

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PACKERS PLUS ENERGY SERVICES INC.,
Petitioner,

v.

BAKER HUGHES OILFIELD OPERATIONS, LLC,
Patent Owner.

Case IPR2016-01000
Patent 9,038,656 B2

Before MITCHELL G. WEATHERLY, BEVERLY M. BUNTING, and
ROBERT L. KINDER, *Administrative Patent Judges*.

BUNTING, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

Packers Plus Energy Services Inc., (“Petitioner”), filed a Petition pursuant to 35 U.S.C. §§ 311–319 requesting *inter partes* review of claims 1–17 (the “challenged claims”) of U.S. Patent No. 9,038,656 B2 (Ex. 1001, “the ’656 patent”). Paper 2 (“Pet.”). Baker Hughes Oilfield Operations, LLC (“Patent Owner”), did not file a Preliminary Response to the Petition. Upon consideration of the Petition, we determined that there was a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim, and instituted this trial, in pursuance to 35 U.S.C. § 314(a), as to claims 1–17 of the ’656 patent. Paper 11 (“Decision on Institution” or “Dec.”).

Subsequent to institution, Patent Owner filed a Patent Owner Response (Paper 15, “PO Resp.”), and Petitioner filed a Reply (Paper 19, “Reply”). Patent Owner requested a Sur-Reply, which was granted (Paper 21) and Patent Owner filed a Sur-Reply (Paper 24, “PO Sur-Reply”). A transcript of the oral hearing held on June 26, 2017 has been entered into the record as Paper 29 (“Tr.”).¹

This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we conclude that Petitioner has not demonstrated, by a preponderance of the evidence, that claims 1–17 of the ’656 patent are unpatentable.

¹ The oral hearings in IPR2016-01000 and IPR2016-01003 were consolidated. Paper 25.

II. BACKGROUND

A. Real Party in Interest

Petitioner names Packers Plus Energy Services Inc. as the real party in interest. Pet. 3. Patent Owner asserts that “[t]he real parties-in-interest in this proceeding are Baker Hughes Oilfield Operations, LLC; Baker Hughes, a GE Company, LLC; and Baker Hughes, a GE Company.” Paper 31, 1.

B. Related Proceedings

The parties indicate that the ’656 patent has been asserted in: *Baker Hughes Oilfield Operations, Inc. v. Packers Plus Energy Services Inc.*, Case No. 4:16-cv-00019, (S.D. Tex.). Pet. 3, Paper 6, 1. Additionally, Patent Owner identifies another petition challenging the patentability of the parent patent to the ’656 patent, U.S. Patent No. 8,261,761 B2 (IPR2016-01003). Paper 6, 1.

C. The ’656 Patent (Ex. 1001)

The ’656 patent issued May 26, 2015 from U.S. Patent Application No. 13/340,939 filed on December 30, 2011. Ex. 1001, (45), (21), (22). The ’656 patent is a division of application No. 12/437,412 filed May 7, 2009, now Pat. No. 8,261,761. *Id.* at (62).

The ’656 patent is directed to a restriction engaging system that includes “a restriction engager, one or more restrictions, and at least one counter configured to permit or prevent passage of a restriction engager through . . . one or more restrictions.” *Id.* at 1:43–46. The restriction engaging system is positioned within a borehole tubular or open hole, and the restriction engager sealing engages the restriction after having allowed a

predetermined number of restriction engagers to pass therethrough. *Id.* at 2:16–23. The seal creates a pressure differential in the borehole. *Id.* at 2:23–25. The restriction engaging system is illustrated in Figure 1, reproduced below.

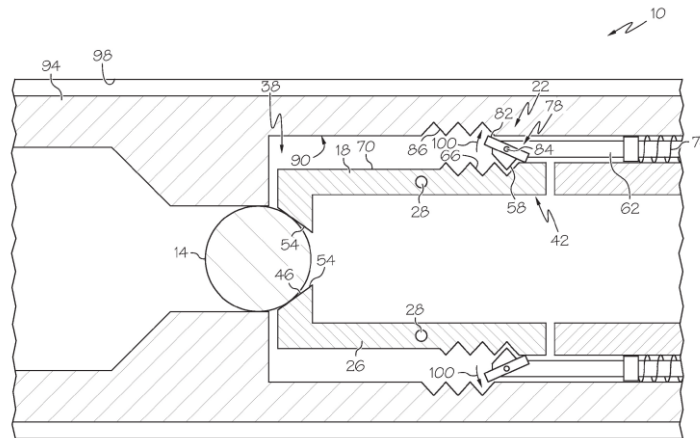


FIG. 1

Figure 1 is a cross sectional view of the system in a resting position.

Restriction engager or ball 14 is engageable within restriction 18. *Id.* at 2:31–35. Restriction 18 includes a plurality of pivot arms 26 that pivot between an impassable position and a passable position. *Id.* at 2:37–41. In the impassable position, the ends of pivot arms 26 “form a ring shaped continuous reduced dimension surface 46 with which the restriction engager 14 is engageable.” *Id.* at 2:42–46. In this example, movement of pivot arms 26 “is accomplished by urging a restriction engager therethrough with pressure.” *Id.* at 2:56–58. Each time one restriction engager 14 passes through restriction 18, counter 22 is indexed. *Id.* at 2:35–37. Movement of pivot arm 26 causes the second end 42 of the pivot arm to move radially inward, to disengage tooth 58 positioned on the end of ram 62 from opposed teeth located on an outer radial surface 70 of the second ends 42 of pivot arms 26, allowing ram 62 to move longitudinally. *Id.* at 2:62–3:3.

