UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SOLAREDGE TECHNOLOGIES, INC., Petitioner

v.

FRONIUS INTERNATIONAL GMBH, Patent Owner

U.S. Patent No. 9,137,919 Filing Date: May 31, 2011 Issue Date: September 15, 2015 Title: Inverter

Inter Partes Review No.: IPR2022-00849

PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,137,919 UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. §§ 42.1-100, ET SEQ.

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EXHIBIT	LIST
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Exhibit No.	Description
1001	U.S. Patent No. 9,137,919 (" 919 patent ") downloaded from http://patft.uspto.gov/netahtml/PTO/patimg.htm
1002	Image file wrapper for U.S. Patent App. No. 13/643,111 downloaded from https://portal.uspto.gov/pair/PublicPair
1003	Declaration of R. Jacob Baker, Ph.D.
1004	Certified translation of German patent No. DE 91 05 122 U1 (" Siemens "), which is attached as Attachment A to Ex. 1007
1005	U.S. Patent No. 5,478,259 (" Noschese ") downloaded from http://patft.uspto.gov/netahtml/PTO/patimg.htm
1006	U.S. Patent No. 7,035,115 (" Walesa ") downloaded from http://patft.uspto.gov/netahtml/PTO/patimg.htm
1007	Translator Certification by Michael L. Magee of Morningside Translations dated February 4, 2021 for German patent No. DE91 05 122 U1, Attachment A of which is Ex. 1004, Attachment B is the German language version of DE 91 05 122 U1.

SolarEdge Technologies, Inc. ("SolarEdge" or "Petitioner") hereby petitions for *inter partes* review of claims 1-7 of U.S. Patent No. 9,137,919 (Ex. 1001, the "919 patent"). The 919 patent relates to an assembly whereby an upper housing part is detached from a lower housing part using a "rotate-and-lift" feature. Ex. 1001, 7:20-27, Ex. 1002, 251-252. As established below, this feature existed almost two decades earlier and the claims of the 919 patent would have been obvious to one of ordinary skill in the art at the time of the 919 patent's alleged invention.

I. STATEMENT OF PRECISE RELIEF REQUESTED

A. Prior Art

The following references are pertinent to the grounds of unpatentability under pre-AIA United States Code Title 35:

- DE 91 05 122 U1 ("Siemens," Ex. 1004 is the Certified English translation attached as Attachment A to Ex. 1007, "Translator Certification" by translator Michael L. Magee). Siemens issued on August 8, 1991, published on September 19, 1991, and is 35 U.S.C. § 102(b) prior art to the 919 patent.
- U.S. Patent No. 5,478,259 ("Noschese," Ex. 1005). Noschese issued on December 26, 1995, and is 35 U.S.C. § 102(b) prior art to the 919 patent.

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• U.S. Patent No. 7,035,115 ("Walesa," Ex. 1006). Walesa issued on April 25, 2006, and is 35 U.S.C. § 102(b) prior art to the 919 patent.

B. Grounds

This Petition, supported by the declaration of R. Jacob Baker, Ph.D. ("Baker Declaration") (Ex. 1003), requests cancellation of claims 1-7 of the 919 patent (the "Challenged Claims") on the following grounds under pre-AIA United States Code Title 35:

- **Ground 1**: Claims 1-2 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Siemens;
- Ground 2: Claims 3-7 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Siemens in view of Noschese;
- **Ground 3**: Claims 1-2 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Walesa; and,
- Ground 4: Claims 3-7 are unpatentable under 35 U.S.C. § 103(a) as being obvious over Walesa in view of Noschese.

II. OVERVIEW OF THE 919 PATENT

A. Summary of the 919 patent

The 919 patent is directed to an apparatus having an upper housing part 33 and a lower housing part 34. Ex. 1001, 3:59-63; Ex. 1003, ¶31-37. "In [the] closed or mounted state, i.e. in the operating position according to FIG. 2, the upper and

the lower housing part 33, 34 are connected to one another and formed such that their protrusions, edges, etc. engage each other and shut watertight or dust-tight according to the construction of the device (IP class)." *Id.*, 3:66-4:4; FIG. 2:



"The upper housing part 33 is hooked to or supported by the lower housing part 34 via a rotating element 35." Ex. 1001, 4:4-5. In the illustrated embodiment, the upper housing part 33 includes "a slotted guide track 36, i.e. in the region of the rotating element 35" that receives the rotating element 35 on the upper housing part 33. *Id.*, 5:7-15.

To mount the upper housing part 33 onto the lower housing part 34, an installer first seats the rotating element 35 into the slotted guide track 36 and then rotates the upper housing part 33 onto the lower housing part 34 to connect electrical components in each of the parts 33, 34. *Id.*, 4:52-64. This is referred to herein as a "seat-and-rotate" operation.

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To detach the upper housing part 33 from the lower housing part 34, "the upper housing part 33 must be rotated or lifted in relation to the lower housing part 34 by a pivoting movement in the direction of arrow 57," which disengages the elements of the housing parts 33, 34. *Id.*, 4:33-44; FIG. 3. At this point, the two housing parts 33, 34 are held together by the rotating element 35 and the slotted guide track 36. *Id.* For complete detachment, the upper housing part 33 may be pushed upwards and pulled from the lower housing part 34. *Id.*, 44-51. This is referred to herein as a "rotate-and-lift" operation.

Figure 3 of the 919 patent, reproduced below, illustrates the apparatus in the opened state:



B. Prosecution History

The 919 patent was filed in the USPTO on October 24, 2012, as a National stage filing of PCT Application No.: PCT/AT2011/000248. Ex. 1002, 1-3. The 919 IPR2022-00849 4 Paper 1 - Petition

patent claims priority through the PCT application to foreign application

No. AT A 935/2010, filed on June 8, 2010. *Id.*, 13.¹

The 919 patent includes only one independent claim – claim 1 which recites:

- [1.pre] 1. An inverter comprising
- [1.a] an upper and a lower housing part,
- [1.b] wherein electronic components are arranged in the upper and lower housing parts,
- [1.c] said components being electrically connected to one another in a releasable manner by means of a contactmaking system formed from two parts,
- [1.d] wherein the upper housing part is connected to the lower housing part in a manually detachable manner by means of a rotating element <u>arranged on one of</u> <u>the upper housing part or the lower housing part</u> <u>and a slotted guide track arranged on another of</u> <u>the upper housing part or the lower housing part,</u> <u>such that the upper housing part is detached from</u>

¹ Because the prior art relied upon in this petition issued years before 2010, Petitioner is not challenging whether the 919 patent is entitled to the June 8, 2010 priority date or any priority date before the October 24, 2012 filing in the USPTO, but reserves the right to do so in litigation or in any other proceeding, including a subsequent IPR.

<u>the lower housing part by a pivoting movement</u> <u>followed by a linear movement</u>,

[1.e] wherein the rotating element forms an axis of rotation for a circle arc, and

[1.f] wherein in the upper and lower housing parts, parts of the contact-making system are arranged, respectively, along this circle arc in such a way that these parts, during the pivoting movement of the upper housing part relative to the lower housing part into an operating position, can be automatically electrically connected, with the housing parts connected.

Ex. 1001, 7:16-8:3 (claim 1) (emphasis added).² In response to an Office Action,

claim 1 was amended to recite the elements emphasized above. Ex. 1002, 242-243 ("Amendment in Response to First Office Action," dated June 2, 2015 (*e.g.*, at 6-7 [amending pending claim 1])). The Applicant argued that "the detachment of the upper housing part from the lower housing part is always done such that first a pivoting (rotating) movement is carried out and then a linear (lifting) movement is carried out" and that these features distinguished the claimed invention from the cited prior art. *Id.*, 251, 252.

² Unless otherwise noted, all bold, underlined emphasis is added.

Petitioner respectfully submits that the 919 patent should not have issued because the alleged novelty of the 919 patent – the rotate-and-lift feature – was well known almost two decades earlier as evidenced, *e.g.*, by Siemens.

C. Person of Ordinary Skill in the Art

A person of ordinary skill in the art at the time of the alleged invention of the 919 patent (a "POSITA") would have had a Bachelors' degree in engineering or a comparable field of study, plus approximately two to three years of professional experience with electrical/mechanical systems including power systems, or other relevant industry experience. Additional graduate education could substitute for professional experience, and significant experience in the field could substitute for formal education. Ex. 1003, ¶38.

