If neither signal becomes active during the 3 second interval (block 222)**, the control unit 16 assumes that the computer has been disconnected and **switches to Default mode (block 224) [orange]**.

EX-1009, 7:57-8:2. EX-1003, ¶239.



EX-1009, Figs. 4A-4B.

A timer may be used in devices capable of performing sophisticated functions, such as automatic mode-switching. Chis itself uses a timer to limit how long a reader can operate in default mode before switching to Wiegand mode or

OSDP mode. EX-1005, Figs. 6-7; EX-1013, Figs. 6-7. However, Chis's reader can only revert to default mode upon reset. EX-1005, 3:54-58; EX-1013, ¶19. EX-1003, ¶240.

A POSITA would have been **motivated** to incorporate Panian's timer into Chis's reader such that the reader is able to switch from OSDP/bidirectional mode to default mode (without going through a reset) if the bidirectional interface is no longer active, *i.e.*, no bidirectional message is received by the reader for before the timer expires. A POSITA would have understood that such OSDP-to-default mode switching is **desirable because it would allow the reader to re-evaluate the environment and decide which communication interface to use, instead of being stuck with an inactive OSDP/RS485 interface**. A POSITA would have been motivated to implement Panian's timer in Chis's reader to **facilitate mode switching because the combined Chis-Panian reader would be more versatile, responsive and useful in test environments or other situations where the controller would be expected to be changed or paused from sending signals on the bidirectional interface**. A POSITA would have been motivated to use this timer to correct unwanted mode switching—caused by a false signal (*e.g.*, noise). EX-1003, ¶241.

A POSITA would have had a **reasonable expectation of success** in incorporating Panian's timer in Chis's reader. Chis's reader already includes a

timer for facilitating mode switching control. EX-1005, Figs. 6-7; EX-1013, Figs. 6-7. Both references concern switching between different communication interfaces. EX-1005, 2:54-3:3; EX-1013, ¶16; EX-1009, 6:18-23. In both references, the device determines whether the current communication interface is active based on whether any signal or message is received from that interface—Chis’s bidirectional message for determining for bidirectional interface and Panian’s DTR, RTS, or CTS signal for determining for RS-232 interface. EX-1005, 3:39-42; EX-1013, ¶19; EX-1009, 8:57-60, 4:58-60. Therefore, a POSITA would have understood that incorporating Panian’s timer in Chis’s reader would result in a working device. EX-1003, ¶242.

Both Chis and Panian are directed to configurations for a device that communicates with an external device via multiple interfaces, and the switching thereof. For all the above reasons, a POSITA would have found it obvious to incorporate Panian’s timer in Chis’s reader. EX-1003, ¶243.

D. GROUND #4: Claim 15 is rendered obvious by Chis and Brennan

1. Claim 15

Preamble 15[P]

Preamble 15[P] is identical to Preamble 14[P] and is disclosed for the same reasons. EX-1003, ¶246.

Limitation 15[A]

The claim requires “**initializing the electronic credential reader in a hunt mode,**” which is disclosed by Chis. EX-1003, ¶¶247-250.

According to the '830 Patent, “hunt mode is the default mode of operation.” EX-1001, 7:16. As shown in Fig. 4 below, “in hunt mode [step 450], the electronic credential reader is monitoring [step 452] the bidirectional communication interface for any input data (e.g. RS-485 data).” *Id.*, 7:17-18.