Escapement 78 limits the longitudinal movement of ram 62, and also assures that the tooth 58 will reengage with the next tooth 66 each time the pivot arms 26 return to the first pivot arm position. *Id.* at 3:4–14. The sequential indexing of tooth 58 along teeth 86 defines counter 22, and “the number of teeth **66** is selected to establish the number of restriction engagers **14** that the counter **22** will allow to pass the restriction **18**.” *Id.* at 3:30–32. Ram 62 continues to travel until contact is made with stop 104. *Id.* at 3:37–40.

In the embodiment shown in Figure 5, reproduced below, instead of using pivoting arms to cause the counter to index when a ball is forced through, a plurality of deformable arms 126 act in a similar manner. *Id.* at 3:54–67.

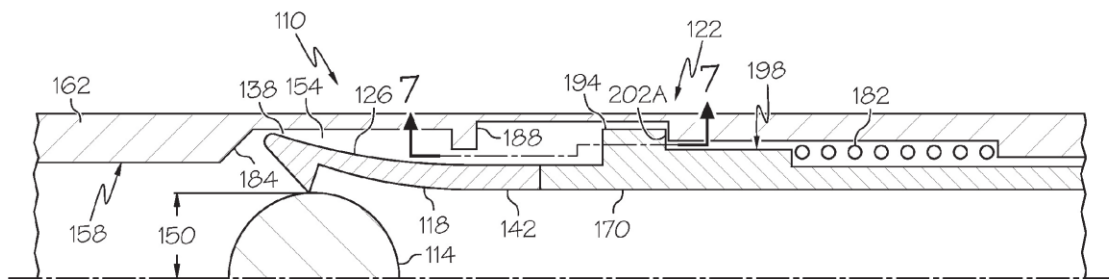


FIG. 5

Figure 5 is a cross sectional view of an alternate embodiment shown in the restrictor engager passing position.

Counter mechanism 122 uses rotationally indexable sleeve 170 that is longitudinally movable against biasing member 182, which “longitudinally biases sleeve **170** and deformable arms **126** in a direction wherein the nonrecessed portion **166** radially supports the deformable arms.” *Id.* at 4:22–24. Restriction 118 and sleeve 170 are longitudinally moveable in response to contact between restriction engager 114 and deformable arms 126, and provide a longitudinal urging against the restriction engager 114

and deformable arms 126 in response to the application of pressure. *Id.* at 4:24–28. After the restriction engager passes therethrough, biasing member 182 resets the sleeve and deformable arms back to the first deformable position. *Id.* at 4:28–31. Rotational stop surfaces 222 on the saw tooth surface 188 serve as an escapement 226 “to prevent rotation of the sleeve **170** beyond the next slot **186**” and assure indexing on one slot per passage of one restriction engager. *Id.* at 4:65–5:2.

D. Illustrative Claim

Challenged claim 1 is independent, and is illustrative of the challenged claims. Claim 1 is reproduced below:

1. A system, comprising:
 - one or more restriction engagers;
 - one or more restrictions; and
 - at least one counter configured to permit or prevent passage of a restriction engager through one of the one or more restrictions, the at least one counter configured to be responsively indexed each time one of the restriction engagers passes through the one of the one or more restrictions, the at least one counter preventing passage of an additional one of the restriction engagers after a selected number of the restriction engagers have passed the one of the one or more restrictions.

Ex. 1001, 5:32–43.

E. Prior Art of Record

Petitioner relies on the following reference:

References	Patents	Date	Exhibits
Howell	U.S. Patent Publication No. 2009/0308588 A1	Dec. 17, 2009	1005

Additionally, Petitioner relies on the Declaration of George H. Medley, P.E. (Ex. 1003), and Patent Owner relies on the Declaration of Glen Stevick, Ph. D (Ex. 2001). The parties rely on other exhibits as discussed below.

F. Instituted Ground of Unpatentability

We instituted the instant trial based on the following ground of unpatentability (Dec. 15):

Reference(s)	Basis	Claims Challenged
Howell	§ 102	1–17

III. ANALYSIS

A. 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) (citation omitted). In that regard, Petitioner’s expert, Mr. George H. Medley, testifies

a person of ordinary skill in the art in this field (“POSITA”) at the relevant time frame would have had a combination of experience and education in the oil and gas industry. This typically would consist of a minimum of a bachelor of science in civil, mechanical, electrical or petroleum engineering and three to five years of professional experience in hydrocarbon recovery.

Ex. 1003 ¶ 14.

Dr. Glen Stevick, Patent Owner's expert, generally agrees with Mr. Medley that a POSITA would have combined experience in the oil and gas industry and three to five years of experience in hydrocarbon recovery. Ex. 2001 ¶ 20. *See also* PO Resp. 46. Dr. Stevick further testifies that as to tools, the POSITA would not have been skilled in tool design and engineering. PO Resp. 47 (citing Ex. 2001 ¶¶ 67–68). Instead, the POSITA would have had “a basic functional understanding of how tools were intended to function, and would have specified such tools for inclusion in tool strings based on instructions from tool vendors rather than specifying specific structural characteristics of such tools.” Ex. 2001 ¶ 21 (citing Ex. 2003, 145:20–24).

Based on the evidence before us, we do not observe meaningful differences between the parties' assessments of a person with ordinary skill in the art in terms of education and experience. Indeed, the parties' disagreement centers on whether the POSITA would additionally have had an understanding of how the tools for downhole wellbore equipment are intended to function. PO Resp. 46–49; Pet. Reply 12–13. Given the high level of skill in the art, Patent Owner's argument that such a POSITA would not have such understanding of tool function is not persuasive. PO Resp. 46–47. Therefore, we are more persuaded by Mr. Medley's broader assessment of a person with ordinary skill in the art. As such, for purposes of this Decision, we determine that the POSITA would have (1) a bachelor of science in civil, mechanical, electrical or petroleum engineering and (2) three to five years of experience in hydrocarbon recovery in the oil and gas industry, including a familiarity with the function of downhole wellbore

equipment. We note that our analysis would be the same under either proposed definition.