D. Claim Construction Under 37 C.F.R. § 42.104(b)(3)

The Challenged Claims are interpreted using the same claim construction standard that is used to construe the claim in a civil action in federal district court. 37 C.F.R. § 42.100(b).

At this point, Petitioner contends that no terms need be construed for the grounds in this petition because Petitioner does not apply any meaning other than the ordinary and customary meaning of each challenged claim 1-7 as understood by one of ordinary skill in the art and the specification and prosecution history pertaining to the patent. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-14 (Fed. Cir.

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2005) (en banc); *see also*, *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) (providing that only those terms that are in controversy need be construed, and only to the extent necessary to resolve the controversy); Ex. 1003, ¶39.

III. GROUND 1: SIEMENS RENDERS OBVIOUS CLAIMS 1-2

A. Siemens Overview

Siemens discloses a system for mounting (seat-and-rotate) an assembly 1 (e.g., a power converter or other power electronics device) on an assembly carrier 4 (e.g., a rack assembly) and dismounting (rotate-and-lift) the assembly 1 from the assembly carrier 4. Ex. 1004, FIG. 2, 1:5-12, 1:19-22, 2:25-3:15; Ex. 1003, ¶¶40-42. To mount the assembly 1, an installer performs a two-step process that seats assembly 1's suspensions 2 in assembly carrier 4's housing suspensions 3. Ex. 1004, FIG. 2, 1:5-12, 2:25-3:1. The installer then rotates the assembly 1 so that its plug connector 5 engages and electrically connects with the assembly carrier 4's socket connector 6. Ex. 1004, FIG. 2, 1:5-12, 3:1-12. A centering pin 7 engages a centering bore to help ensure a proper connection. Ex. 1004, FIG. 2 and 3:7-12. Annotated Siemens figure 2 (below) illustrates mounting assembly 1 on the assembly carrier 4 by seating it in and down (via suspension 2 and housing suspension 3) and then rotating it:

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To dismount the assembly 1 from the carrier 4, the installer simply reverses the order of the two mounting steps and rotates the assembly 1 to disengage and disconnect the plug connector 5 from the socket connector 6 before lifting the suspension 2 out from the housing suspension 3. Ex. 1004, FIG. 2, 1:5-12, 1:19-22, 2:25-3:15, 5:3-19. Annotated Siemens figure 2 (below) illustrates dismounting assembly 1 from carrier 4 by rotating it and then lifting it up and out:



Seat-and-rotate/rotate-and-lift is not even the inventive concept of Siemens, which characterizes those steps as prior art. Ex. 1004, 2:22-26. Siemens's invention is a floating bearing that minimizes the weight on the plug connectors in the prior art seat-and-rotate/rotate-and-lift system. Ex. 1004, FIG. 1, 1:19-22, 3:17-4:15. Accordingly, seat-and-rotate/rotate-and-lift was well-known even before April 25, 1991, when Siemens was filed.

B. Claim 1

1. [1.pre] 1. An inverter comprising

The annotated figures below illustrate how the petition asserts Siemens's elements generally correspond to the 919 patent's elements (same color indicates correspondence):



The Federal Circuit has held that "as a general rule preamble language is not treated as limiting." *Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d

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1335, 1347 (Fed. Cir. 2012). A preamble is only limiting "if it recites essential structure or steps, or if it is 'necessary to give life, meaning, and vitality' to the claim." *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002). The claimed "inverter" recited in the preamble does not recite essential structure nor is it necessary to give life, meaning, and vitality to the claim. Not one claim limitation requires an inverting function or specific electrical circuitry needed in an inverter. Ex. 1003, ¶43-44. Instead, the body of claim 1 describes a "structurally complete" invention with no relation to the preamble. *Id*. As such, the preamble is not limiting. *Catalina*, 289 F.3d at 808.

Should the Patent Owner argue that the preamble is limiting, Siemens renders it obvious. Siemens discloses a method for mounting power converters and other power electronics devices on a rack assembly. Ex. 1004, Figs. 1-2, 1:5-12, 1:19-22, 2:25-3:15, 3:18-4:15, 5:3-19. Although Siemens expressly discloses "power converters" (which convert alternating current to direct current), Siemens teaches that the seat-and-rotate system is suitable for "devices of the power electronics system," generally, and it would have been obvious to a POSITA to implement a seat-and-rotate system for power inverters (which convert direct current to alternating current). Ex. 1003, ¶45. For example, Siemens expressly teaches that "high-current contacts" like those in inverters are also possible, "but are not illustrated for the sake of clarity." Ex. 1004, 3:4-5.

2. [1.a] an upper and a lower housing part,

Siemens's assembly 1 is an "upper housing part," and Siemens's assembly carrier 4 is a "lower housing part." Ex. 1003, ¶¶46-52. Siemens's figure 2 illustrates these parts:



Siemens's assembly 1 and assembly carrier 4 operate in the same manner that the claimed upper and lower housing parts operate in all of the disclosed embodiments of the 919 patent. Ex. 1004, Fig. 1, Abstract, 1:5-12, 2:25-3:15; Ex. 1001, Figs. 2-3, 5:49-6:21; Ex. 1003, ¶47.

For example, Siemens's assembly 1 rotates to mount on top of assembly carrier 4 in the same manner that the claimed "upper housing part" rotates to mount on top of the "lower housing part." Ex. 1004, FIG. 2, 1:5-12, 2:25-3:15; Ex. 1001, Abstract, Figs. 2-3, 1:24-27, 1:31-45, 2:13-22, 4:33-5:14, 5:24-27, 5:62-65, 6:32-58. The 919 patent repeatedly characterizes the upper housing part rotating to mount "on top" of or "onto" the lower housing part:

Attaching or placing the upper housing part 33 to or **onto** the lower housing part 34 is done in reverse order. First, the upper housing part 33 is positioned above the lower housing part 34 in a slightly inclined way in relation to the lower housing part 34, so the opening 39 of the slotted guide track 36 and the rotating element 35 are aligned with each other. In this way, **the upper housing part 33 may now be pushed onto the lower housing part 34**, so the rotating element 35 is inserted into the slotted guide track 36 via the opening 39. By performing a vertical displacement, the rotating element 35 is positioned in such a way that **the upper housing part 33 is placed on top of the lower housing part 34** via a pivoting movement.

Ex. 1001, 4:53-64 (emphasis added); *see also* 1:24-27 ("Typically, inverters are formed such that a lower device part or a holder ... is mounted and then <u>the upper</u>
<u>housing part</u> is screwed or <u>pushed on top of this lower part</u>.") Siemens's

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assembly 1 rotates to mount on top of or onto assembly carrier 4 in the same way. Ex.1004, FIG. 2, 1:5-12, 2:25-3:15. For that reason, alone, a POSITA would have understood Siemens's assembly 1 and assembly carrier 4 are the claimed "upper housing part" and "lower housing part," respectively. Ex. 1003, ¶48.

There are other relevant examples of how Siemens's assembly 1 and assembly carrier 4 respectively operate in the same manner as the claimed "upper housing part" and "lower housing part." Siemens's assembly 1 and assembly carrier 4 are mounted vertically just like the 919 patent's lower and upper housing parts in the preferred embodiment:

> The <u>inverter 1 is preferably attached to a wall in a</u> <u>vertical position</u>, wherein the rotating element 35 is arranged in the upper region of the inverter 1 in a substantially horizontal manner. Thus, in an <u>inverter 1</u> <u>mounted in such a vertical way</u>, the rotating element 35 rests on the slotted guide track 36 when the upper housing part 33 is hooked on.

Ex. 1001, 4:23-28; *see also*, Figs. 2-3, 4:33-5:14, 5:24-27, 5:62-65, 6:32-58; Ex. 1004, Fig. 2, 1:5-12, 2:25-3:15; Ex. 1003, ¶49.

As discussed below for other limitations of claim 1, Siemens's assembly 1 houses a plug connector 5 and the assembly carrier 4 houses a socket connector 6 in the same way that the 919 patent's upper housing part 33 houses a contact tab 52 and its lower housing part 34 houses a contact element 47. Ex. 1004, FIG. 2, 1:5-

12, 2:25-3:15; Ex. 1001, Figs. 2-3, 5:49-7:2. Siemens's connectors 5 and 6 are housed such that when the assembly 1 is mounted on top of assembly carrier 4, plug connector 5 and socket connector 6 are electrically connected in the same way that the 919 patent's contact element 47 and contact tab 52 are electrically connected when the upper housing part 33 is mounted on top of the lower housing part 34. Ex. 1004, FIG. 2, 1:5-12, 2:25-3:15; Ex. 1001, Abstract, Figs. 2-3, 1:24-27, 1:31-45, 2:13-22, 4:33-5:14, 5:24-27, 5:30-7:2; Ex. 1003, ¶50.

