

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ABB INC.,
Petitioner,

v.

NORTHWESTERN UNIVERSITY,
Patent Owner.

IPR2022-00216
Patent 6,907,317 B2

Before KEN B. BARRETT, MEREDITH C. PETRAVICK, and
PAUL J. KORNICZKY, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. *Background and Summary*

ABB Inc. (“Petitioner”)^{1,2} filed a Petition requesting *inter partes* review of U.S. Patent No. 6,907,317 B2 (“the ’317 patent,” Ex. 1001). Paper 1 (“Pet.”). The Petition challenges the patentability of claims 1–6, 9, 11–13, 17, 18, 33–35, and 37 of the ’317 patent. Northwestern University (“Patent Owner”)³ filed a Preliminary Response to the Petition. Paper 10 (“Prelim. Resp.”).

An *inter partes* review may not be instituted “unless . . . the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (2018). Having considered the arguments and evidence presented by Petitioner and Patent Owner, we determine that Petitioner has not demonstrated a reasonable likelihood of prevailing on at least one of the challenged claims of the ’317 patent. Accordingly, we do not institute an *inter partes* review of the challenged claims.

¹ Petitioner identifies ABB Inc., KUKA AG, Reis Robotics USA Inc., and ABB Ltd. as real parties-in-interest. Pet. 1.

² The caption of the Petition also lists KUKA AG and Reis Robotics USA Inc. as Petitioners. After the filing of the Petition, their involvement in this case was terminated upon request due to settlement. *See* Paper 11.

³ Patent Owner identifies Northwestern University as the real party-in-interest. Paper 6, 1.

B. Related Proceedings

One or both parties identify, as matters involving the '317 patent:

- *Northwestern University v. ABB Ltd. and ABB Inc.*, No. 1:21-cv-150 (D. Del.);
- *Northwestern University v. KUKA AG and Reis Robotics USA Inc. d/b/a KUKA Industries*, No. 1:21-cv-599 (N.D. Ill.);
- *Northwestern University v. Fanuc Corporation and Fanuc America Corp.*, No. 1:21-cv-596 (N.D. Ill.);
- *Northwestern University v. Mitsubishi Electric Corp., et al.*, No. 1:21-cv-607 (N.D. Ill.);
- *Northwestern University v. Universal Robots A/S and Universal Robots USA, Inc.*, No. 1:21-cv-149 (D. Del.); and
- *Northwestern University v. Yaskawa Electric Corporation, et al.*, No. 1:21-cv-603 (N.D. Ill.).

Pet. 1–2, Paper 6, 1.

C. The '317 Patent

The '317 patent “relates to the field of programmable robotic manipulators and assist devices, and in particular, robotic manipulators and assist devices that can interact with human operators.” Ex. 1001, 1:6–9. The '317 patent explains that, in, for example, manufacturing assembly line and material handling situations, mechanical assistance to a human operator may be desirable because a payload may be too heavy for the operator, to allow more rapid movement, or to avoid strain, fatigue, and repetitive motion injuries. *Id.* at 1:13–20. In the Background of the Invention section of the Specification, the '317 patent describes Intelligent Assist Devices. *See id.* at 1:62–2:56.

Intelligent Assist Devices (“IADs”) are a class of computer-controlled machines that interact with a human operator to assist in moving a payload. IADs may provide a human operator a variety of types of assistance, including supporting payload weight, helping to overcome friction or other resistive forces, helping to guide and direct the payload motion, or moving the payload without human guidance. The Robotics Industries Association T15 Committee on Safety Standards for Intelligent Assist Devices describes IADs as a single or multiple axis device that employs a hybrid programmable computer-human control system to provide human strength amplification, guiding surfaces, or both. These multifunctional assist devices are designed for material handling, process and assembly tasks that in normal operation involve a human presence in its workspace. Typically, Intelligent Assist Devices (IADs) are force-based control devices that range from single axis payload balancing to multiple degree of freedom articulated manipulators.