B. Claim Construction

The Board interprets claims of an unexpired patent using the broadest reasonable interpretation in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b); *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1278 (Fed. Cir. 2015) (“We conclude that Congress implicitly approved the broadest reasonable interpretation standard in enacting the AIA”), *aff’d*, *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131 (S. Ct. 2016); Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012). Under the broadest reasonable interpretation standard, and absent any special definitions, claims terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech. Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

Petitioner proposes a construction for the claim terms “moves longitudinally,” “restriction engager,” “restriction,” and “operable communication.” Pet. 6–8. In turn, Patent Owner proposes a construction for “counter.” PO Resp. 22–28. For purposes of this Decision, having considered the evidence presented, we determine that only the claim term “counter” needs to be addressed, and only to determine whether the term is subject to 35 U.S.C. § 112 ¶ 6 (pre-AIA). *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy”).

Claim 1 requires

at least one counter configured to permit or prevent passage of a restriction engager through one of the one or more restrictions, the at least one counter configured to be responsively indexed each time one of the restriction engagers passes through the one of the one or more restrictions, the at least one counter preventing passage of an additional one of the restriction engagers after a selected number of the restriction engagers have passed the one of the one or more restrictions.

Ex. 1001, 5:35–43 (hereafter “counter limitation”).

Patent Owner contends the counter limitation should be construed in means-plus-function format pursuant to 35 U.S.C. § 112 ¶ 6. PO Resp. 22–28. Patent Owner acknowledges that a presumption exists that the counter limitation is not in means-plus-function format, yet Patent Owner contends the counter limitation would not be understood by a person of ordinary skill in the art as reciting any definite structure for performing the required function. *Id.* at 22. Patent Owner’s contention is supported by the testimony of Dr. Stevick, who explains that “‘counter’ was not used in the hydrocarbon recovery industry prior to the invention date to refer to any definite type of structure or class of structures.” *Id.* at 23 (citing Ex. 2001 ¶¶ 42–45; Ex. 2003, 75:23–76:4, 76:17–19, 78:18–19, 79:12, 80:5–7). According to Patent Owner, “there is no ‘definite structure’ denoted by the term ‘counter’; it is merely a function to be performed by any suitable structure,” and thus “‘counter’ is analogous to a ‘means for counting’ and should be subject to § 112, ¶ 6.” *Id.* at 24; PO Sur-reply 1–5.

Petitioner disagrees that the counter limitation should be construed in means-plus-function format. Pet. Reply 3–10. Petitioner contends that the prior art of record “show[s] that a ‘counter’ conveys particular structure to [a] POSA.” *Id.* at 3. Petitioner argues that simply alleging that a counter is functional is not sufficient because a counter conveys a certain class of

structures, specifically, “the term ‘counter’ conveys a particular class of structures that, just as the name implies, ‘count’ the number of balls that pass through the assembly, and either indexes and allows the ball to pass (*i.e.*, keeps the restriction/ball seat open), or stops it (*i.e.*, locks movement of the restriction/ball seat).” *Id.* at 5.

Based on the final trial record before us, we are not convinced that the counter limitation should be construed as a means-plus-function term. Because the term “means” is not used, there is a presumption that the counter limitation is not subject to § 112 ¶ 6 and this presumption has not been overcome. Significantly, this presumption is overcome when “the claim term fails to ‘recite sufficiently definite structure’ or else recites ‘function without reciting sufficient structure for performing that function.’” *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349 (Fed. Cir. 2015) (*en banc*) (quoting *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000)).

Claim 1 recites “at least one counter configured to permit or prevent passage of a restriction engager through one of the one or more restrictions.” Ex. 1001, 5:35–37. The dependent claims further suggest that the counter is a definite structure that is configured to interact with another structure. For example, claim 2, which depends from claim 1, clarifies that the restriction engager is a ball. *Id.* at 5:44–45.

Turning to the Specification of the ’656 patent, a restriction engaging system is described that “includes, a restriction engager, one or more restrictions, and at least one counter configured to permit or prevent passage of a restriction engager through one of the one or more restrictions.” *Id.* at 1:43–46. The counter is identified in one embodiment as counter 22 configured to index each time restriction engagers 14 pass through the

restriction 18. *Id.* at 2:35–37 (describing the embodiment of Figures 1 and 2), *id.* at 3:59–60 (describing the embodiment of Figures 5 and 6). The Specification identifies the counter as a defined structure that is capable of performing certain functions as described in the Specification and also claimed. Based on our understanding of the Specification, the counter 22 is referred to as a structural element that “counts” the number of balls that passes through the assembly and either indexes and allows the ball to pass or stops the ball. Our understanding is confirmed by Dr. Stevick, who testified upon cross examination that “[c]ounters are often definite mechanisms, but it’s such a broad term, that without the specification and drawings, it doesn’t mean much.” Ex. 1020, 69:13–16.

Given the use of the term “counter” in the Specification and claims, a person of ordinary skill in the art would understand the counter limitation to recite sufficiently definite structure. Based on the final trial record before us, at the time of filing of the ’656 patent, a person of ordinary skill in the art would understand that the term “counter” was meant to convey a sufficiently definite structure such that the presumption against reading “counter” as a means-plus-function element is un rebutted.

C. Anticipation By Howell

Petitioner asserts that claims 1–17 are anticipated by Howell under 35 U.S.C. § 102. Pet. 5, 21. Petitioner provides explanations to account for all of the claim limitations recited in the challenged claims (*id.* at 21–57). Patent Owner argues that Howell cannot anticipate because (1) it is not enabled and (2) does not disclose the structural equivalent of the “counter limitation.” PO Resp. 1.