Siemens's assembly carrier 4 supports the weight of the assembly 1 in the same way that the 919 patent's lower housing part 34 supports the upper housing part 33. Ex. 1004, 1:5-12, 2:25-3:15; Ex. 1001, 4:4-5 ("[t]he <u>upper housing part</u> 33 is hooked to or <u>supported by the lower housing part 34</u> via a rotating element 35."), 4:26-28; Ex. 1003, ¶51.

For at least the reasons above, a POSITA would have understood Siemens discloses the claimed "upper housing part" (assembly 1) and "lower housing part" (assembly carrier 4). Ex. 1003, ¶52.

3. [1.b] wherein electronic components are arranged in the upper and lower housing parts,

Siemens's plug connector 5 is the claimed electronic component arranged in the upper housing part (*i.e.*, assembly 1), and its socket connector 6 is the claimed electronic component arranged in the lower housing part (*i.e.*, assembly carrier 4). Ex. 1003, ¶¶53-55.

As discussed above, when Siemens's assembly 1 is mounted on top of the assembly carrier 4, socket connector 6 and plug connector 5 are electrically connected in the same way that the 919 patent's contact tab 52 and contact element 47 are electrically connected when the upper housing part 33 is mounted on top of the lower housing part 34. Ex. 1004, FIG. 2, 1:5-12, 2a:1-3:15; Ex. 1001, Abstract, Figs. 2-3, 1:24-27, 1:31-45, 2:13-22, 4:33-5:14, 5:24-27, 5:30-7:2; Ex. 1003, ¶54.

For at least these reasons, a POSITA would have understood that Siemens discloses the claimed "electronic components [that] are arranged in the upper and lower housing parts" (plug connector 5, socket connector 6). Ex. 1003, ¶55.

4. [1.c] said components being electrically connected to one another in a releasable manner by means of a contactmaking system formed from two parts,

As discussed in the immediately preceding section III.B.3, Siemens's plug connector 5 and socket connector 6 are the claimed components. Ex. 1003, ¶¶56-58.

When Siemens's assembly 1 (*i.e.* a first part) is mounted on top of the assembly carrier 4 (*i.e.*, a second part), socket connector 6 and plug connector 5 are electrically connected in a releasable manner. Ex. 1004, FIG. 2, 1:5-12, 2:25-3:15. A POSITA would have understood that this arrangement is a contact-making system formed from two parts in the same way that the 919 patent's contact tab 52 and contact element 47 are electrically connected in the preferred embodiment.

Ex. 1003, ¶57.; Ex. 1001, Abstract, Figs. 2-3, 1:24-27, 1:31-45, 2:13-22, 4:33-5:14, 5:24-27, 5:30-7:2; *see also* sections III.A and III.B.2.

For at least those reasons, a POSITA would have understood that when Siemens's assembly 1 is mounted on the carrier 4, the plug connector 5 and socket connector 6 are "components being electrically connected to one another in a releasable manner by means of a contact-making system formed from two parts." Ex. 1003, ¶58.

> 5. [1.d] wherein the upper housing part is connected to the lower housing part in a manually detachable manner by means of a rotating element arranged on one of the upper housing part or the lower housing part and a slotted guide track arranged on another of the upper housing part or the lower housing part, such that the upper housing part is detached from the lower housing part by a pivoting movement followed by a linear movement,

This limitation requires that the upper and lower housing parts are connected in a manually detachable manner where one of the parts has a rotating element and the other part has a slotted guide track. In the embodiments in the 919 patent, the upper housing part has the slotted guide track, and the lower housing part has the rotating element. *See, e.g.*, Ex. 1001, Figs. 2-3, 4:4-17. In the embodiments in Siemens, it is the opposite, and the rotating element (suspension 2) is in the upper housing part (assembly 1), and the slotted guide track (housing suspension 3) is in the lower housing part (assembly carrier 4). This is irrelevant to the analysis based on the claim language "on one of the upper housing part or the lower housing part," and Siemens discloses this limitation as described below. Ex. 1003, ¶59.

When Siemens's upper housing part (assembly 1) is mounted on top of the lower housing part (assembly carrier 4), the "upper housing part is connected to the lower housing part in a manually detachable manner by means of a rotating element arranged on ... the upper housing part ... and a slotted guide track arranged on ... the lower housing part, such that the upper housing part is detached from the lower housing part by a pivoting movement followed by a linear movement." Specifically, Siemens's suspension 2 is the claimed "rotating element arranged on ... the upper housing part," and Siemens's housing suspension 3 is the claimed "slotted guide track arranged on ... the lower housing part." As shown below, Siemens's suspension 3 is the slotted guide track because it is a slot that guides the suspension 2 into its rotating position in housing suspension 3 and holds it there (during rotation and while it is mounted) in the same way described in the 919 patent. Ex. 1004, 1:5-12, 2a:1-3:1, claim 1; Ex. 1001, 1:64-66 ("Advantageously, the upper housing part comprises a slotted guide track for receiving the rotating element, so the housing part is held and positioned in a simple manner by simply pushing it onto the rotating element."), 4:15-17 ("The slotted guide track 36 forms a guiding and a holder for the rotating element 35 of the lower housing part 34."); 4:26-28 ("Thus, in an inverter 1 mounted in such a

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vertical way, the rotating element 35 rests on the slotted guide track 36 when the upper housing part 33 is hooked on."), 5:9-11 ("In this case, it is again important to design the slotted guide track 36 accordingly, so the upper housing part 33 cannot fall down during pivoting."); *see also*, 4:33-48; Ex. 1003, **¶**60.



As discussed above, Siemens discloses a system in which an installer mounts the assembly 1 on top of the assembly carrier 4 by first seating the suspensions 2 (two lateral pins on assembly 1) in the corresponding housing suspensions 3, and then rotating the assembly 1 to electrically connect plug connector 5 and socket connector 6. Ex. 1004, FIG. 2, 1:5-12, 2:25-3:15; Ex. 1003, ¶61, *see also* sections III.A and III.B.2-III.B.4, above.

To the extent that Siemens does not disclose dismounting the assembly 1 from the assembly carrier 4, it would have been obvious to a POSITA that an installer would dismount assembly 1 by rotating it to disengage and disconnect plug connector 5 from socket connector 6 and then lifting the assembly 1's suspension 2 out of the carrier's housing suspensions 3 with a linear movement to manually detach assembly 1 from assembly carrier 4. There would simply be no other way to properly dismount the assembly 1 from the assembly carrier 4. Ex. 1004, FIG. 2, 1:5-12, 2:25-3:15; *see also* sections III.A and III.B.2-III.B.4, above. Thus, the assembly 1's suspension 2 is the claimed "rotating element arranged on … the upper housing part" and the assembly carrier 4's housing suspension 3 is the claimed "slotted guide track arranged on … the lower housing part." *Id.*; Ex. 1003, ¶62; *see also* annotated Siemens FIG. 2:



At the very least, the upward distance that an installer has to lift the assembly 1 for suspension 2 and to clear the top edge of the housing suspension 3 is linear. It must be linear because the width of the housing suspension 3 is equal to the diameter of suspension 2, so the suspension 2 must travel first in a linear movement up before it then travels in a second linear movement out of housing suspension 3. Ex. 1003, ¶63.

For at least those reasons, a POSITA would have understood that when Siemens's assembly 1 is mounted on top of the carrier 4, the assembly 1 (*i.e.*, "the upper housing part") is connected to the assembly carrier 4 (*i.e.*, "the lower housing part") in a manually detachable manner by means of suspension 2 (*i.e.*, "a rotating element") arranged on the assembly 1 and the housing suspension 3 (*i.e.*, "a slotted guide track") arranged on the assembly carrier 4, such that assembly 1 is detached from assembly carrier 4 by a pivoting movement followed by a linear movement (*i.e.*, rotate-and-lift). Ex. 1003, ¶64.

6. [1.e] wherein the rotating element forms an axis of rotation for a circle arc, and

A POSITA would have understood that Siemens discloses the suspension 2 rotating in a circular arc on its longitudinal axis and therefore is the claimed "rotating element that forms an axis of rotation for a circular arc." Ex. 1004; FIG. 2, 1:5-12, 2:25-3:15; Ex. 1001, Abstract, Figs. 2-3, 1:24-27, 1:31-45, 2:13-22, 4:33-5:14, 5:24-27, 5:30-7:2; Ex. 1003, ¶65; *see also* sections III.A and III.B.2.