Id. at 1:62–2:12. The Specification, in later explaining the benefits of the computer interface in an IAD, states that:

Currently, assist devices are immobile when not driven by a worker. In contrast, a device that performs autonomous programmable motion is called a robot and if an operation is to be performed by a robot, human workers must be excluded from the vicinity for their own safety. So a particular task is generally either robotic or non-robotic, and with few options in between. IADs, however, by virtue of their computer interface can make mixed tasks possible, which may be termed “semi-autonomous behavior”. IADs make semi-autonomous behaviors possible in proximity and collaboration with human workers.

Id. at 3:51–62.

According to the ’317 patent, “needed is the ability to connect and integrate a number of IAD components to work together, and a computer interface design that allows [a] technician or system integrator to easily program, operate and monitor the status of an IAD system made up of a

plurality of components.” *Id.* at 2:51–56. To that end, the ’317 patent describes a multi-functional hub, “which serves as a communication center for the operator, integrator and for system components . . . [and] can also act as a mechanical component of the system to support a tooling or payload and integrate electrical and pneumatic components of the system.” *Id.* at 3:30–36.

Reproduced below is Figure 1 of the ’317 patent.

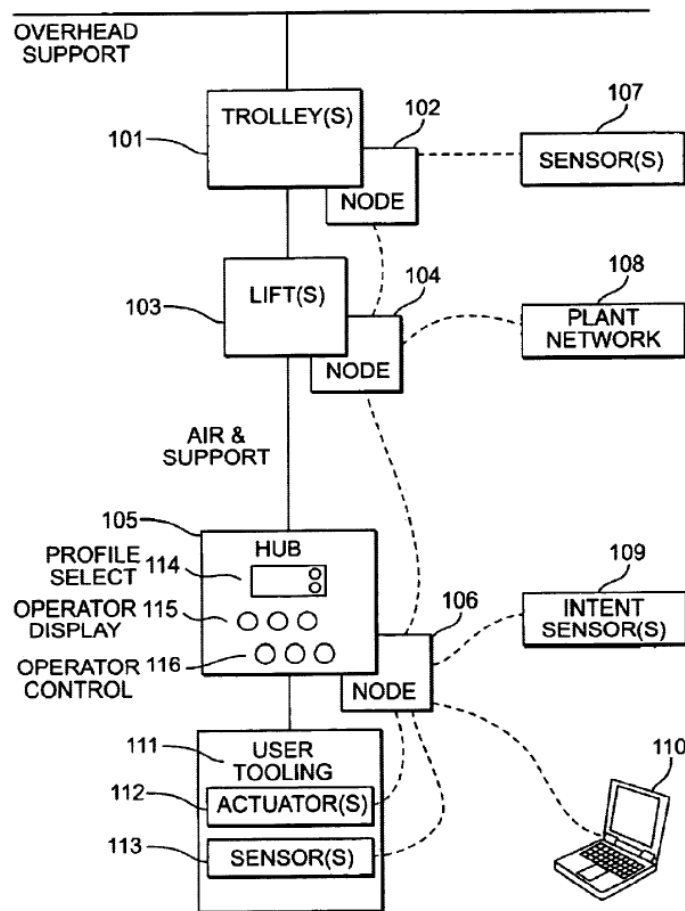


FIG. 1

Figure 1 depicts a high-level block diagram illustrating an exemplary modular architecture for an overhead rail system. *See id.* at 6:21–24, 35–36.

“The described modular architecture includes the interconnection of

modules such as a trolley 101, lift 103, sensor 107, hub 105, intent sensor 109, and user tooling 111 via computational nodes 102, 104, and 106 to plant information systems such as a plant network 108 and user-supplied or system-integrator-supplied components such as computer 110.”

Id. at 6:36–42.

Computational nodes 102, 104, 106 generally include a central processing unit (CPU) or digital signal processing (DSP) unit or microcontroller, or other computational device capable of running a stored program and capable of communication with modules, and also having digital and analog inputs and outputs in order to receive signals from sensors and switches and to control motors and other actuators and indicators.

Id. at 8:9–14.