We have reviewed the parties' contentions and supporting evidence. For the reasons given below, we conclude that Petitioner has not demonstrated by a preponderance of the evidence that the challenged claims would be anticipated by Howell.

As a threshold initial matter, we address Patent Owner's argument that the disclosure of Howell is not enabling, and therefore does not anticipate the challenged claims. PO Resp. 45–49. To anticipate a claimed invention, a prior art reference must enable one of ordinary skill in the art to make the prior invention without undue experimentation. *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1354 (Fed. Cir. 2003). At the same time, the burden of persuasion in an inter partes review is on the petitioner to prove unpatentability by a preponderance of the evidence, and this burden does not shift to the Patent Owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378–80 (Fed. Cir. 2015). This includes the burden of establishing that any reference upon which petitioner relies constitutes prior art under 35 U.S.C. § 102. 35 U.S.C. § 316(e); see *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1576 (Fed. Cir. 1996) (holding that the challenger “bore the burden of persuasion . . . on all issues relating to the status of [the asserted reference] as prior art”). The distinct burden of production,² however, is a shifting burden, and the allocation of this burden depends upon where in the process of trial the issue arises. See *id.* at 1379

² The burden of production is also called the burden of going forward with evidence, which means both producing evidence and presenting persuasive argument based on the evidence. *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1327 (Fed. Cir. 2008).

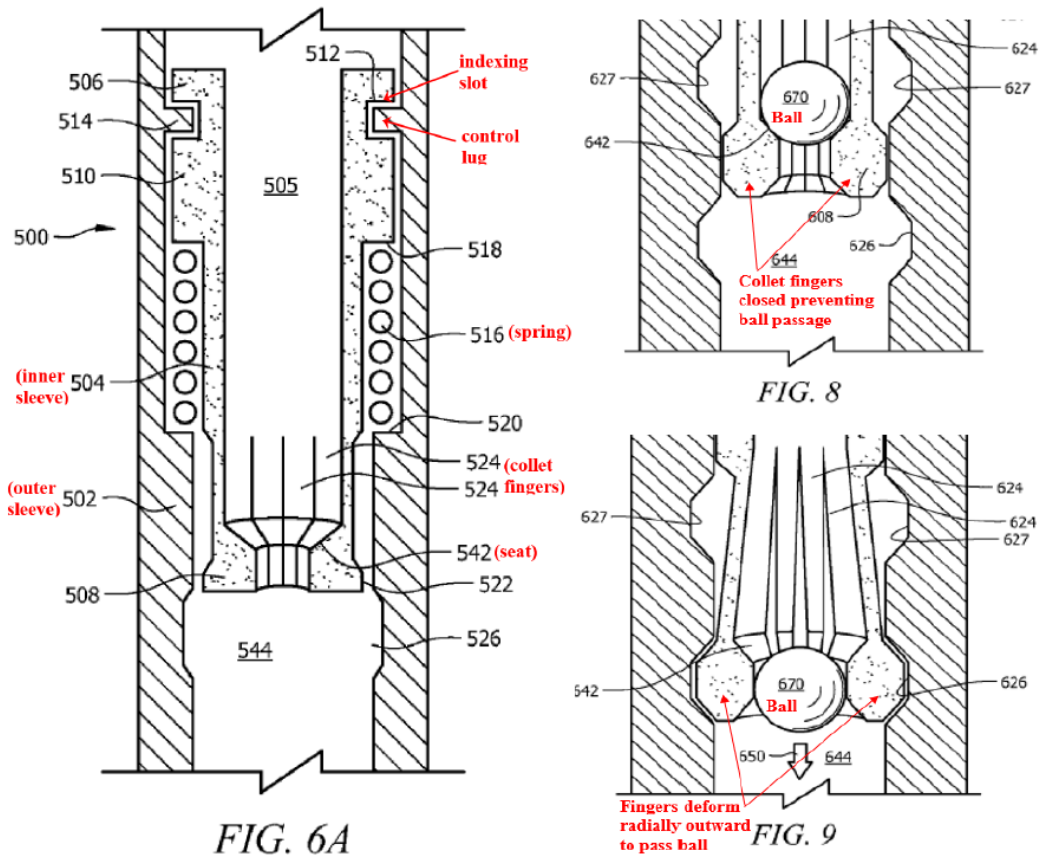
(citing. *Tech Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)). We begin our analysis with an overview of Howell.

1. Howell (Ex. 1005)

Howell relates to a “well bore servicing apparatus” designed to individually and selectively stimulate multiple “pay zones” — areas along the well bore that, when stimulated, cause natural gas or other desirable hydrocarbons to be released. Ex. 1005 ¶ 2. Howell discloses that having a tubing assembly with successively smaller diameter sleeves tends to restrict the inner diameter of the flow bore as well as the flow rates through the tubing string with the smaller diameter sleeves. *Id.* ¶ 5. Howell “includes embodiments for maintaining an increased or substantially uniform inner diameter of a treatment or completion assembly having stimulation sleeves, and for increasing the number of stimulation sleeves included in the treatment or completion assembly.” *Id.*

Howell addresses the problems using a combination of obturating members (balls), seats, and sliding sleeves to stimulate select regions. *Id.* ¶¶ 6, 7. A predetermined number of uniformly sized balls are selectively passed through a sleeve and an indexing assembly, with the goal of catching a final ball after the predetermined number of balls have passed. *Id.* ¶¶ 45, 46, 51. The final ball allows the sleeve assembly to be actuated. *Id.* ¶ 45. Howell describes the use of “counter mechanisms to count the number of balls that pass through the assemblies.” *Id.* ¶¶ 50, 53.

Petitioner provides annotated Figures 6A, 8, and 9, reproduced below, which depict Howell’s “indexing assembly 500” including a ball seat 542 formed of collet fingers 524. Pet. 28.