7. [1.f] wherein in the upper and lower housing parts, parts of the contact-making system are arranged, respectively, along this circle arc in such a way that these parts, during the pivoting movement of the upper housing part relative to the lower housing part into an operating position, can be automatically electrically connected, with the housing parts connected.

For the reasons discussed above, a POSITA would have understood that Siemens's assembly 1 and assembly carrier 4 (the "upper" and "lower housing parts," respectively, and each being elements "of the contact-making system") are arranged respectively, along this circle arc and that this arrangement allows

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automatic electrical connections due to the pivoting movement of the upper housing part relative to the lower housing part into an operating position. Ex. 1004; FIG. 2, 1:5-12, 2:25-3:15; Ex. 1001, Abstract, Figs. 2-3, 1:24-27, 1:31-45, 2:13-22, 4:33-5:14, 5:24-27, 5:30-7:2; Ex. 1003, ¶66; *see also* sections III.A and III.B.2-III.B.6, and the below annotated Siemens figure 2:



C. Claim 2: The inverter according to claim 1, wherein the slotted guide track extends linearly in a longitudinal direction of the upper housing part for a defined length according to a diameter of the rotating element and then extends to the outside in an

angular manner, thus forming an opening for receiving the rotating element.

Siemens's housing suspension 3 discloses the claimed slotted guide track. Ex. 1004, FIG. 2, 1:5-12, 2:25-3:15; Ex. 1003, ¶¶67-69.

The right side of Siemens's housing suspension 3 extends "a defined length" above the central longitudinal axis of the suspension 2 in the vertical direction, which is the "longitudinal direction" of assembly 1 (*i.e.*, the upper housing part). Ex. 1004, FIG. 2, 1:5-12, 2:25-3:15. The defined length in Siemens is illustrated in the below annotated figure 2:



Ex. 1004, FIG. 2. Further, the width of the extension is equal to the diameter of the suspension 2. *Id.* A POSITA would have understood that the extension ensures that IPR2022-00849 25 Paper 1 - Petition

the suspension 2 remains seated in the housing suspension 3 (and cannot slide out laterally) when the assembly 1 is mounted on top of assembly carrier 4. Ex. 1003, ¶68. Finally, the housing suspension 3 opens in an angular manner that forms an opening for receiving suspension 2 (*i.e.*, the rotating element). Even though the upper-left portion of housing suspension 3 is curved, the corner at the curve restricts the opening to receive suspension 2 to the angle identified in the annotated figures below. Thus, a POSITA would have understood that Siemens's housing suspension 3 is the slotted guide track claimed in claim 2. Ex. 1003, ¶68. The below annotated figures compare Siemens figure 2 to the 919 patent figure 3 and illustrates how the slotted guide tracks for each extend linearly and then to the outside in an angular manner in the same way (indeed, Siemens's angle is greater and the 919 patent's guide track is longer):



To the extent that Patent Owner argues that housing suspension 3 does not extend to the outside in an angular manner because its upper-left portion is curved, it would have been obvious to a POSITA to straighten the edge to make it angular. Doing so is just a simple substitution of one geometric contour (*i.e.*, a straight line) for another geometric contour (*i.e.*, the curved line) to obtain predictable results. To the extent Siemens does not expressly disclose claim 2, it would have been obvious to a POSITA to straighten the upper-left contour of housing suspension 3 to extend it in an angular manner as claimed. Ex. 1003, ¶69.

IV. GROUND 2: SIEMENS COMBINED WITH NOSCHESE RENDERS OBVIOUS CLAIMS 3-7

A. Noschese Overview

Noschese is generally directed to combining shielding and voltage drain protection for well-known electrical connection systems. *See, e.g.*, Ex. 1005, Abstract, 1:8-10, 2:12-48, 3:5-4:6 and claims 1, 7, 14; Ex. 1003, ¶¶70-74.

Noschese discloses a connection system in which an edge of a "daughter printed circuit board 18" is inserted into "receiving area 26" of a "connector 10" of a mother PCB to establish power and signal connections between the mother and daughter boards. *Id.*, Figs. 1-3, Title, Abstract, 1:24-60, 2:12-48, 3:47-59. The daughter board has an "edge connection area 28" that includes "signal pads 40" and "power pads 41." *Id.*, Figs. 2-3, 2:12-48, 3:47-51. The "connector 10" has "signal contacts 14" and "power contacts 15," each of which can be "any suitable type of spring contact." *Id.*, 2:39-40; *see also* Figs. 1-3, 2:12-48. Annotated Noschese figure 2 illustrates these elements:



Ex. 1005, FIG. 2. Annotated figure 1 illustrates that connector 10 includes a "housing 12" sandwiched between two shield members 42 (which provide the shielding protection):


Ex. 1005, FIG. 1, 2:20-38, 2:49-4:6.

When the edge connection area 28 is inserted into receiving area 26, each signal pad 40 makes electrical contact with its respective signal contact 14 and each power pad 41 makes electrical contact with its respective power contact 15. Ex. 1005, 2:39-46, 3:40-46. Annotated Noschese figure 3 illustrates the daughter board partially inserted in the connector where the daughter board is about to slide between spring signal contacts 14 so that they make electrical contact with signals pads 40 (signal contacts 14 and pad 40 are highlighted blue):



Ex. 1005, FIG. 3; see also, 2:5-7, 2:39-46, 3:40-46.

Each of signal contact 14 and power contact 15 includes a "solder tail 30" for connecting the contact to a wire or conductive trace on the mother board 20. Ex. 1005, Fig. 1, 2:12-48. The solder tails 30 can be through-hole (*i.e.*, extend through a hole through the mother board and soldered to a wire or trace on the bottom of the mother board) or surface-mount (*i.e.*, soldered to a wire or trace on the top of the motherboard). *Id*. Annotated Noschese figure 1 illustrates the connector with through-hole solder tails:



Ex. 1005, FIG. 1.

Noschese's insertion connection system is not its inventive concept or a point of novelty, and the specification identifies several prior art patents disclosing such connection systems. Ex. 1001, 1:11-22. Noschese's invention combines shielding and voltage drain protection to such connection systems. Ex. 1004, FIG. 1, 1:19-22, 3:17-4:15. Accordingly, Noschese's connection system was well-known even before March 28, 1994, when it was filed.

B. Motivation to Combine Siemens and Noschese

It would have been obvious to a POSITA to implement Siemens's plug/socket connectors using Noschese's connection system. Ex. 1003, ¶¶75-79. In the combination, a POSITA would have implemented Siemens's plug connector 5 using Noschese's edge connection area 28 and implemented Siemens's socket connector 6 using Noschese's connector 10. Annotated Siemens figure 2 and Noschese figure 2 illustrate the element correspondence for the combination:



Ex. 1004, FIG. 2; Ex. 1005, FIG. 2. Several rationales support the combination.Ex. 1003, ¶¶76-79.

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Substituting Noschese's edge connection area 28 and connector 10 for Siemens's socket and plug connectors, respectively, would have involved combining well-known art according to known methods to yield predictable results and in a manner that neither implicates nor impacts the inventive concepts of either Siemens or Noschese. *See*, Sections III.A and IV.A; Ex. 1003, ¶76. Each of the connectors in the combination would perform the same function it performs in each of Noschese and Siemens references as well as in the 919 patent. *Id*. For example, Noschese's connection system removably connects a mother board and daughter board both mechanically and electrically. Ex. 1005, 2:20-38; Ex. 1003, ¶76.

For the same reasons, implementing Siemens's plug connector 5 using Noschese's edge connection area 28 and implementing Siemens's socket connector 6 using Noschese's connector 10 would have been a simple substitution of known elements to obtain predictable results. Ex. 1003, ¶77. Siemens's invention minimizes the weight borne by the plug connectors in prior art seat-androtate/rotate-and-lift system and Siemens is silent as to any particular implementation of its connectors. Ex. 1004, FIG. 1, 1:19-22, 3:17-4:15. Noschese's invention combines shielding and voltage drain protection. Ex. 1005, 1:8-10, 1:25-59, and claims 1, 7, 14. Neither of the inventive concepts would have impacted a POSITA's ability to combine Siemens and Noschese as described in this Petition. Ex. 1003, ¶77.