[A]n exemplary hub logic panel . . . relates to programming of the logic functions of the IAD, such as conditions under which the IAD may move beyond a particular height. It also relates to programming of the digital and analog inputs and outputs which are available to the system integrator or installer via connector in hub 105. The system integrator or installer may take advantage of programmable logic to reduce the need for discrete logic components, or even, as is common practice, for pneumatic logic components.

Id. at 16:64–17:6.

D. Illustrative Claim

Of the challenged claims of the '317 patent, claim 1 is the sole independent claim. Claim 1, reproduced below, is illustrative.

1. A multi-function hub for use in an intelligent assist system, the multi-function hub comprising:
 - a physical interface configured and arranged to be a central interface point for an operator;
 - a computational node disposed on the physical interface, the computational node comprising programmable logic for implementing program controlled functions; and
 - an input/output (“I/O”) interface for interfacing with an information network and disposed on the physical interface, the I/O interface being adapted to communicate with the computational node on the physical interface and at least one computational node disposed on at least one other module within the intelligent assist system wherein the I/O interface communicates with the computational node disposed on the other module via a common data link, and the I/O interface uses a digital communication protocol to communicate with the computational node on the other module via the common data link.

Ex. 1001, 19:29–48.

E. Evidence

Petitioner relies on the following references:

Reference	Exhibit No.
SHIMON Y. NOF, HANDBOOK OF INDUSTRIAL ROBOTICS (2d ed. copyright 1999) (“Handbook” or “The Handbook”)	1004
Michael Peshkin & J. Edward Colgate, <i>Cobots</i> , 46 INDUSTRIAL ROBOT: AN INTERNATIONAL JOURNAL 335 (1999) (“Peshkin”)	1005
US 6,362,813 B1, filed July 20, 1996, issued March 26, 2002 (“Wörn”)	1006

Petitioner also relies on the declaration of David Alan Bourne (Ex. 1003) in support of its arguments. The parties also rely on other exhibits as discussed below.

F. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims are unpatentable on the following grounds⁴:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–6, 9, 11–13, 17, 18, 33–35, 37	102(a), (b)	The Handbook
1–6, 9, 11–13, 17, 18, 33–35, 37	103(a)	The Handbook, Knowledge of a Person of Ordinary Skill in the Art (“POSITA”)
1–6, 9, 11–13, 17, 18, 33–35, 37	103(a)	The Handbook, Peshkin, Knowledge of a POSITA
1–6, 9, 11–13, 17, 18	102(e)	Wörn
1–6, 9, 11–13, 17, 18	103(a)	Wörn, Peshkin, Knowledge of a POSITA
33–35, 37	103(a)	Wörn, Peshkin, The Handbook, Knowledge of a POSITA

II. ANALYSIS

A. Principles of Law

Petitioner bears the burden of persuasion to prove unpatentability of the claims challenged in the Petition, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

⁴ The ’317 patent was filed before the effective date of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), and we apply the pre-AIA versions of 35 U.S.C. §§ 102 and 103.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. Inc., v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987); *see also Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1334 (Fed. Cir. 2008) (to anticipate a patent claim under 35 U.S.C. § 102, “a single prior art reference must expressly or inherently disclose each claim limitation”). Moreover, “[b]ecause the hallmark of anticipation is prior invention, the prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)). Whether a reference anticipates is assessed from the perspective of one of ordinary skill in the art. *See Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1368–69 (Fed. Cir. 2003) (“‘[T]he dispositive question regarding anticipation [i]s whether *one skilled in the art* would reasonably understand or infer from the [prior art reference’s] teaching’ that every claim element was disclosed in that single reference.” (second and third alterations in original) (quoting *In re Baxter Travenol Labs.*, 952 F.2d 388, 390 (Fed. Cir. 1991))).

Additionally, under the principles of inherency, if the prior art necessarily functions in accordance with, or includes, the claimed limitations, it anticipates. *MEHL/Biophile Int’l Corp. v. Milgraum*, 192 F.3d 1362, 1365 (Fed. Cir. 1999) (citation omitted); *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1349–50 (Fed. Cir. 2002).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) any objective evidence of obviousness or non-obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. The Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (internal quotation marks and citation omitted).