Annotated Figures 6A, 8, and 9 depict cross-sectional views of an indexing assembly. Pet. 28.

Howell describes an indexing slot 512, which is formed as part of inner sleeve 504, and control lug 514, which is formed as part of outer sleeve 502. Ex. 1005 ¶ 41. Counting occurs in response to relative movement between outer sleeve 502 and inner sleeve 504; for example, control lug 514 and indexing slot 512 are described in Howell as moving relative to each other to count the number of balls that pass through the indexing assembly 500 when pressure is applied to the topside of a seated ball. *Id.* at ¶ 42.

Figures 6A and 8 represent a “stop” or “reset” position of the indexing assembly where collet fingers 524 are closed to form ball seat 642. *Id.* at ¶ 43. When pressure is applied to the topside of seated ball 670, inner sleeve

504 moves downward relative to outer sleeve 502, thereby also moving collet fingers 608 down to a position where they are free to deform radially outward into recess 626. *Id.* Figure 9 illustrates the position in which collet fingers 524 have been deformed radially outward, and ball 670 is allowed to pass through the assembly. *Id.* Howell refers to this state as a “release” position of the indexing assembly. *Id.*

Howell describes the counter being controlled by lug 514 as it is guided through a number of sets of stop and release positions within indexing slot 512. *Id.* These stop and release positions are depicted in Figure 6B of Howell reproduced below. *Id.* ¶ 42.

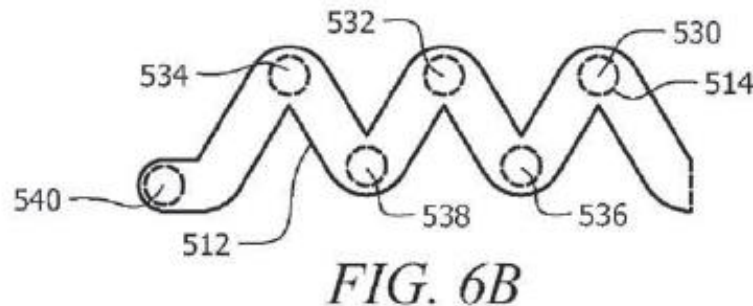
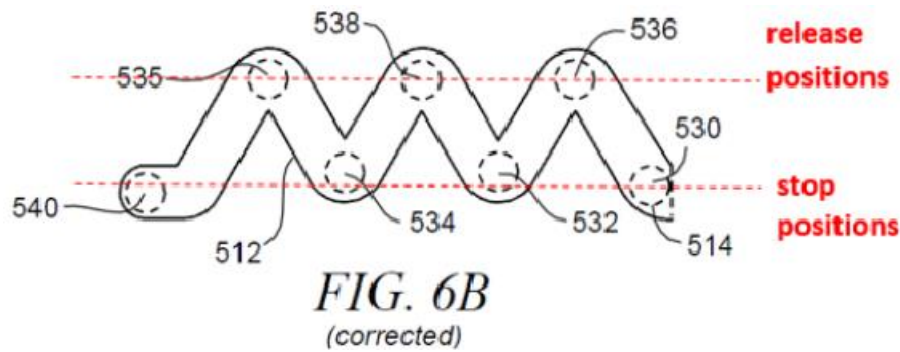


Figure 6B of Howell (Ex. 1005) represents “a profile view of an indexing slot of the indexing assembly of FIG. 6A.” *Id.* ¶ 19
Petitioner alleges that Figure 6B is drawn incorrectly and proposes a “corrected Figure 6B” to take its place as shown below. Pet. 29–30.



“Corrected” Figure 6B of Howell was created by Petitioner and it shows a top line of “release positions” and a bottom line of “stop positions.” Pet. 30.

Petitioner contends that Figure 6B, as depicted in Howell, is improperly drawn (*Id.* at 29), specifically that “the draftsman who drafted the figures of the ‘588 patent made a few mistakes in Fig. 6B, as explained in the declaration of George Medley, P.E. (Ex. 1003, Expert Dec. at 50-51).” *Id.* Mr. Medley opines that “a POSITA would have readily recognized that the draftsman misplaced several of the reference numerals, confusing ‘stop’ positions with ‘release’ positions.” *Id.* (citing Ex. 1003 ¶ 50). Patent Owner agrees that Figure 6B of Howell is improperly drawn, but Patent Owner views these errors as part of a larger problem with Howell’s ability to index and arrive at final stop position 540. See Tr. 38, 8–11 (“So, the error that’s there is a labeling error. It’s certainly symptomatic of a larger problem, in that Howell couldn’t figure out how to make a slot that actually works.”). We discuss the issues and the parties’ arguments with respect to Figure 6B in more detail below.

Paragraph 42 of Howell also explains that “[t]he indexing slot 512 may also be referred to as a continuous J-slot or a control groove.” Ex. 1005 ¶ 42. Referring to Figure 6B, Howell describes indexing slot 512 as including a plurality of reset or stop positions 530, 532, 534, as well as a plurality of release positions 536, 538 for lug 514 along the defined path. *Id.*

Howell states that “slot 512 also includes a final engagement or actuation position 540.” *Id.*; *see also id.* ¶ 44 (“The lug 514 is guided through any number of sets of stop and release positions until the lug 514 reaches the final position 540.”). Apart from these descriptions, Howell offers no further explanation as to how lug 514 would reach final stop position 540.