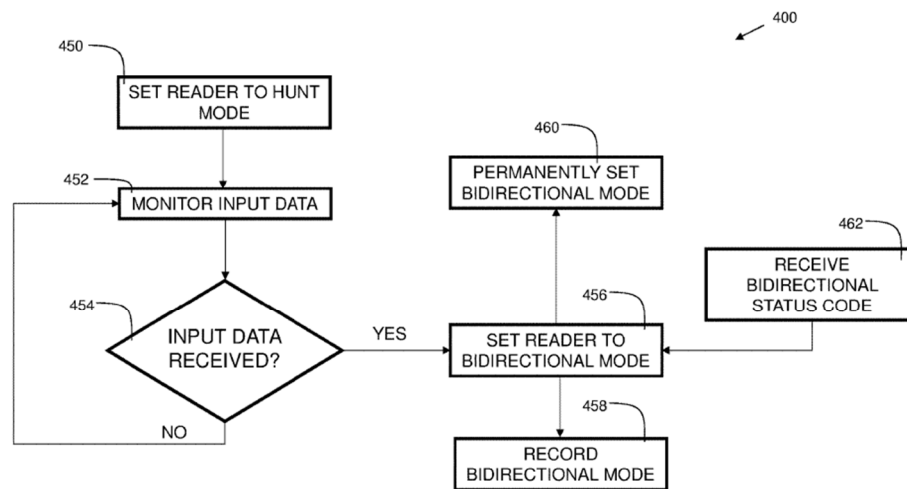


FIG. 4

EX-1001, Fig. 4. “If, at process step 454 input data is received, the process continues to process step 456 where the electronic credential reader is set to bidirectional communication mode.” *Id.*, 7:32-35. EX-1003, ¶248.

Like the '830 Patent, Chis discloses that “the default factory configuration

for the reader is set to be a Default Mode (path=RS485),” “which sets the path for RS485 (or OSDP mode).” EX-1005, 3:34-35, 2:55-56; EX-1013, ¶¶16, 19. “If the reader receives an OSDP (or other) message over RS485, then...the connection path remains the same as in the Default Mode, but the reader is now officially in an OSDP Mode of operation.” EX-1005, 2:56-63; EX-1013, ¶16. Thus, like the ’830 patent, when Chis is in default mode, “the bidirectional communication interface [monitors] for any input data.” EX-1001, 7:17-19. EX-1003, ¶249.

Therefore, Chis discloses “**initializing the electronic credential reader in a hunt mode** [e.g., default mode].” EX-1003, ¶¶247-250.

Limitation 15[B]

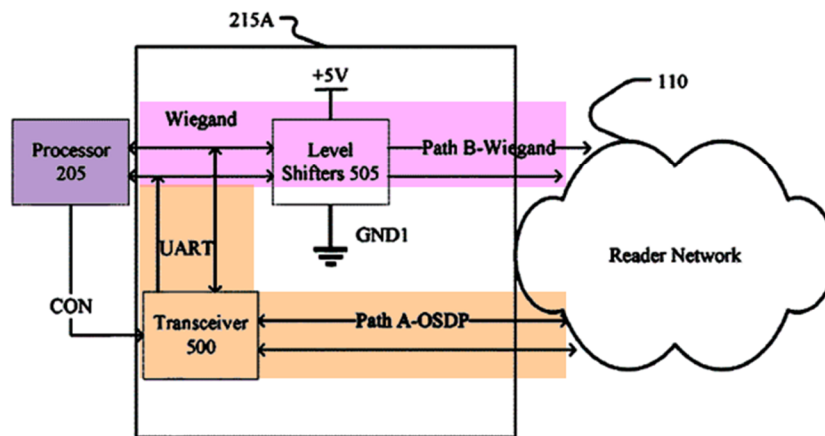
The claim requires “**transmitting received credential information via a unidirectional communication interface while in hunt mode,**” which is disclosed by Chis in view of Brennan. EX-1003, ¶¶251-256.

According to the ’830 Patent, “[i]n **hunt mode**, the switch 124 is configured such that the processor 102 is **listening for data on bidirectional communication interface 114.**” EX-1001, 4:63-65, 7:17-19.

Similar to the ’830 Patent’s “hunt mode,” Chis discloses a “**Default Mode**, which **sets the path for [bidirectional] RS485 (or OSDP mode).**” EX-1005,

2:55-56, 3:34-35; 4:2-3; EX-1013, ¶¶16, 19-20. As shown in Figure 5A,¹⁴ the reader listens for RS485 messages via the RS485/OSDP path/interface (orange). EX-1005, 11:9-15; EX-1013, ¶54.

Fig. 5A



EX-1005/EX-1013, Fig. 5A. EX-1003, ¶253.

Upon receiving a credential, Chis’s reader “will **switch to Wiegand Mode** (path=Wiegand),” “in which the communication protocol for the network 110 is in

¹⁴ Unlike the ’830 Patent’s other independent claims, claim 15 does not require a “switch” or “the bidirectional communication interface and the unidirectional communication interface [being] configured to share the plurality of external communication lines.” Likewise, Chis’s Figure 5A (with no switch) is relied upon for this Ground. EX-1003, ¶253.

accordance with Wiegand protocol and wiring standards.” EX-1005, 3:35-39, 9:6-8; EX-1013, ¶¶19, 43. In other words, Chis discloses a default mode where the reader listens to the RS485/OSDP interface for bidirectional messages but does not transmit the received credential information via the unidirectional/Wiegand interface (because, if it does so, the reader “will switch to Wiegand Mode” completely (EX-1005, 3:35-39; EX-1013, ¶¶19)). EX-1003, ¶254.