Further, the substitution would have been obvious to try as one of a limited number of well-known design choices for making electrical connections (*e.g.*, male/female connections) and would have had a reasonable expectation of success. *See, e.g.*, Ex. 1005, 1:12-22. Therefore, it would have been obvious to substitute Noschese's connection system for Siemens's connectors. Ex. 1003, ¶78.

As discussed below, a POSITA would have recognized that the Siemens and Noschese combination includes each and every element of claims 3-7 of the 919 patent and that the results of the combination were predictable. *See, e.g., KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 416-17, (2007); Ex. 1003, ¶79.

C. Claim 3: The inverter according to claim 1, wherein at least one single element is arranged in one of the upper housing part and the lower housing part, and at least one corresponding contact tab of the contact-making system is arranged in another of the upper housing part and the lower housing part.

In the Siemens/Noschese combination, a POSITA would have understood that Noschese's connector 10 is the claimed "at least one single element" that is "arranged in ... the lower housing part" (*i.e.*, Siemens's assembly 4) and Noschese's edge connection area 28 is the claimed "at least one corresponding contact tab of the contact-making system [that] is arranged in another of the upper housing part and the lower housing part" (*i.e.*, Siemens's assembly 1). Ex. 1004,

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FIG. 2, 1:5-12, 2:25-3:15; Section IV.A; Ex. 1003, ¶¶80-81. A POSITA would have understood that Noschese's connector 10 and daughter board 18 with edge connection area 28, together, are the recited "contact-making system." Ex. 1005, FIGS. 1-2, 2:12-48; Ex. 1003, ¶80. Annotated Noschese figure 2 illustrates how Noschese discloses the recited "tab" (highlighted yellow) and "at least one single element" (highlighted tan):



Ex. 1005, FIG. 2; see also, 2:12-48.

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Thus, a POSITA would have understood claim 3 to be disclosed by and obvious over the Siemens/Noschese combination. Ex. 1003, ¶81.

D. Claim 4: The inverter according to claim 3, wherein a contact element is arranged on one side of a housing of the single element of the contact-making system, and a connecting element for a line or a cable is arranged on another side of the housing, and the contact element and the connecting element are connected to one another.

A POSITA would have understood that Noschese's housing 12 is the claimed "housing of the single element" (where Noschese's connector 10 is the single element). Ex. 1005, FIG. 1, 2:20-3:4; Ex. 1003, ¶82-84. A POSITA would have understood that each of Noschese's signal contacts 14 and 15 is a claimed "contact element arranged on one side of a housing of the single element of the contact-making system." Ex. 1005, FIGS. 1-3, 2:20-48, 3:34-46; Ex. 1003, ¶82. A POSITA would have understood that each of those contacts' solder tail 30 is a claimed "connecting element for a line or a cable is arranged on another side of the housing." Ex. 1005, FIG. 1, 2:20-48; Ex. 1003, ¶82. A POSITA would have understood that the wire or trace to which each solder tail 30 is soldered is a claimed "line or cable." Ex. 1005, FIG. 1, 2:20-48; Ex. 1003, ¶82; see also Section IV.A. Annotated Noschese figure 1 illustrates how Noschese discloses those elements:



Ex. 1005, FIG. 1; Ex. 1003, ¶82.

Noschese discloses that:

The housing 12 has a center section 22 and two end sections 24, 25. The center section 22 has a card edge receiving area 26 for removably receiving the edge connection area 28 of the daughter board 18. The **contacts 14 and 15 are also housed in the center section 22 with tail ends 30 extending out of the bottom of the housing 12**.

Ex. 1005, 2:27-34. A POSITA would have understood that each of Noschese's contacts 14 and 15 is "arranged on one side of a housing of the single element" and

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its respective solder tail 30 is "on another side of the housing" in at least two ways. First, each signal contact 14 (or power contact 15) is arranged inside the housing (*i.e.*, "one side of a housing of the single element") and the contact's solder tail 30 is arranged outside the housing (*i.e.*, "another side of the housing"). Second (though related), each signal contact 14 (power contact 15) is arranged on one side of the bottom of the housing (*i.e.*, "on one side of a housing") and the contact's solder tail 30 is arranged on the other side of the bottom of the housing (*i.e.*, "on another side of the housing"). *See* Ex. 1003, ¶83.

Thus, a POSITA would have understood claim 4 to be disclosed by and obvious over the Siemens/Noschese combination. Ex. 1003, ¶84.

E. Claim 5: The inverter according to claim 4, wherein the contact element is open on a front face of the housing opposite the connecting element for receiving the contact tab.

A POSITA would have understood that each of Noschese's signal contacts 14 and power contacts 15 is open at the front face of housing 12 as claimed. Noschese discloses that housing 12 has a card edge receiving area 26 for removably receiving the edge connection area 28 of the daughter board 18 such that contacts 14 and 15 make electrical contact with pads 40 and 41, respectively, when the edge connection area 28 is inserted into the receiving area 26. Ex. 1005, FIGS. 1-3, 2:12-48; EX. 1003, ¶85-86; *see also* Section IV.A. For the same reasons discussed for claim 4, a POSITA would have understood that each of the

contacts 14 and 15 is open in card edge receiving area 26 so that the contact can receive edge connection area 28 of the daughter board 18. Ex. 1005, FIGS. 1-3, 2:12-48; Ex. 1003, ¶85. A POSITA would have understood that Noschese's card edge receiving area 26 is the claimed "front face of the housing." Ex. 1003, ¶85. A POSITA would have understood that edge receiving area 26 is on the opposite side of the bottom of the housing in relation to the solder tails 30 of each contact as claimed. Ex. 1005, 2:32-48; Ex. 1003, ¶85.

Thus, a POSITA would have understood claim 5 to be disclosed by and obvious over the Siemens/Noschese combination. Ex. 1003, ¶86.

F. Claim 6: The inverter according to claim 4, wherein the contact element is formed by at least one spring contact, wherein a rectangular recess for arrangement of the at least one spring contact is arranged in the housing.

Noschese discloses that "[t]he signal and power contacts 14, 15 can include any suitable type of spring contact." Ex. 1005, 2:39-40. A POSITA would have understood that each contact 14 and 15 is a "contact element [that] is formed by at least one spring contact." Ex. 1003, ¶¶87-88. A POSITA would have understood that Noschese's card edge receiving area 26 is the claimed "rectangular recess for arrangement of the at least one spring contact is arranged in the housing."

Ex. 1003, ¶87.

Thus, a POSITA would have understood claim 6 to be disclosed by and obvious over the Siemens/Noschese combination. Ex. 1003, ¶88.

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G. Claim 7: The inverter according to claim 6, wherein the spring contacts are arranged standing; at an angle of substantially 90° to a supporting surface within the housing, so the contact tab may be inserted into the contact element from above in a circular trajectory.

Noschese figure 3 "is an end view with a partial cut away section of the electrical connector shown in FIG. 2 with the daughter printed circuit board partially inserted therein." Ex. 1005, 2:5-7. A POSITA would have understood that each contact 14 and 15 is "arranged standing[] at an angle of substantially 90°" to the longitudinal sides of housing 12 (each side, "a supporting surface within the housing") because figures 1 and 2 illustrate the contact arranged as claimed and figure 3 does not show contacts 14 (or any other element) with any perspective. Ex. 1003, ¶89-91.

Noschese discloses that connector 10 includes "a card edge receiving area 26 for removably receiving the edge connection area 28 of the daughter board 18." Ex. 1005, 2:28-32. Noschese figures 2 and 3 illustrate that card edge receiving area 26 receives edge connection area 28 "from above" (from the perspective of the top face of the motherboard). *Id.*, FIGS. 2-3, 2:12-48. Noschese figure 3 illustrates edge connection area 28 about to be inserted into signal contact 14. *Id.*, FIG. 2, 2:5-7; 2:12-48. As discussed for claim 1 in Ground 1, Siemens's assembly 1 rotates in a circular trajectory to engage plug connector 5 with socket connector 6 of assembly 4. *See* Section III.B; Ex. 1004 FIG. 2, 2:24-3:12. A POSITA would have

understood that, in the Siemens/Noschese combination, Noschese's edge connection area 28 is inserted into each of Noschese's contacts 14 and 15 "from above in a circular trajectory" as claimed as Siemens's assembly 1 rotates into Siemens's assembly 4. Ex. 1003, ¶90.

Thus, a POSITA would have understood claim 7 to be disclosed by and obvious over the Siemens/Noschese combination. Ex. 1003, ¶91.