2. Enablement of Howell

Given that the cited prior art has a presumption of enablement, we recognize that the burden of rebutting enablement of a reference rests on Patent Owner. *See, e.g., In re Antor Media Corp.*, 689 F.3d 1282, 1289 (Fed. Cir. 2012) (“[D]uring patent prosecution, an examiner is entitled to reject claims as anticipated by a prior art publication or patent without conducting an inquiry into whether or not that prior art reference is enabling” and thereafter “the burden shifts to the applicant to submit rebuttal evidence of nonenablement.”). In the present proceeding, Patent Owner first raised the question of enablement of Howell in its Patent Owner Response. *See generally* PO Resp. 45–49. In turn, Petitioner disputes Patent Owner’s contentions in its Reply. *See generally* Pet. Reply 10–20. We granted Patent Owner the opportunity to file a sur-reply, which it did. *See generally* PO Sur-reply, 5–7. Thus, we apply the underlying principle from *Dynamic Drinkware* here: although the burden of persuasion to prove unpatentability always rests with petitioner, the burden of production for showing that a patent claim is unpatentable may shift between the parties. *See Tech. Licensing*, 545 F.3d at 1327–29 (explaining that the accused infringer/defendant, having the ultimate burden of proving its defense of invalidity, had the burden of going forward with evidence that there is anticipating prior art, and once the accused infringer met that burden, the

burden shifted to the patent owner to go forward with evidence that asserted claim is entitled to an earlier filing date); *id.* at 1327 (“This requires [patent owner] to show not only the existence of the earlier application, but why the written description in the earlier application supports the claim.”).

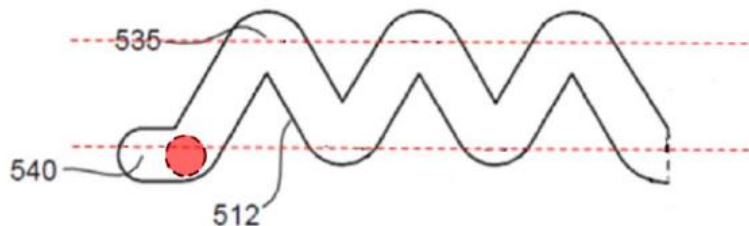
Based on the record before us, when viewed in light of *Dynamic Drinkware*, we find that Petitioner met its initial burden of production by relying on Howell and the supporting declaration of Mr. Medley, to support its argument that Howell discloses each of the limitations of the challenged claims. *See generally* Pet. 21–58. Indeed, our Decision on Institution confirms that Petitioner met its initial burden of production. Dec. 14. Because Petitioner offered Howell into evidence as prior art, and patent publications are presumed to be enabled,³ the burden of production then shifted to Patent Owner to come forward with evidence to demonstrate that the disclosure of Howell is not enabling — which it did in its Patent Owner Response.

We next consider the sufficiency of Patent Owner’s arguments and evidence that Howell is not enabled. Specifically, Patent Owner argues that Howell’s structure would not perform the functions recited in claim 1, including: (1) “prevent[ing] a ball from passing because it has no way of causing lug 514 to engage indexing slot 512 in final stop position 540” and (2) “count[ing] a ‘selected number’ of balls before preventing another ball from passing.” *Id.* at 46. Patent Owner details how the existing design of Howell could not accomplish these two functions. PO Resp. 28–36. Patent

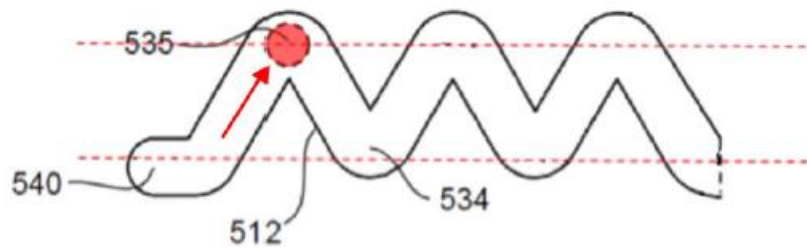
³ *See In re Antor Media Corp.*, 689 F.3d 1282, 1287–88 (Fed. Cir. 2012); *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1355 (Fed. Cir. 2003).

Owner, supported by the testimony of Dr. Stevick, contends that Howell's indexing assembly is incapable of preventing a ball from passing because lug 514 will never arrive at and maintain position 540. *Id.* at 30 (citing Ex. 2001 ¶¶ 57, 65–66). As explained and depicted by Patent Owner:

As shown in the diagram below, if the lug were able to progress to release position 535 and travel toward stop position 540, it would encounter a horizontal segment before it could arrive at stop position 540. *Id.* at ¶ 65. From that position, it would require a purely rotational motion of the sleeve for lug 514 to proceed to stop position 540. *Id.*



However, Howell describes no mechanism by which this motion could happen. *Id.* at ¶¶ 61, 65. The only way that Howell describes to achieve rotational motion of the sleeve is for lug 514 to engage the angled walls of slot 512. *Id.* This translates the linear, longitudinal forces imparted by the ball and spring into rotational motion. *Id.* at ¶¶ 53–54, 61, 65. However, when the lug engages the horizontal surface to the right of position 540, the longitudinal force can no longer cause rotational motion. *Id.* at ¶ 65. Angular momentum would *not* be adequate to cause lug 514 to move to position 540, because the masses and speeds in the downhole environment would not generate enough momentum to cause continued rotation after linear forces cease (and can no longer cause rotation). *Id.* at ¶ 59. Thus, absent any other motive force for rotational motion—and Howell describes none—there is no way that the Howell indexing assembly as described can arrive at a position in which a ball is prevented from passing. *Id.* at ¶ 65. Upon engagement of the next ball, the lug would simply move back to release position 535, as depicted in the diagram below. *Id.* at ¶ 66.



PO Resp. 30–31.

Additionally, Patent Owner explains that Howell’s indexing assembly fails to “allow passage of a ‘selected number’ of balls before preventing passage of another ball” because any backward step would enable passage of more than the “selected number” of balls. *Id.* at 31 (citing Ex. 2001 ¶¶ 54, 57–58). According to Patent Owner, the tool would backslide and not progress to the final stop position if the ball fails to travel the entire distance between a stop position and release position. *Id.* at 32 (citing Ex. 2001 ¶¶ 60–64). Based on the symmetry of Howell’s indexing slot, Patent Owner contends that backsliding is likely, as illustrated by Dr. Stevick in annotated Figure 6B, which is reproduced below. *Id.* (citing Ex. 2001 ¶¶ 58–64).