Brennan, however, discloses a device that listens for bidirectional messages while also transmitting data via a unidirectional interface. Brennan discloses that as meter interface units (MIUs) are “installed, the MIU will transmit a configuration packet with containing identification and initialization data from the MIU.” EX-1010, ¶25. “At this point, the MIU would **assume it is operating in the ‘one-way’ mode**. During installation the MIU initially will **listen to the collectors transmitting** on the channel in response to the configuration data packet.” *Id.* It would have been obvious to modify Chis’s default mode based on Brennan so that the reader, when in default mode, listens for bidirectional messages *and* also transmits data via the unidirectional interface. EX-1003, ¶255; motivation-to-combine Chis and Brennan following claim 15.

Therefore, Chis in view of Brennan discloses “**transmitting received credential information via a unidirectional communication interface** [*e.g.*, Chis’s Wiegand interface (pink)] **while in hunt mode** [*e.g.*, Chis’s default mode

modified by Brennan].” EX-1003, ¶¶251-256.

Limitation 15[C]

The claim requires “**monitoring a bidirectional communication interface for input data**,” which is disclosed by Chis, and by Chis in view of Brennan. EX-1003, ¶¶257-258.

As explained for Limitations 10[C] and 15[B], Chis discloses monitoring the bidirectional communication interface for input data, *e.g.*, OSDP/RS485 message, when in **default mode**. Thus, this limitation is satisfied by Chis alone. Moreover, as explained in the motivation-to-combine Chis and Brennan section, the simple modification to Chis’s reader would allow *both* “transmitting received credential information via a unidirectional communication interface” (Limitation 15[B]) *and* “monitoring a bidirectional communication interface for input data” (Limitation 15[C]) when in default mode. Therefore, Chis in view of Brennan also discloses Limitation 15[C]. EX-1003, ¶258.

Limitation 15[D]

Limitation 15[D] requires “**setting the electronic credential reader to a bidirectional mode upon detecting input data on the bidirectional communication interface**.” As explained for Limitation 10[B], Chis discloses

that, when in **default mode**, the reader switches to OSDP mode upon detecting an OSDP/RS485 message before receiving a credential. EX-1005, 3:39-42; EX-1013, ¶19. Similarly, Chis discloses “**setting the electronic credential reader to a bidirectional mode** [*e.g.*, OSDP mode] **upon detecting input data** [*e.g.*, OSDP/RS485 message] **on the bidirectional communication interface** [*e.g.*, OSDP/RS485 interface (orange)].” EX-1003, ¶¶259-260.

Limitation 15[E]

Limitation 15[E] is identical to Limitation 10[C] and is disclosed for the same reasons. EX-1003, ¶261.

Motivation to Combine Chis and Brennan

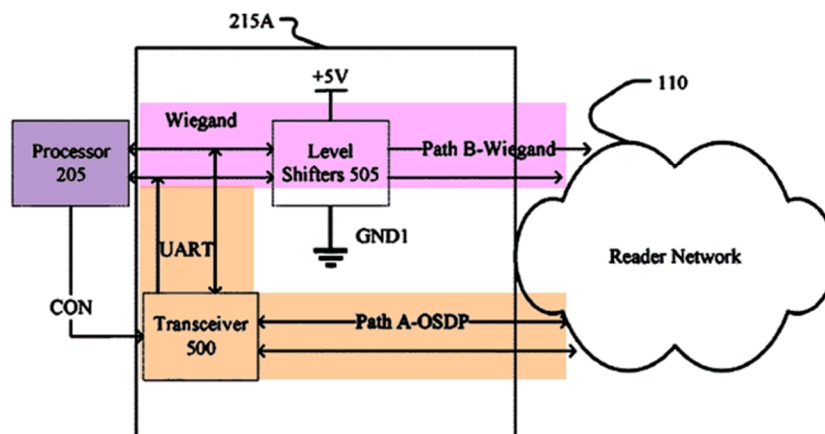
A POSITA would have found it obvious to combine Chis and Brennan. EX-1003, ¶¶262-267.