Petitioner contends that:

A [person of ordinary skill in the art] as of the filing date of the '317 patent would have had a Bachelor's degree in mechanical engineering, computer engineering, computer science or a similar discipline, with at least three years of relevant industry or research experience, including experience designing or implementing intelligent assist devices or robots. Additional work or research experience can substitute for less or different education, and vice-versa.

Pet. 15 (citing Ex. 1003 ¶ 39). Patent Owner, for purposes of the Preliminary Response, does not dispute Petitioner's definition. Prelim. Resp. 4.

Petitioner’s definition is consistent with the level of ordinary skill reflected in the prior art references of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (recognizing that the prior art itself may reflect an appropriate level of skill in the art). For purposes of this decision, we apply Petitioner’s description of the person of ordinary skill in the art.

C. Claim Construction

We apply the same claim construction standard used in district court actions under 35 U.S.C. § 282(b), namely that articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b) (2020). In applying that standard, claim terms generally are given their ordinary and customary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Independent claim 1 begins with the recitation: “A multi-function hub for use in an intelligent assist system, the multi-function hub comprising” Ex. 1001, 19:29–30. Petitioner contends that the claim’s preamble is limiting, arguing that “the specification indicates that the use of an ‘intelligent assist device’ is a critical part of the alleged invention” and that the claim body’s recitation of “the intelligent assist system” “relies upon the preamble for antecedent basis.” Pet. 15–16 (citations omitted). Petitioner describes two possible constructions for the term “intelligent assist

system,” arguing that the Board should adopt the “narrower” construction. *Id.* at 16–18. Petitioner, however, also argues that “the [challenged] claims are invalid under either construction, or under any other construction that [Patent Owner] conceivably could advance in this proceeding.” *Id.* at 18.

In response, Patent Owner states that it “does not take a position” and that, “[u]nder either construction, Petitioner cannot meet its burden to prove unpatentability.” Prelim. Resp. 9–10.

For the reasons discussed below, we determine—regardless as to whether the preamble is limiting and the meaning of “intelligent assist system”—that Petitioner has not demonstrated that there is a reasonable likelihood of prevailing in its challenges. Therefore, we need not and do not reach Petitioner’s claim construction contentions.

On this record and for purposes of this decision, we determine that no claim terms require express construction.

D. The Alleged Anticipation of Claims 1–6, 9, 11–13, 17, 18, 33–35, and 37 by The Handbook (Ground 1)

Petitioner alleges that claims 1–6, 9, 11–13, 17, 18, 33–35, and 37 of the ’317 patent are anticipated by The Handbook. *See* Pet. 19–41 (addressing claim 1). For reasons discussed below, Petitioner has not shown a reasonable likelihood that it would prevail in establishing unpatentability of independent claim 1 or its dependent claims as anticipated by The Handbook.

1. The Handbook (Ex. 1004)

The Handbook, which is the second edition of the “Handbook of Industrial Robotics” and bears a copyright of 1999, contains sixty-six

chapters having different authors. *See* Ex. 1004, 3–4, 6–8⁵. According to the author of a Guest Forward:

Presently the field of industrial robotics is expanding rapidly. The second edition of *The Handbook of Industrial Robotics* will contribute to this new robot age. The material covered in this Handbook reflects the new generation of robotics developments. It is a powerful educational resource for students, engineers, and managers, written by a leading team of robotics experts.

Id. at 12 (Handbook page xiv).

Chapter 4 is titled “Emerging Trends and Industry Needs”; Chapter 12 is titled “Design of Robot Controllers”; and Chapter 18 is titled “On-Line Programming.” Ex. 1004, 50, 227, 346 (Handbook pages 31, 213, 337).

2. Discussion

Pertinent to the dispositive issue, independent claim 1 recites, “a computational node disposed on the physical interface, *the computational node comprising programmable logic* for implementing program controlled functions.” Ex. 1001, 19:33–35 (emphasis added). Thus, the recited programmable logic is required to be part of the computational node, and that node is required to be disposed on the interface.