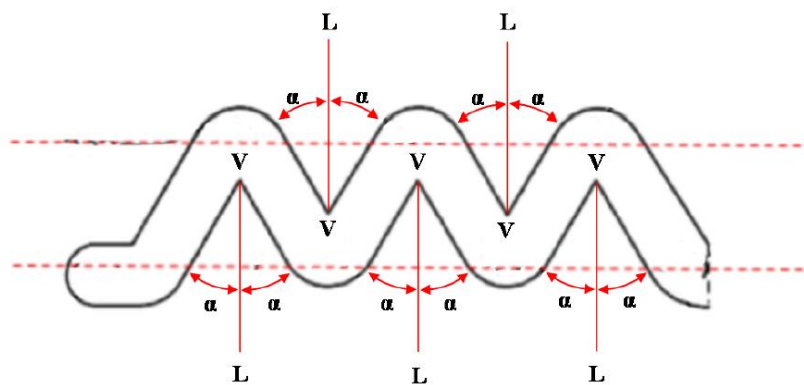


Figure 6B of Howell (Ex. 1005) as annotated by Patent Owner in red to show “backsliding” of the lug traveling through the indexing slot.

Patent Owner provides a detailed explanation and further annotations of Figure 6B to support this position. *Id.* at 33–36 (citing Ex. 2001 ¶¶ 58, 60–64).

Based on its view of Howell, Patent Owner also argues that redesign of Howell’s tool to function as intended⁴ “would at the very least have required undue experimentation.” *Id.* at 47 (citing Ex. 2001 ¶¶ 67-68). For example, Patent Owner notes that angling the horizontal segment adjacent final stop position 540 of the indexing slot to provide rotational movement would conflict with “Howell’s need to prevent further vertical movement of its inner sleeve.” *Id.* at 48 (citing Ex. 1005 ¶ 44; Ex. 2001 ¶ 67). Patent Owner’s expert opines that “[a]ngling that horizontal leg would necessarily permit the vertical movement—and backsliding—that Howell sought to preclude.” *Id.* (citing Ex. 2001 at ¶ 67). Patent Owner notes that during cross-examination, Petitioner’s expert, Mr. Medley, could not “articulate what aspects of Howell’s structure would cause its inner sleeve to rotate (*id.* (citing Ex. 2003, 124:14–126:19; Ex. 2001 ¶ 68)); nor how Howell’s indexing slot could be modified to function as intended (*id.* (citing Ex. 2003, 128:17–129:7)).

In light of the arguments and evidence cited above, and as discussed below in response to Petitioner’s arguments, we find that Patent Owner has rebutted the presumption that Howell is enabling. Accordingly, the burden of production *shifts back to Petitioner* to establish by a preponderance of the evidence that the disclosure of Howell with respect to the challenged claims

⁴ We note that Petitioner has not proposed any specific redesign to Howell that would enable the indexing mechanism to function as intended.

is enabling. *See Dynamic Drinkware*, 800 F.3d at 1380. In *Dynamic Drinkware*, our reviewing court instructs:

In an *inter partes* review, the burden of persuasion is on the petitioner to prove “unpatentability by a preponderance of the evidence,” 35 U.S.C. § 316(e), and that burden never shifts to the patentee. Failure to prove the matter as required by the applicable standard means that the party with the burden of persuasion loses on that point—thus, if the fact trier of the issue is left uncertain, the party with the burden loses.

800 F3d at 1378–79 (internal citations omitted). We, therefore, turn to Petitioner’s evidence and arguments that Howell is enabled. *See* Pet. Reply. 10–20.

In its Reply, Petitioner counters that Howell is enabled, and that “it is Patent Owner’s burden to demonstrate non-enablement, and neither Patent Owner nor its expert even acknowledge the pertinent factors set forth in *In re Wands* to then attempt to show that POSA would need to engage in undue experimentation to practice Howell’s invention.” Pet. Reply 10–11 (citing *In re Wands* 858 F.2d 731, 737 (Fed. Cir. 1988.)) Petitioner maintains that “when the *Wands* factors are considered, they confirm Howell’s anticipating disclosure.”⁵ *Id.* at 11.

Bearing in mind that the burden of production has shifted to Petitioner to refute Patent Owner’s arguments and evidence that Howell is not enabled, we consider Petitioner’s arguments and evidence. We first consider

⁵ The *Wands* factors include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. *Wands* 858 F.2d at 737.

Petitioner's general contention that Patent Owner's enablement position should fail because Patent Owner does not expressly cite *In Re Wands* or Patent Owner does not present the enablement arguments in a coherent fashion. See Pet. Reply 10–11 (“neither Patent Owner nor its expert even acknowledge the pertinent factors set forth in *In re Wands*”); Tr. 7:11–8:3 (Petitioner contends that Patent Owner's enablement analysis is deficient “[b]ecause they don't present the analysis in -- in any kind of coherent fashion.”). We find Petitioner's contentions unpersuasive because a significant portion of Patent Owner's briefing is directed to the *Wands* factors, even though Patent Owner does not specifically provide a citation to the case itself. Considering the whole of Patent Owner's analysis, each of the *Wands* factors is addressed in some manner as we further explain below.