Chis and Brennan are **analogous art** to the ’830 Patent because they address a similar problem to the ’830 Patent, *e.g.*, device communication mode switching. Chis (like the ’830 Patent) is directed to communication mode/interface control between an upstream access controller and downstream credential readers. EX-1001, 1:13-15, Figs. 1, 3; EX-1005, 1:27-29, Fig. 1; EX-1013, ¶2, Fig. 1. Similarly, Brennan is directed to communication mode/interface control between

an upstream collector and a downstream MIU. EX-1010, Abstract, Fig. 1. Like Chis (and the '830 Patent), Brennan discloses that “[t]he network may operate in either a ‘one way’ mode or a ‘two way’ communication mode between the MIUs and collectors, or a combination of both.” *Id.*, ¶22. Also similarly, Brennan’s “MIU would...switch to the two-way mode of operation” if a bidirectional message, such as an acknowledgement signal is received. EX-1010, ¶26. EX-1003, ¶263.

As shown in Figure 5A below, Chis discloses that the reader may communicate with reader network 110 via either the Wiegand (unidirectional) interface (pink) or the RS485/OSDP (bidirectional) interface (orange). EX-1005, 11:7-24; EX-1013, ¶¶54-55.

Fig. 5A



EX-1005/EX-1013, Fig. 5A. Chis further discloses “a Default Mode, which sets

the path for RS485 (or OSDP mode).” EX-1005, 2:55-56; EX-1013, ¶16. “If the reader receives an OSDP (or other) message over RS485..., the connection path remains the same as in the Default Mode, but the reader is now officially in an OSDP Mode of operation.” EX-1005, 2:59-63; EX-1013, ¶16. “However, if...a credential is presented to the reader before an RS485 message is received,...the reader switches to a Wiegand Mode of operation.” EX-1005, 2:65-3:3; EX-1013, ¶16. Thus, when in default mode, Chis’s reader monitors the RS485/OSDP interface for bidirectional messages but does not transmit data via the Wiegand interface (because if doing so the reader would switch to Wiegand mode completely (EX-1005, 3:35-39; EX-1013, ¶19)). EX-1003, ¶264.

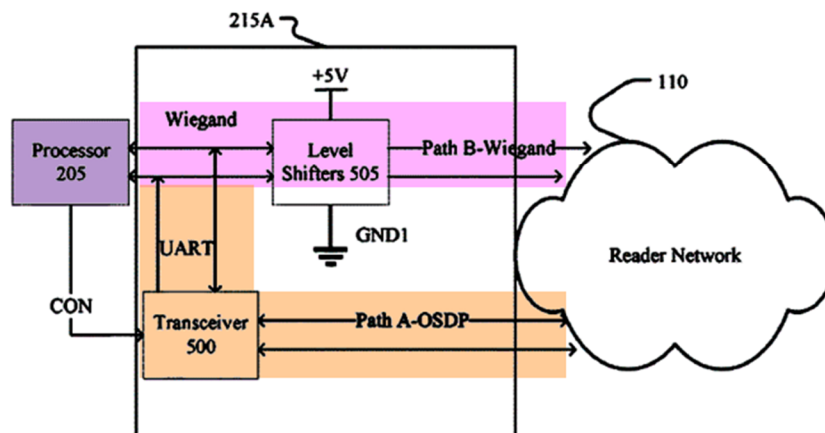
However, Brennan discloses the simple variation of listening for a bidirectional message while also transmitting data via the unidirectional interface. EX-1010, ¶25 (“As MIUs are installed..., the MIU would **assume it is operating in the ‘one-way’ mode**. During installation the MIU initially **will listen to the collectors** transmitting on the channel in response to the configuration data packet.”). EX-1003, ¶265.