Patent Owner argues that the Petitioner entirely ignores the “programmable logic” aspect of the subject limitation and that the declaration of Petitioner’s witness lacks “any evidence, explanation, or analysis of how and why the Handbook teaches a node with programmable

⁵ In the Petition, the citations to The Handbook typically include only the page number in the document itself or to a figure number. For clarity, we cite to the pages of the exhibit and occasionally include a parallel citation to the page or figure number in the underlying document to aid in cross-referencing Petitioner’s arguments.

logic as claimed.” Prelim. Resp. 12–15 (citing, *inter alia*, Pet. 29–31; Ex. 1003 ¶¶ 101–103). Patent Owner’s argument is persuasive.

Petitioner contends that “The Handbook discloses all limitations of claim 1 in two different structures that independently anticipate the claim.” Pet. 20 (citing Ex. 1003 ¶ 81). For the first theory, Petitioner asserts that the robot controller of Chapter 12 corresponds to the claimed “multi-function hub,” and maps the robot controller’s teach pendant to the recited “physical interface.” *See id.* at 20 (Petitioner’s annotated version of Figure 5 of Chapter 12 (Ex. 1004, 232)), 28 (“In the instance where the robot controller is the ‘multi-function hub,’ the physical interface is the teach pendant.”). For the second theory, Petitioner, citing both Chapters 12 and 18, asserts that a teach pendant itself corresponds to the claimed “multi-function hub,” and maps a teach pendant to the recited “physical interface.” *See id.* at 21 (providing an annotated version of Figure 7 of Chapter 18 (Ex. 1004, 355)), 29 (“In the instance where the teach pendant is itself the ‘multi-function hub,’ the screen and keys of the teach pendant again serve as the physical interface of the claims.” (citing Ex. 1004, 215 (Figures 2 and 3 of Chapter 12))).

For the subject limitation and under both theories, Petitioner contends that the teach pendant itself is a computational node and that the teach pendant also includes a computing unit that is a computational node. *See* Pet. 29–30. Petitioner presents arguments directed to how the teach pendant has computing capability. *See id.* at 29–31 (citing, *inter alia*, Ex. 1003 ¶¶ 101–103). The Petition’s discussion of the subject limitation then concludes with the following:

Accordingly, it is apparent from the appearance of the teach pendant shown in Fig. 2 and its described function that a

computational node is disposed on the teach pendant.
EX-1003, ¶103. Thus, the Handbook discloses this limitation.
Id. at 31 (paragraphing omitted); *see also* Ex. 1004, 229 (the referenced Figure 2 of Chapter 12, which is a photograph of a teach pendant).

As such, the argument in the Petition is that The Handbook discloses a computational node disposed on the physical interface. However, that addresses only the first phrase of the subject limitation. The limitation goes on to recite, “the computational node comprising programmable logic for implementing program controlled functions.” Ex. 1001, 19:34–35. The section of the Petition addressing the subject limitation does not contain the term “programmable logic” other than in the section heading and does not contain any discernable discussion of that aspect of the limitation. *See* Pet. 29–31. Additionally, Petitioner does not offer a proposed construction of “programmable logic,” or otherwise explain adequately how a person of ordinary skill in the art would understand that term. *See, e.g.*, Pet. 15–18 (Claim Construction section of the Petition); *cf.* Prelim. Resp. 13–14 n.1 (Patent Owner arguing that the ’317 patent (Ex. 1001, 17:3–6) indicates that “not all logic is ‘programmable logic.’”). Accordingly, we determine that the Petition fails to address adequately the claim’s requirement that the multi-function hub have, on the physical interface, a “computational node comprising programmable logic for implementing program controlled functions.”

We also have reviewed the cited paragraphs of the witnesses’ declaration. Although the declarant does mention “programmable logic” in asserting that The Handbook discloses the recited language, the testimony provides no more substance than the Petition regarding that term. *See* Ex. 1003 ¶¶ 101–103. The declarant opines, for example, that “[i]t is

apparent from the appearance of the teach pendant shown in Fig. 2 of the Handbook and its described functionality that a computational node comprising programmable logic for implementing program controlled functions is ‘disposed on’ the physical interface, namely, the teach pendant.” Ex. 1003 ¶ 103. The declaration then presents testimony apparently directed to this “described functionality,” namely opinion as to how the teach pendant has computing capability. *See id.* The referenced Figure 2 is reproduced below.