V. GROUND 3 WALESA RENDERS OBVIOUS CLAIMS 1-2

A. Walesa Overview

Walesa discloses a system for mounting (seat-and-rotate) motor control modules (*e.g.*, Walesa's modules 14, 16, and 17) on a backplane 12 to interconnect a main module 14 and one or more axis modules 16 and dummy modules 17 and then dismounting (rotate-and-lift) those modules from the backplane. Ex. 1006, FIGS. 1-3, 4:1-9; 4:66-5:2, 5:23-39, 6:15-21, 6:26-7:3, claims 1, 14-15, 24, 28-29; Ex. 1003, ¶92-93. To mount a module, an installer performs a two-step process that seats the module's hook 76 on backplane 12's catch plate 62. Ex. 1006, FIGS. 1-3, 5:23-39, 6:15-21, 6:26-7:3. The installer then pivots (*i.e.*, rotates) the module so that its connector 44 engages and electrically connects with the backplane 12's backplane connector 46. Ex. 1006, FIGS. 1-3, 4:1-9, 5:23-39, 5:58-63, 6:15-21, 6:26-7:3. A guide pin 70 on the module engages an elliptical hole 80 on the backplane to help ensure a proper connection. Ex. 1006, FIGS. 2-3, 6:53-58.

Annotated Walesa figure 3 illustrates mounting a module 14, 16, 17 on the

backplane 12 (seat-and-rotate):



To dismount the module 14, 16, 17 from the backplane 12, the installer simply reverses the order of the two mounting steps and rotates the module to disengage and disconnect the connector 44 from connector 46 and then lifts the hook 76 out from the catch plate 63. Ex. 1006, FIGS. 1-3, 4:1-9; 4:66-5:2, 5:23-39, 6:15-21, 6:26-7:3. Annotated Walesa figure 3 illustrates dismounting a module (rotate-and-lift):



Walesa discloses that the system can be used to make data, low power, and high power connections at the same time:

[I]t is one object of the invention to provide a system for simply and rapidly connecting both data and high power wiring between the motor control modules. Only one connection operation is required for data, low power and high power, and the connection may be performed without the need to move or disconnect adjacent motor control modules.

Ex. 1006, 2:59-64.

B. Claim 1

1. [1.pre] 1. An inverter comprising

For the reasons discussed in the first paragraph of section III.B.1, the preamble of claim 1 is not a limitation.

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Should the Patent Owner argue that the preamble is limiting, Walesa renders it obvious. Walesa discloses a method for mounting on a backplane multiple modules that provide high-voltage, high-power motor drive signals. Ex. 1006, Title, Abstract, FIG. 1, 1:50-54, 2:29-3:12, 3:32-33 ("it is another object of the invention to provide for a high current power and ground pathways"), 3:54-59, 4:22-29, 4:35-41, 4:60-62, 5:3-6, 5:11-14, 5:31-33 ("The backplane 12 includes" three separate conductor sets: a high power conductor set 18, a low power conductor set 20, and a data conductor set 22."), 5:58-6:7. Although Walesa does not expressly disclose mounting an inverter, Walesa teaches both (1) that "main control module 14 receives a source of external power 24 at an internal power supply 26 to produce high power 28 and low power 30," (Ex. 1006, 5:40-42), and (2) that for axis control modules 16, "high power 28 is received at an inverter 47 controllable to provide a motor signal 48 to a motor 50 according to methods well known in the art," (Ex. 1006, 6:2-4 and 5:64-6:7). Thus, it would have been obvious to a POSITA to implement Walesa's seat-and-rotate system for power inverters (which convert direct current to alternating current). Ex. 1003 at ¶94-95.

2. [1.a] an upper and a lower housing part,

Each of Walesa's motor control modules 14, 16, and 17 is an "upper housing part," and Walesa's backplane 12 is a "lower housing part." Ex. 1003, ¶¶96-102.

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Walesa annotated figure 3 below identifies the elements (see also Ex. 1006, FIGS.

1-2, 5:23-39, 5:64-6:7, 6:26-7:3):



Walesa's modules 14, 16, and 17 and backplane 12 operate in the same manner that the claimed upper and lower housing parts operate in all of the disclosed embodiments of the 919 patent. Ex. 1006, FIGS. 1-3, 4:1-9; 4:66-5:2, 5:23-39, 6:15-21, 6:26-7:3, and claims 1, 14-15, 24, 28-29; Ex. 1003 at ¶97.

 For example, each of Walesa's modules 14, 16, and 17 rotates to mount on

 top of backplane 12 in the same manner that the claimed "upper housing part"

 rotates to mount on top of the "lower housing part." Ex. 1006, FIG. 3, 4:1-9,

 4:66-5:2, 6:43-52, claims 1, 14-15, 24, 28-29; Ex. 1001, Abstract, Figs. 2-3, 1:24

 27, 1:31-45, 2:13-22, 4:33-5:14, 5:24-27, 5:62-65, 6:32-58. As noted in

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Section III.B.2, the 919 patent repeatedly characterizes the upper housing part rotating to mount "on top" of or "onto" the lower housing part. Ex. 1001, 1:24-27, 4:53-64. Each of Walesa's modules 14, 16, and 17 rotates to mount on top of or onto backplane 12 in the same way. Ex. 1006, FIGS. 1-3, 4:1-9; 4:66-5:2, 5:23-39, 6:15-21, 6:26-7:3, and claims 1, 14-15, 24, 28-29. For that reason, alone, a POSITA would have understood each of Walesa's module 14, 16, and 17 discloses the claimed "upper housing part" and Walesa's backplane 12 discloses the claimed "lower housing part." Ex. 1003 at ¶98.

There are other relevant examples of how each of Walesa's modules 14, 16, and 17 and backplane 12 operate in the same manner as the claimed "upper housing part" and "lower housing part." Walesa's module 14, 16, and 17 and backplane12 are mounted vertically just like the 919 patent's lower and upper housing parts in the preferred embodiment. *See, e.g.*, Ex. 1001, Figs. 2-3, 4:23-28, 4:33-5:14, 5:24-27, 5:62-65, 6:32-58; Ex. 1006, Figs. 2-3, 3:64-67 ("Thus, it is another object of the invention to permit a simple connector operating in a vertical orientation without the need for complex mechanical locks and the like on the connector."), 6:15-21, 6:26-7:3; Ex. 1003, ¶99.

As discussed below for other limitations of claim 1, each of Walesa's modules 14, 16, and 17 houses a connector 44 and the backplane 12 houses a connector 46 in the same way that the 919 patent's upper housing part 33 houses a

contact tab 52 and its lower housing part 34 houses a contact element 47. Ex. 1006, FIG. 3, 5:23-39, 5:64-6:7, 6:43-58; Ex. 1001, Figs. 2-3, 5:49-7:2. Walesa's connectors 44 and 46 are housed such that when a module 14, 16, or 17 is mounted on top of backplane 12, the module's connector 44 and the backplane's connector 46 are electrically connected in the same way that the 919 patent's contact element 47 and contact tab 52 are electrically connected when the upper housing part 33 is mounted on top of the lower housing part 34. *See, e.g.*, Ex. 1006, FIGS. 1-3, 6-7, 1:12-15, 2:59-67, 5:31-39, 6:44-58; Ex. 1001, Abstract, Figs. 2-3, 1:24-27, 1:31-45, 2:13-22, 4:33-5:14, 5:24-27, 5:30-7:2; Ex. 1003, ¶100.

Walesa's backplane 12 supports the weight of the modules 14, 16, and 17 in the same way that the 919 patent's lower housing part 33 supports the upper housing part 34. Ex. 1006, FIGS. 2-3, 3:60-64, claims 1, 14, 18, 20, 24; Ex. 1001, 4:4-5, 4:26-28; Ex. 1003, ¶101. The below annotated comparison illustrates the similarities between Walesa and the 919 patent (colors indicate correspondence):



For at least the reasons above, a POSITA would have understood Walesa discloses the claimed "upper housing part" (each of modules 14, 16, and 17) and "lower housing part" (backplane 12). Ex. 1003, ¶102.

3. [1.b] wherein electronic components are arranged in the upper and lower housing parts,

Walesa's connector 44 is the claimed electronic component arranged in the upper housing part (*i.e.*, each of modules 14, 16, and 17), and its connector 46 is the claimed electronic component arranged in the lower housing part (*i.e.*, backplane 12). Ex. 1003, ¶¶103-105.