A POSITA would have been **motivated** to modify Chis’s default mode based on Brennan such that when in default mode, Chis’s reader can monitor the RS485/OSDP interface for bidirectional messages *and* at the same time transmit data via the Wiegand interface until a bidirectional message is received and the

reader changes to bidirectional mode. According to Chis (and as recognized by the '830 Patent), communications via the RS485/OSDP interface are more secure and therefore provide advantages over the legacy Wiegand interface. *See* EX-1005, 1:64-2:3; EX-1013, ¶12; EX-1001, 6:1-4. A POSITA implementing Chis's reader would have been **motivated to maximize the reader's ability to switch to RS485/OSDP mode whenever appropriate**. Therefore, instead of switching to the Wiegand mode permanently upon receiving a credential, a POSITA would have been motivated to modify Chis's default mode based on Brennan such that the reader can transmit the received credential information on the unidirectional interface while also listening/monitoring for bidirectional messages. This way, the Chis-Brennan reader could continue "hunting" for bidirectional messages and be **ready to switch to OSDP mode** upon receiving a bidirectional message. EX-1005, 3:49-58; Ex-1013, ¶19. In addition, a POSITA would have been motivated to minimize unnecessarily switching between different modes to improve operation reliability of the reader. EX-1003, ¶266.

A POSITA would have had a **reasonable expectation of success** in incorporating into Chis's reader Brennan's concept of transmitting data via the unidirectional interface while also listening for bidirectional messages. In both references, the device can communicate via both a unidirectional interface and a bidirectional interface. EX-1005, 3:4-7; EX-1013, ¶17; EX-1010, ¶22. In both

references, the device switches to bidirectional mode upon receiving a bidirectional message. EX-1005, 2:59-65; EX-1013, ¶16; EX-1010, ¶26. Because the Wiegand interface (pink) and the RS485/OSDP interface (orange) do not share any external communication path, Chis's reader is capable of transmitting data via the Wiegand interface (pink) while listening/monitoring bidirectional messages on the RS485/OSDP (orange), without hardware modification.

Fig. 5A

EX-1005/EX-1013, Fig. 5A. Therefore, a POSITA would have found it obvious to incorporate into Chis's reader Brennan's concept of transmitting data via unidirectional interface while also listening/monitoring for bidirectional messages. A POSITA would have known this modification would result in a working system. EX-1003, ¶267.

E. GROUND #5: Claims 16-17 are rendered obvious by Chis, Brennan, and Guthery

1. Claim 16

The claim requires “[t]he method of claim 15, further comprising **reverting to the hunt mode upon detection of a reset message on the bidirectional communication interface,**” which is rendered obvious by Guthery as applied to the Chis-Brennan reader. EX-1003, ¶¶269-271.

As explained above, Chis discloses switching from default mode to Wiegand mode and from default mode to OSDP/bidirectional mode. EX-1005, 3:33-42; EX-1013, ¶19. Although Chis does not disclose changing the reader’s communication mode upon detection of a reset message on the OSDP/RS485 interface, this is disclosed by Guthery. Guthery discloses that “[t]he change back [to Wiegand mode]...is accomplished [] by sending a message in packet-mode to terminate packet-mode communication.” EX-1006, 18:41-45. Although Guthery’s bidirectional message is used to switch the reader from bidirectional mode to Wiegand mode, a POSITA would have found it obvious to use the same method to switch Chis’s reader from bidirectional mode back to default mode, *e.g.*, the simple concept of using a message to reset a reader to its default communication mode as taught by Guthery. In the context of claim 16, which depends from claim 15, Chis’s reader is assumed to be in bidirectional mode, and therefore, it is able to

receive messages from an upstream device over the OSDP/RS485 interface.

Therefore, it would have been obvious for a POSITA to configure the reader's communication mode through such OSDP/RS485 messages, including switching from OSDP mode to default mode. *See* motivation-to-combine Chis and Guthery. Similarly, a POSITA would have found it obvious in view of Guthery to configure Chis's reader to switch from Chis's OSDP mode to Chis's default mode as modified by Brennan. EX-1003, ¶270.

Therefore, Guthery as applied to the Chis-Brennan reader renders obvious “[t]he method of claim 15, further comprising reverting to the hunt mode [e.g., Chis's default mode as modified by Brennan] **upon detection of a reset message** [e.g., Chis's OSDP/RS485 message as taught by Guthery] **on the bidirectional communication interface** [e.g., Chis's OSDP/RS485 interface (orange)].” EX-1003, ¶¶269-271.

2. Claim 17

The claim requires “[t]he method of claim 15, further comprising **reverting to the hunt mode upon detection of a status code from a credential**,” which is rendered obvious by Guthery as applied to the Chis-Brennan reader. EX-1003, ¶¶272-275.

As explained for Limitations 12[I(1)-(2)], Guthery discloses setting a

reader's communication mode using a special credential that provides a "bidirectional status code." EX-1006, 12:55-59; EX-1001, 7:4-6; EX-1003, ¶273.