Figure 2 Teach pendant (courtesy Fanuc Ltd., Yamanashi, Japan).

Figure 2 of Chapter 12 of The Handbook, shown above, is a photograph of a teach pendant. Ex. 1004, 229. The declarant does not explain how, if at all, this photograph discloses “programmable logic for implementing program controlled functions” as required by claim 1. *See* Ex. 1003 ¶ 103. Although the declarant’s conclusion contains, unlike the argument in the Petition, the “comprising programmable logic” phrase, the declarant fails to provide any

basis for that aspect of the opinion. *See* Ex. 1003 ¶¶ 101–103 (concluding with the assertion: “Accordingly, a computational node comprising programmable logic for implementing program-controlled functions is ‘disposed on’ the teach pendant.”). The declarant’s testimony on this dispositive issue is conclusory, unpersuasive, and inadequate to show that Petitioner has demonstrated a reasonable likelihood of proving that The Handbook discloses the “programmable logic” aspect of the limitation.

Petitioner has failed to make a threshold showing regarding the “programmable logic” limitation of independent claim 1. All of the remaining challenged claims in this ground depend from independent claim 1 and, therefore, also require the “programmable logic” limitation⁶. We determine that Petitioner has failed to demonstrate a reasonable likelihood of prevailing on its challenge to claims 1–6, 11–13, 17, 18, 33–35, and 37 as being anticipated by The Handbook.

⁶ We acknowledge that Petitioner, for dependent claims 2 and 3, which further limit the programmable logic, uses the phrase “programmable logic” in its arguments. *See* Pet. 42–44. However, neither the Petition nor the opinion in the cited paragraphs of the declaration explains adequately how The Handbook discloses “programmable logic” within the meaning of the ’317 patent. *See id.*; Ex. 1003 ¶¶ 127–134.

E. The Alleged Obviousness of Claims 1–6, 9, 11–13, 17, 18, 33–35, and 37 Over The Handbook and the Knowledge of a POSITA (Ground 2), and The Alleged Obviousness of Claims 1–6, 9, 11–13, 17, 18, 33–35, and 37 Over The Handbook, Peshkin, and the Knowledge of a POSITA (Ground 3)

Petitioner offers Ground 2 in the alternative to Ground 1, contending that the challenged claims would have been obvious if it is determined that “the evidence presented in Ground 1 for the Handbook does not relate to a common teaching or disclosure or a common embodiment.” Pet. 65.

Petitioner also offers Ground 3 in the alternative, contending that “[i]f for some reason the Board finds that the Handbook does not disclose an ‘intelligent assist system’ under either [the ‘broader’ or ‘narrower’] construction, then the Challenged Claims are still rendered obvious by the Handbook in view of Peshkin and the knowledge of a POSITA.” *Id.* at 66. Petitioner asserts that Peshkin discloses an “intelligent assist system” under any possible construction. *Id.*

Petitioner, in its articulation of Grounds 2 and 3, does not address the “programmable logic” limitation. *See id.* at 65–69. Thus, neither Ground 2 nor Ground 3 remedies the flaw in Ground 1, and Petitioner has failed to demonstrate a reasonable likelihood of prevailing on its challenges of Grounds 2 and 3.

F. The Alleged Anticipation of Claims 1–6, 9, 11–13, 17, and 18 by Wörn (Ground 4)

Petitioner alleges that claims 1–6, 9, 11–13, 17, and 18 of the ’317 patent are anticipated by Wörn. *See* Pet. 69–81 (addressing claim 1). For reasons discussed below, Petitioner has not shown a reasonable likelihood that it would prevail in establishing unpatentability of independent claim 1 or its dependent claims as anticipated by Wörn.

1. *Wörn* (Ex. 1006)

Wörn “pertains to a control and programming means for a manipulator.” Ex. 1006, 1:3–5. Figure 1 of Wörn is reproduced below.