As discussed above, when one of Walesa's modules 14, 16, or 17 is mounted on top of the backplane 12, connectors 44 and 46 are electrically connected in the same way that the 919 patent's contact tab 52 and contact element 47 are electrically connected when the upper housing part 33 is mounted on top of the lower housing part 44. Ex. 1006, FIGS. 1-3, 2:26-29, 4:45-49, 5:23-39, 5:58-6:7, 6:43-58; Ex. 1001, Abstract, Figs. 2-3, 1:24-27, 1:31-45, 2:13-22, 4:33-5:14, 5:24-27, 5:30-7:2; Ex. 1003, ¶104.

For at least these reasons, a POSITA would have understood that Walesa discloses the claimed "electronic components [that] are arranged in the upper and lower housing parts" (connectors 44 and 46, respectively). Ex. 1003, ¶105.

4. [1.c] said components being electrically connected to one another in a releasable manner by means of a contactmaking system formed from two parts,

As discussed in the immediately preceding section V.B.3, Walesa's connectors 44 and 46 are the claimed components. Ex. 1003, ¶¶106-108.

When one of Walesa's modules 14, 16, or 17 (*i.e.* a first part) is mounted on top of the backplane 12 (*i.e.*, a second part), connectors 44 and 46 are electrically connected in a releasable manner. Ex. 1006, FIGS. 1-3, 2:26-29, 4:45-49, 5:23-39, 5:58-6:7, 6:43-58. A POSITA would have understood that this arrangement is a contact-making system formed from two parts in the same way that the 919 patent's contact tab 52 and contact element 47 are electrically connected in the

preferred embodiment. Ex. 1003, ¶107.; Ex. 1001, Abstract, Figs. 2-3, 1:24-27,

1:31-45, 2:13-22, 4:33-5:14, 5:24-27, 5:30-7:2; see also sections V.A and V.B.2.

For at least those reasons, a POSITA would have understood that when one of Walesa's modules 14, 16, or 17 is mounted on the backplane 12, the connectors 44 and 46 are "components being electrically connected to one another in a releasable manner by means of a contact-making system formed from two parts." Ex. 1003, ¶108.

5. [1.d] wherein the upper housing part is connected to the lower housing part in a manually detachable manner by means of a rotating element arranged on one of the upper housing part or the lower housing part and a slotted guide track arranged on another of the upper housing part or the lower housing part, such that the upper housing part is detached from the lower housing part by a pivoting movement followed by a linear movement,

When one of Walesa's modules 14, 16, or 17 (*i.e.*, an upper housing part) is mounted on top of the backplane 12 (*i.e.*, a lower housing part), the "upper housing part is connected to the lower housing part in a manually detachable manner by means of a rotating element arranged on ... the upper housing part ... and a slotted guide track arranged on ... the lower housing part, such that the upper housing part is detached from the lower housing part by a pivoting movement followed by a linear movement." Specifically, Walesa's catch plate 62 is the claimed "rotating element arranged on ... the lower housing part," and Walesa's hook 76 is the claimed "slotted guide track arranged on ... the upper housing part." Walesa's

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hook 76 is the slotted guide track because it is a slot that guides the hook 76 into its rotating position on catch plate 62 and holds it there (during rotation and while it is mounted) in the same way described in the 919 patent. Ex. 1006, FIGS. 1-3, 4:1-9 (*e.g.*, "it is another object of the invention to provide support for the motor control modules that assists in connecting the motor control modules to the backplane by allowing a lever-type engagement about the hanger pivot"); 4:66-5:2, 5:23-39, 6:15-21, 6:26-7:3, claims 1, 14-15, 24, 28-29; Ex. 1001, 1:64-66

("Advantageously, the upper housing part comprises a slotted guide track for receiving the rotating element, so the housing part is held and positioned in a simple manner by simply pushing it onto the rotating element."), 4:15-17; 4:26-28 ("Thus, in an inverter 1 mounted in such a vertical way, the rotating element 35 rests on the slotted guide track 36 when the upper housing part 33 is hooked on."), 5:9-11; *see also*, 4:33-48; Ex. 1003, ¶109. Indeed, Walesa's hook 76 hangs on catch plate 62 in the same way that the 919 patent's slotted guide track 36 hangs on rotating element 35:



Walesa discloses a system in which an installer mounts a module 14, 16, or 17 on top of the backplane 12 by first seating hook 76 on the corresponding catch plate 62, and then rotating the module on top of the backplane to connect connectors 44 and 46. Ex. 1006, FIGS. 1-3, 4:1-9; 4:66-5:2, 5:23-39, 6:15-21, 6:26-7:3, claims 1, 14-15, 24, 28-29; *see also* sections V.A and V.B.2-V.B.4, above. To dismount the module, the installer rotates it to disengage the connectors and then lifts hook 76 off of catch plate 62 and out from the backplate. Ex. 1006, 2:27-29 ("[t]he connectors, engaging and disengaging along a direction perpendicular to the backplane, make installation or removal of individual modules easy."), 6:43-48 ("The hanger mechanism, formed by the hook 76 and horizontal catch plates 62, allows a pivoting motion 79 of the motor control modules so that the module connectors 44 and backplane connectors 46 may be engaged simply by rocking the motor control module downward after the hook 76 is engaged with the horizontal catch plates 62"); Ex. 1003, ¶110. The lifting action requires the module 14, 16, or 17 (*i.e.*, "upper housing part") to travel via a linear movement until the backplane 12's catch plate 62 clears the module's hook 76. *Id.* Annotated Walesa figure 3 (below) illustrates the linear movement:



Thus, a POSITA would have understood that Walesa's catch plate 62 discloses the claimed "rotating element arranged on … the lower housing part," and Walesa's hook 76 is the claimed "slotted guide track arranged on … the upper housing part" at least because Walesa's hook 76 is a slotted guide track that guides the module along catch plate 62 into the module's rotating position and holds it there during rotation and while it is mounted in the same way described in the 919 patent. Ex. 1003, ¶111; *see also* sections V.A and V.B.2-V.B.4, above.

6. [1.e] wherein the rotating element forms an axis of rotation for a circle arc, and

A POSITA would have understood that Walesa discloses each of modules 14, 16, and 17 rotates in a circular arc on a longitudinal axis through the catch plate 62 and therefore is the claimed "rotating element that forms an axis of rotation for a circular arc" (*e.g.*, "pivoting motion 79" in Walesa FIG. 3). Ex. 1006; FIG. 3, 4:1-9, 4:66-5:2, 6:43-52, claims 1, 14-15, 24, 28-29; Ex. 1001, Abstract, Figs. 2-3, 1:24-27, 1:31-45, 2:13-22, 4:33-5:14, 5:24-27, 5:30-7:2; Ex. 1003, ¶112; *see also* sections V.A and V.B.2. Annotated Walesa figure 3 illustrates the arc and axis of rotation:



7. [1.f] wherein in the upper and lower housing parts, parts of the contact-making system are arranged, respectively, along

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this circle arc in such a way that these parts, during the pivoting movement of the upper housing part relative to the lower housing part into an operating position, can be automatically electrically connected, with the housing parts connected.

For the reasons discussed above, a POSITA would have understood that each of Walesa's modules 14, 16, and 17 (each is an "upper housing part") and its backplane 12 (the "lower housing part") are arranged along this circle arc and that this arrangement allows automatic electrical connections between connectors 44 and 46 due to the pivoting movement of the upper housing part relative to the lower housing part into an operating position. Ex. 1006; FIGS. 1-3, 4:1-9; 4:66-5:2, 5:23-39, 6:15-21, 6:26-7:3, claims 1, 14-15, 24, 28-29; Ex. 1001, Abstract, Figs. 2-3, 1:24-27, 1:31-45, 2:13-22, 4:33-5:14, 5:24-27, 5:30-7:2; Ex. 1003, ¶113; *see also* sections V.A and V.B.2-V.B.6.

C. Claim 2: The inverter according to claim 1, wherein the slotted guide track extends linearly in a longitudinal direction of the upper housing part for a defined length according to a diameter of the rotating element and then extends to the outside in an angular manner, thus forming an opening for receiving the rotating element.