Chis discloses three communication modes: "Default Mode, OSDP Mode, and Wiegand Mode." EX-1005, 3:5-7; EX-1013, ¶17. In any of the three modes, the reader can receive information from a credential. *See* EX-1005, 3:34-39, 4:60-64, 1:23-27; EX-1013, ¶¶2, 19, 24. A POSITA would have understood that Guthery's credential-initiated mode change can be used to easily switch the Chis-Brennan reader between default, OSDP, and Wiegand modes, including switching from OSDP to default mode. As explained for Limitation 12[I(1)], a POSITA would have found Guthery's credential-initiated mode configuration advantageous and well within the skill of a POSITA to implement in Chis's reader. For the reasons explained in the motivation-to-combine Chis and Guthery, a POSITA would have found it obvious to modify the Chis-Brennan reader with Guthery's credential-initiated communication mode change. EX-1003, ¶274.

Therefore, Guthery as applied to the Chis-Brennan reader renders obvious **"[t]he method of claim 15, further comprising reverting to the hunt mode [e.g., Chis's default mode modified by Brennan] upon detection of a status code [e.g., data (as taught by Guthery) associated with hunt mode] from a credential."** EX-1003, ¶¶272-275.

F. **GROUND #6: Claims 18-19 are rendered obvious by Chis, Brennan, and Adams**

1. **Claim 18**

The claim requires “[t]he method of claim 15, further comprising **permanently disconnecting the unidirectional communication interface upon setting the electronic credential reader to the bidirectional mode,**” which is disclosed by Adams as applied to the Chis-Brennan reader. EX-1003, ¶¶277-278.

As explained for Limitation 11[H], Chis in view of Adams discloses severing, or blowing, the OTP fuse to permanently disable/disconnect the Wiegand interface **after the reader is set to OSDP mode**. Although Limitation 11[H] is explained with respect to Chis’s Figure 5B, a POSITA would have understood that Adams’s OTP fuse may likewise be implemented in Chis’s Figure 5A configuration in the same way (*i.e.*, the fuse enabling permanent disconnection of the Wiegand/unidirectional path). For the reasons explained in the motivation-to-combine Chis and Adams, a POSITA would have found it obvious to combine the Chis-Brennan reader with Adams’s OTP fuse. *See* motivation-to-combine Chis and Adams. Therefore, Chis-Brennan and Adams disclose this claim. EX-1003, ¶278.

2. Claim 19

The claim requires “[t]he method of claim 18, wherein **permanently disconnecting the unidirectional communication interface comprises blowing a one-time programmable fuse,**” which is disclosed by Adams as applied to the Chis-Brennan reader for the reasons explained for claim 18. EX-1003, ¶279.

G. GROUND #7: Claim 20 is rendered obvious by Chis, Brennan, and Panian

1. Claim 20

The claim requires “[t]he method of claim 15, further comprising **reverting to the hunt mode upon expiry of a hysteresis timer.**” This additional limitation is substantially identical to Limitation 13[I(7)]. Although Limitation 13[I(7)] is explained with respect to Chis Figure 5B, a POSITA would have understood that Panian’s timer may be implemented in Chis Figure 5A configuration in the same way. For the reasons explained in the motivation-to-combine Chis and Panian, a POSITA would have found it obvious to modify the Chis-Brennan reader with Panian’s timer. *See* motivation-to-combine Chis and Panian. Therefore, Panian as applied to the Chis-Brennan reader discloses claim 20. EX-1003, ¶281.

VIII. CONCLUSION

Trial should be instituted, and the Challenged Claims should be cancelled as unpatentable.