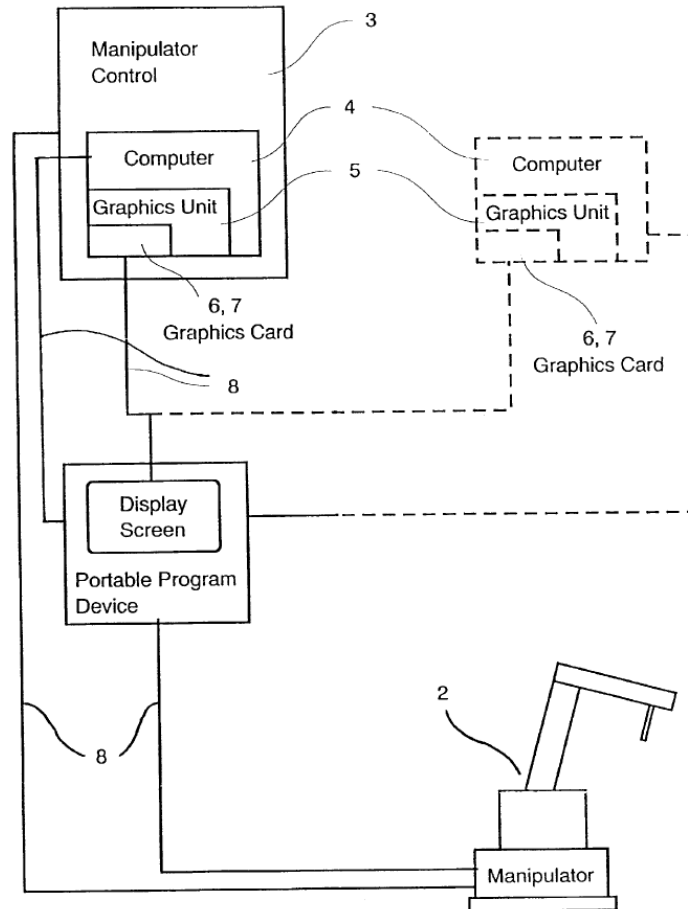


Fig. 1

Figure 1 is a schematic overview of Wörn's control and programming means in connection with a manipulator and a manipulator control. *Id.* at 3:27–29. A programming device may be used to remotely control and program the manipulator. *Id.* at 3:66–4:5.

Figure 3 of Wörn is reproduced below.

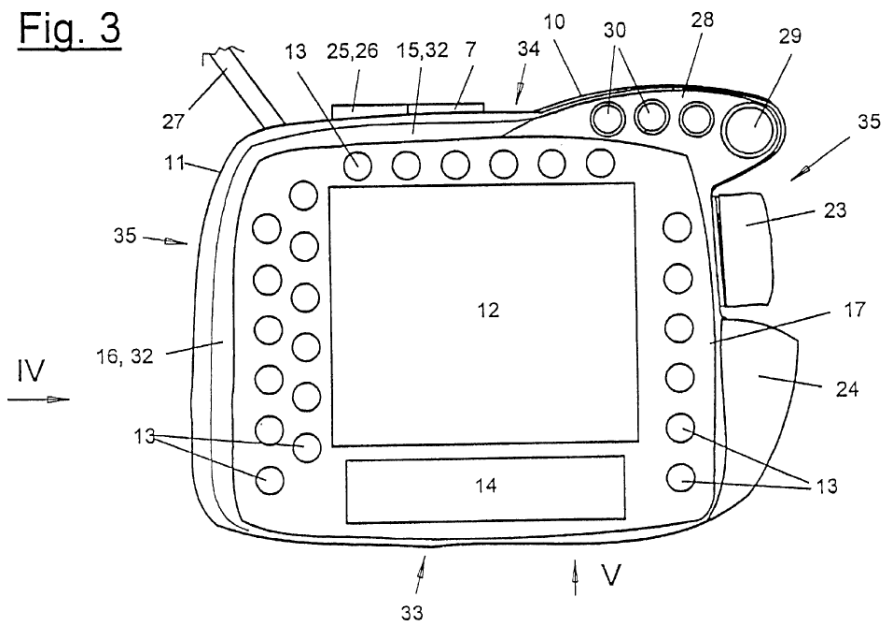


Figure 3 is a top view of the programming device. *Id.* at 3:32–33. “The programming device (10) contains in its housing (11) a computing and control unit . . . with which control elements . . . can transmit control commands to the manipulator (2) and/or the manipulator control (3).” *Id.* at 3:62–66.