Walesa's hook 76 discloses the claimed slotted guide track and its catch plate 62 discloses the claimed rotating element. Ex. 1006, FIG. 3, 6:26-58. Walesa's hook 76 extends "a defined length" below catch plate 62 in the vertical direction, which is a "longitudinal direction" of each of modules 14, 16, or 17 (*i.e.*, the upper housing part). Ex. 1006, FIGS. 2-3, 6:26-58. Although Walesa discloses

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a square catch plate 62, and a hook 76 with a width greater than the diameter of that square, it would have been obvious to a POSITA to make catch plate 62 circular and the width of hook 76 equal to the diameter of that circle. Ex. 1003, ¶114. Doing so would have been just a simple substitution of one geometric shape of catch plate 62 (e.g., circular, with a diameter equal to the diagonal of catch plate 62) for another geometric shape (*i.e.*, square) to obtain predictable results and would have been unrelated to any point of novelty for either Walesa or the 919 patent. Ex. 1003, ¶114. Similarly, making the width of hook 76 equal to the diameter of the circle would have been a simple substitution unrelated to any point of novelty for either Walesa or the 919 patent. Ex. 1003, ¶114. A POSITA would have understood that a hook 76 with width equal to the diameter of a circular catch plate 62 would ensure that the module 14, 16, or 17 remains seated on catch plate 62 and could not slide out laterally when the module is mounted on top of backplane 12. Ex. 1003, ¶114.

Finally, Walesa's hook 76 opens in a right (or nearly so) angle manner as indicated in the annotated Walesa figure 3 and 919 patent figure 3 below.



Thus, a POSITA would have understood that Walesa's hook 76 is the slotted guide track claimed in claim 2. Ex. 1003, ¶115.

VI. GROUND 4: WALESA COMBINED WITH NOSCHESE RENDERS OBVIOUS CLAIMS 3-7

A. Motivation to Combine Walesa and Noschese

As discussed in section IV.A of Ground 2, Noschese discloses a well-known connection system. It would have been obvious to a POSITA to apply Noschese's teachings and combine Walesa and Noschese by implementing each of Walesa's connectors 46 as a Noschese's connector 10 and each of Walesa's connectors 44 as a Noschese's "edge connection area 28." Ex. 1003, ¶116-117. The same rationales

for combining Siemens and Noschese discussed in Section IV.B are also rationales for combining Walesa and Noschese; Ex. 1003, ¶116.

A POSITA would have recognized that Walesa and Noschese include each and every element of claims 3-7 of the 919 patent and that the results of the combination were predictable. *See, e.g., KSR Int'l Co. v. Teleflex Inc.,* 550 U.S. 398, 416-17, (2007); Ex. 1003, ¶117.

B. Claim 3: The inverter according to claim 1, wherein at least one single element is arranged in one of the upper housing part and the lower housing part, and at least one corresponding contact tab of the contact-making system is arranged in another of the upper housing part and the lower housing part.

For the same reasons discussed in Ground 2 for this claim, a POSITA would

have understood that Noschese discloses the elements of this claim discussed in

that ground. See Section IV.C.

Thus, a POSITA would have understood claim 3 to be disclosed by and

obvious over the Walesa/Noschese combination. Ex. 1003, ¶¶118-119.

C. Claim 4: The inverter according to claim 3, wherein a contact element is arranged on one side of a housing of the single element of the contact-making system, and a connecting element for a line or a cable is arranged on another side of the housing, and the contact element and the connecting element are connected to one another.

For the same reasons discussed in Ground 2 for this claim, a POSITA would

have understood that Noschese discloses the elements of this claim discussed in

that ground. See Section IV.D.

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Thus, a POSITA would have understood claim 4 to be disclosed by and obvious over the Walesa/Noschese combination. Ex. 1003, ¶¶120-121.

D. Claim 5: The inverter according to claim 4, wherein the contact element is open on a front face of the housing opposite the connecting element for receiving the contact tab.

For the same reasons discussed in Ground 2 for this claim, a POSITA would

have understood that Noschese discloses the elements of this claim discussed in

that ground. See Section IV.E.

Thus, a POSITA would have understood claim 5 to be disclosed by and

obvious over the Walesa/Noschese combination. Ex. 1003, ¶¶122-123.

E. Claim 6: The inverter according to claim 4, wherein the contact element is formed by at least one spring contact, wherein a rectangular recess for arrangement of the at least one spring contact is arranged in the housing.

For the same reasons discussed in Ground 2 for this claim, a POSITA would

have understood that Noschese discloses the elements of this claim discussed in

that ground. See Section IV.F.

Thus, a POSITA would have understood claim 6 to be disclosed by and

obvious over the Walesa/Noschese combination. Ex. 1003, ¶124-125.

F. Claim 7: The inverter according to claim 6, wherein the spring contacts are arranged standing; at an angle of substantially 90° to a supporting surface within the housing, so the contact tab may be

inserted into the contact element from above in a circular trajectory.

For the same reasons discussed in Ground 2 for this claim, a POSITA would have understood that Noschese discloses the elements of this claim discussed in that ground. *See* Section IV.G.

Thus, a POSITA would have understood claim 7 to be disclosed by and

obvious over the Walesa/Noschese combination. Ex. 1003, ¶126-127.

VII. CONCLUSION

For the foregoing reasons, Petitioner requests that the Board institute trial and cancel claims 1-7 of the 919 patent.

VIII. COMPLIANCE WITH FORMAL REQUIREMENTS

A. Mandatory Notices Under 37 C.F.R. §§ 42.8(b)(1)-(4)

1. Real Party-In-Interest

SolarEdge Technologies, Inc. is the real party-in-interest.

2. Related Matters

According to the assignment records at the USPTO, the 919 patent is

currently owned by Fronius International GmbH ("Fronius"). To the best of

Petitioner's knowledge, there are no related matters involving the 919 patent.

3. Lead and Backup Counsel

Lead Counsel	Backup Counsel
Matthew D. Satchwell (Reg. No. 58,870)	Gianni Minutoli (Reg. No. 41,198)
matthew.satchwell@dlapiper.com	gianni.minutoli@us.dlapiper.com
DLA Piper LLP (US)	DLA Piper LLP (US)

444 West Lake Street, Suite 900	11911 Freedom Dr., Suite 300
Chicago, Illinois 60606	Reston, VA 20190
Telephone: (312) 368-2111	Telephone: (703) 773-4045
Fax: (312) 236-7516	Fax: (703) 773-5019
	Jeffrey Cole (Reg. No. 56,052)
	jeff.cole@us.dlapiper.com
	DLA Piper LLP (US)
	303 Colorado Street, Suite 3000
	Austin, Texas 78701-4653
	Telephone: (512) 457-7035
	Fax: (512) 457-7001

4. Service Information

Service information for lead and back-up counsel is provided in the designation of lead and back-up counsel above. SolarEdge consents to electronic service to lead and back-up counsel and to DLA-SolarEdgeIPR@us.dlapiper.com.

B. Proof of Service on the Patent Owner

As identified in the attached Certificate of Service, a copy of this Petition and supporting evidence is being served to the Patent Owner's attorney of record at the address listed in the USPTO's records by overnight courier pursuant to 37 C.F.R. §§ 42.6 & 42.105(b).

C. Power of Attorney

A power of attorney is being filed with designation of counsel in accordance with 37 C.F.R. § 42.10(b).

D. Standing

In accordance with 37 C.F.R. §42.104(a), Petitioner certifies that the 919 patent is available for *inter partes* review and that Petitioner is not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in this Petition.

E. Fees

The undersigned authorizes the Director to charge the fee specified by 37 C.F.R. § 42.15(a) and any additional fees that might be due in connection with this Petition to Deposit Account No. 50-3266.

Dated: April 14, 2022

Respectfully Submitted,

/Matthew D. Satchwell /

Matthew D. Satchwell Reg. No. 58,870

Attorney for Petitioner SolarEdge Technologies, Inc.

CERTIFICATION UNDER 37 CFR § 42.24(d)

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies

that the word count for the foregoing Petition for Inter Partes Review totals

10,600, as calculated by Microsoft Word, which is less than the 14,000 allowed

under 37 CFR § 42.24(a)(i).

Dated: April 14, 2022

Respectfully Submitted,

/Matthew D. Satchwell/

Matthew D. Satchwell Reg. No. 58,870

Attorney for Petitioner SolarEdge Technologies, Inc.

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(b), the undersigned hereby certifies that a copy of the foregoing Petition for *Inter Partes* Review and all Exhibits was provided to Patent Owner by overnight courier to the following attorneys of record for the Patent Owner:

Collard & Roe, P.C. 1077 Northern Boulevard Roslyn, NY 11576

Dated: April 14, 2022

Respectfully Submitted,

/Matthew D. Satchwell /

Matthew D. Satchwell Reg. No. 58,870

Attorney for Petitioner SolarEdge Technologies, Inc.