Dated: October 17, 2022

Respectfully Submitted,

/ Dion M. Bregman /
Dion Bregman (Reg. No. 45,645)

U.S. PATENT NO. 10,467,830 – Claim Listing

No.	Claim Elements
1[P]	An electronic credential reader, comprising:
1[A]	a credential receiver;
1[B]	a unidirectional communication interface;
1[C]	a bidirectional communication interface;
1[D]	a plurality of external communication lines, wherein the unidirectional communication interface and the bidirectional interface are coupled to a processor via the external communication lines; and
1[E]	a computer readable medium coupled to the processor;
1[F]	wherein the bidirectional communication interface and the unidirectional communication interface are configured to share the plurality of external communication lines; and
1[G]	wherein the computer readable medium comprises instructions that, when executed by the processor, change from a first communication mode in which the electronic credential reader uses the unidirectional communication interface to communicate with the processor via the external communication lines to a second communication mode in which the electronic credential reader uses the bidirectional communication interface to communicate with the processor via the external communication lines.
Claim 2	The electronic credential reader of claim 1, wherein the bidirectional communication interface comprises an RS-485 interface.
3[P]	An electronic credential reader, comprising:
3[A]	a credential receiver;
3[B]	a unidirectional communication interface;
3[C]	a bidirectional communication interface;
3[D]	a plurality of external communication lines;
3[E]	a switch configured to selectively couple the unidirectional communication interface and the bidirectional communication interface to the plurality of external communication lines;
3[F]	a processor coupled via the plurality of external communication lines to the switch, for the processor to communicate with the unidirectional communication interface and bidirectional communication interface through both the plurality of external communication lines and the switch; and

3[G]	a computer readable medium coupled to the processor;
3[H]	wherein the bidirectional communication interface and the unidirectional communication interface are configured to share the plurality of external communication lines; and
3[I]	wherein the computer readable medium comprises instructions that, when executed by the processor, control the switch to change from a first communication mode in which the electronic credential reader uses the unidirectional communication interface to communicate with the processor via the external communication lines to a second communication mode in which the credential reader uses the bidirectional communication interface to communicate with the processor via the external communication lines.
Claim 4	The electronic credential reader of claim 3, wherein the unidirectional communication interface comprises an output interface.
Claim 5	The electronic credential reader of claim 3, wherein the bidirectional communication interface comprises an RS-485 interface.
Claim 6	The electronic credential reader of claim 3, wherein the plurality of external communication lines comprises two communication lines.
Claim 7	The electronic credential reader of claim 6, wherein the two communication lines comprises a DATA0 line and a DATA1 line.
Claim 8	The electronic credential reader of claim 7, wherein the two communication lines further comprise a RS-485 DATA (A) line and a RS-485 DATA (B) line.
Claim 9	The electronic credential reader of claim 8, wherein the two communication lines are configured and disposed to implement an Open Supervised Device Protocol (OSDP) interface.
10[P]	The electronic credential reader of claim 3, wherein the computer readable medium further contains instructions, that when executed by the processor, perform the steps of:
10[A]	monitoring the bidirectional communication interface for input data;
10[B]	setting the electronic credential reader to a bidirectional mode upon detecting input data; and
10[C]	recording a status of the bidirectional mode in a non-volatile storage.
11[P]	An electronic credential reader, comprising:
11[A]	a credential receiver;
11[B]	a unidirectional communication interface;
11[C]	a bidirectional communication interface;

11[D]	a plurality of external communication lines, wherein the bidirectional communication interface and the unidirectional communication interface are configured to share the plurality of external communication lines;
11[E]	a switch coupled to the unidirectional communication interface, the bidirectional communication interface, and the plurality of external communication lines;
11[F]	a processor coupled to the switch;
11[G]	a computer readable medium coupled to the processor; and
11[H]	a one-time programmable fuse disposed between the unidirectional communication interface and the processor;
11[I(P)]	wherein the computer readable medium contains instructions that, when executed by the processor, perform the steps of:
11[I(1)]	monitoring the bidirectional communication interface for input data;
11[I(2)]	severing the one-time programmable fuse upon detection of input data; and
11[I(3)]	changing a communication mode of the electronic credential reader from a unidirectional mode to a bidirectional mode.
12[P]	An electronic credential reader, comprising:
12[A]	a credential receiver;
12[B]	a unidirectional communication interface;
12[C]	a bidirectional communication interface;
12[D]	a plurality of external communication lines;
12[E]	a switch coupled to the unidirectional communication interface, the bidirectional communication interface, and the plurality of external communication lines;
12[F]	a processor coupled to the switch;
12[G]	a computer readable medium coupled to the processor; and
12[H]	wherein the bidirectional communication interface and the unidirectional communication interface are configured to share the plurality of external communication lines; and
12[I(P)]	wherein the computer readable medium contains instructions, that when executed by the processor, perform the steps of:
12[I(1)]	monitoring the credential receiver for a bidirectional status code;
12[I(2)]	changing a communication mode of the electronic credential reader from a unidirectional mode to a bidirectional mode by setting the electronic credential reader to the bidirectional mode upon detecting the bidirectional status code; and