2. Discussion

Patent Owner asserts that Petitioner’s articulation for this ground is similar to The Handbook anticipation ground, arguing that “Petitioner’s analysis of Wörn omits any mention of whether the computational node ‘compris[es] programmable logic for implementing program controlled functions’” and that “Petitioner’s limited discussion does not even employ the term ‘programmable logic’ or attempt to identify any structure that satisfies that claim element.” Prelim. Resp. 15 (citing Pet. 74) (alteration in original). Patent Owner’s arguments in this regard are persuasive.

As mentioned above, independent claim 1 recites:

a computational node disposed on the physical interface, the computational node comprising programmable logic for implementing program controlled functions.

Ex. 1001, 19:33–35.

The discussion in the Petition for this limitation consists of two paragraphs. Pet. 74 (citing, *inter alia*, Ex. 1003 ¶¶ 215–216). In the first paragraph, Petitioner argues that “Wörn discloses a ‘computational node disposed on the physical interface.’” *Id.* In the second paragraph, Petitioner addresses the language “implementing program controlled functions” and argues that programming can be performed on programming device 10 (mapped to the physical interface). *See id.* Similar to Ground 1, the section of the Petition addressing the subject limitation for this Wörn ground does not contain the term “programmable logic” other than in the section heading and does not contain any discernable discussion of that aspect of the limitation. *See id.*; *cf. id.* at 81–83 (Petitioner arguing, for dependent claims 2 and 3, that *the programming device* (purportedly, the “physical interface”) implements the recited functions and algorithms whereas the claim calls for *the programmable logic* to implement those functions and algorithms). The cited paragraphs of the witness’s declaration also fail to provide an adequate explanation as to how Wörn discloses programmable logic. *See* Ex. 1003 ¶¶ 215–216. Accordingly, we determine that the Petition fails to address adequately the claims’ requirement that the multi-function hub have, on the physical interface, a “computational node comprising programmable logic for implementing program controlled functions.”

Petitioner has failed to make a threshold showing regarding the “programmable logic” limitation of independent claim 1. All of the remaining challenged claims in this ground depend from independent claim 1 and, therefore, also require the “programmable logic” limitation. We determine that Petitioner has failed to demonstrate a reasonable likelihood of prevailing on its challenge to claims 1–6, 9, 11–13, 17, and 18 as being anticipated by Wörn.

G. The Alleged Obviousness of Claims 1–6, 9, 11–13, 17, and 18 Over Wörn, Peshkin, and the Knowledge of a POSITA (Ground 5), and The Alleged Obviousness of Claims 33–35 and 37 Over Wörn, Peshkin, The Handbook, and the Knowledge of a POSITA (Ground 6)

Ground 5 challenges many of the same claims challenged in Ground 4 (anticipation by Wörn), including independent claim 1. Petitioner argues that Peshkin discloses an “intelligent assist system,” and maintains that, “[a]s shown in Ground 4, Wörn discloses all other aspects of the Challenged Claims.” Pet. 91

Ground 6 challenges certain dependent claims that do not recite “programmable logic.” *See id.* 92–95.

Petitioner, in its articulation of Grounds 5 and 6, does not address the “programmable logic” limitation. *See id.* at 91–95. Thus, neither Ground 5 nor Ground 6 remedies the flaw in Ground 4, and Petitioner has failed to demonstrate a reasonable likelihood of prevailing on its challenges of Grounds 5 and 6.

III. CONCLUSION

Petitioner has not demonstrated that there is a reasonable likelihood of establishing the unpatentability of any of claims 1–6, 9, 11–13, 17, 18, 33–35, and 37 of the ’317 patent.

IV. ORDER

For the foregoing reasons, it is

ORDERED that the Petition is *denied* and no trial is instituted.

IPR2022-00216
Patent 6,907,317 B2

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