12[I(3)]	recording the bidirectional mode in a non-volatile storage.
13[P]	An electronic credential reader, comprising:
13[A]	a credential receiver;
13[B]	a unidirectional communication interface;
13[C]	a bidirectional communication interface;
13[D]	a plurality of external communication lines;
13[E]	a switch coupled to the unidirectional communication interface, the bidirectional communication interface, and the plurality of external communication lines;
13[F]	a processor coupled to the switch;
13[G]	a computer readable medium coupled to the processor;
13[H]	wherein the bidirectional communication interface and the unidirectional communication interface are configured to share the plurality of external communication lines, and;
13[I(P)]	wherein the computer readable medium comprises instructions, that when executed by the processor, perform the steps of:
13[I(1)]	changing a communication mode of the electronic credential reader from a unidirectional mode to a bidirectional mode;
13[I(2)]	monitoring the bidirectional communication interface for input data;
13[I(3)]	setting the electronic credential reader to a bidirectional mode upon detecting input data;
13[I(4)]	recording a status of the bidirectional mode in a non-volatile storage;
13[I(5)]	establishing a hysteresis timer;
13[I(6)]	resetting the hysteresis timer upon reception of a bidirectional message; and
13[I(7)]	reverting the electronic credential reader to a hunt mode upon expiry of the hysteresis timer.
14[P]	A computer-implemented method for configuring an electronic credential reader, comprising:
14[A]	initializing the electronic credential reader in a unidirectional communication mode;
14[B]	transmitting received credential information from the electronic credential reader to a processor via a unidirectional communication interface while in the unidirectional communication mode;
14[C]	monitoring a bidirectional communication interface for input data; and
14[D]	setting the electronic credential reader, upon detecting input data on the bidirectional communication interface, from the unidirectional

	communication mode to a bidirectional communication mode in which any further received credential information is transmitted from the electronic credential reader to the processor via a bidirectional communication interface.
15[P]	A computer-implemented method for configuring an electronic credential reader, comprising:
15[A]	initializing the electronic credential reader in a hunt mode;
15[B]	transmitting received credential information via a unidirectional communication interface while in hunt mode;
15[C]	monitoring a bidirectional communication interface for input data; and
15[D]	setting the electronic credential reader to a bidirectional mode upon detecting input data on the bidirectional communication interface; and
15[E]	recording a bidirectional mode status in a non-volatile storage.
Claim 16	The method of claim 15, further comprising reverting to the hunt mode upon detection of a reset message on the bidirectional communication interface.
Claim 17	The method of claim 15, further comprising reverting to the hunt mode upon detection of a status code from a credential.
Claim 18	The method of claim 15, further comprising permanently disconnecting the unidirectional communication interface upon setting the electronic credential reader to the bidirectional mode.
Claim 19	The method of claim 18, wherein permanently disconnecting the unidirectional communication interface comprises blowing a one-time programmable fuse.
Claim 20	The method of claim 15, further comprising reverting to the hunt mode upon expiry of a hysteresis timer.

CERTIFICATION OF COMPLIANCE WITH TYPE-VOLUME LIMITS

This Petition includes 13,984 words as counted by Microsoft Word and is therefore in compliance with the 14,000-word limit established by 37 C.F.R.

42.24(a)(1)(i). Accordingly, pursuant to 37 C.F.R. 42.24(d), lead counsel for the Petitioners hereby certify that this petition complies with the type-volume limits established for a petition requesting IPR.

Dated: October 17, 2022

Respectfully Submitted,

/ Dion M. Bregman /
Dion Bregman (Reg. No. 45,645)

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. 42.6(4) and 42.105, lead counsel for Petitioners hereby certifies that on October 17, 2022, copies of this Petition and all supporting exhibits were sent via Priority Mail Express to the correspondence address of record for the '830 patent:

Howard M. Cohn & Associates, LLC
50 Public Square,
Suite 2200
Cleveland, Ohio 44113

A courtesy copy of this Petition and supporting exhibits was also served via email on October 17, 2022 on WaveLynx's counsel of record in *HID Global Corporation, et al. v. WaveLynx Technologies Corporation*, No. 1-22-cv-00362 (D. Del.):

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