For example, Patent Owner's contentions first focus on establishing that Howell would not work as intended. PO Resp. 28–36. Patent Owner explains that based on the amount of direction presented, Howell's disclosed embodiments are not capable of functioning as intended and are thus not working examples. *Id.* at 28–30, 46 (“Howell's structure would not be able to perform the functions recited in claim 1 of the '656 Patent”). As for the predictability of the art, and undue experimentation, Patent Owner offers Dr. Stevick's testimony that the modifications necessary in Howell to achieve the intended function were not predictable and would require undue experimentation. See Ex. 2001 ¶¶ 51–69. Patent Owner also provides the detailed testimony of Petitioner's expert, Mr. Medley, to support its position that “a POSITA in 2008 would not have been able to modify Howell's structure to function as required by the claims,” thus addressing the quantity of experimentation necessary for Howell to operate as intended. PO Resp.

48 (citing Ex. 2003, 124:14–126:19; Ex. 2001 ¶¶68). Patent Owner contends that “despite studying Howell in enough detail to recognize that its Fig. 6B needed correction (see Ex. 1003 at ¶¶50-52), Mr. Medley did not even recognize that Howell’s structure would not function to “count” balls.” PO Resp. 48–49 (citing Ex. 2003 at 114:11–18).

Patent Owner’s analysis addresses the breadth of the claims and in particular

Howell must enable a counter configured to: ‘permit or prevent passage of a restriction engager through one of the one or more restrictions,’ ‘be responsively indexed each time one of the restriction engagers passes through the one or the one or more restrictions,’ and ‘prevent[] passage of an additional one of the restriction engagers after a selected number of the restriction engagers have passed the one of the one or more restrictions.

PO Sur-reply 5–6. Although we do not fully agree with Patent Owner’s assessment of the relative skill of those in the art, Patent Owner provides a detailed analysis of this hypothetical person and how the skill level would impact the enablement analysis. PO Resp. 46–47. As such, failing to name *In Re Wands*, and address the factors in order, does not negate Patent Owner’s detailed analysis, which considers the *Wands* factors.

Next, with respect to the state of the art and predictability of the art, we consider Petitioner’s argument that “the prior art is replete with examples of indexing mechanisms and J-slots that POSA would have been familiar with and would have referred to, if needed at all, to make and use Howell’s invention.” Pet. Reply 12 (citing Ex. 1012; Ex. 1014, 1:46–65; Ex. 1016, 1:18–30, 5:27-33; Ex. 1018, 3:11–17; Ex. 1020, 26:2–27:7, 57:2–59:4). Along this vein, Petitioner also asserts that the evidence it cites, namely Exhibits 1012, 1014, 1016, 1018, and 1020, “show that POSA would have

been able to predictably implement a slotted, indexing mechanism, but it also shows that the art was laden with numerous patents and other printed publications providing POSA with guidance on making and using the same.”

Id. As to the level of skill in the art,⁶ Petitioner asserts that slotted mechanisms are ubiquitous, and that “the POSA surely would not be confused about how to design the pertinent tool.” *Id.* at 13. Petitioner concludes that its “evidence of working slotted, indexing mechanisms disproves most, if not all” of the pertinent *Wands* factors. *Id.* (citing Ex. 1012; Ex. 1014, 1:46–65; Ex. 1016, 1:18–30, 5:27–33; Ex. 1018, 3:11–17; Ex. 1020, 26:2–27:7, 57:2–59:4).

The only evidence Petitioner produces to refute the testimony of Patent Owner’s expert, Dr. Stevick, regarding operation of the indexing mechanism disclosed by Howell are Exhibits 1012, 1014, 1016, and 1018. Moreover, Petitioner’s conclusory attorney arguments fail to provide a detailed explanation of the significance of the evidence relied on. *See* 37 C.F.R. § 42.104(b)(5). As such, we give little weight to Petitioner’s unsupported attorney arguments in this regard.

Both parties seemingly agree (Pet. 27, PO Resp. 10) that the following passage from Howell describes an indexing mechanism with an intended goal of achieving a final engagement or actuation position.

The indexing slot 512 may also be referred to as a continuous J-slot or a control groove. The indexing slot 512 includes a plurality of biased, reset or stop positions 530, 532, 534 and a plurality of release positions 536, 538 for the lug 514. The slot 512 also includes a final engagement or actuation position 540.

⁶ As discussed above, we adopted Petitioner’s definition of one of skill in the art.

Ex. 1005 ¶ 42.

The parties' dispute centers on whether the indexing mechanism shown in Figure 6B would be capable of achieving the intended goal. Petitioner argues that Patent Owner's "hyper-technical analysis" does not prove non-enablement of Howell and that the Figures in Howell cannot be relied on because they are not drawn to scale. Pet. Reply 13–14. Petitioner supports its argument by recapping Patent Owner's arguments (*Id.* at 14–15) and concluding that Patent Owner and Dr. Stevick improperly based their enablement argument "on specific angles, gaps, and pin sizes that are nowhere described in Howell." *Id.* at 16. Petitioner does not differentiate what aspects of the drawings, and in particular Figure 6B, can be relied upon despite Petitioner's own repeated reliance on Figure 6B to establish anticipation. Without more, Petitioner's attorney argument in this regard does not inform us how Patent Owner's arguments and evidence are incorrect.

Petitioner additionally argues that Patent Owner's analysis of Figure 6B is erroneous because "it does not account for the figures 'unwrapped or flattened profile view' that would eliminate the angled surfaces Dr. Stevick relies upon," and also ignores Howell's disclosure of biased stop positions and different pin shapes. Pet. Reply 16 (citing Ex. 1005 ¶ 42). Petitioner directs our attention to the cross-examination testimony of Dr. Stevick, in which Dr. Stevick agreed that "the flattened profile view will not show all dimensions or any depth-wise angle or curvature existing in Howell's indexing slot" (*id.* (citing Ex. 1020, 39:13 – 40:19)), as well as the above cited passage from Howell (*id.* (citing Ex. 1005 ¶ 42)). Nonetheless, other than asserting that Dr. Stevick's interpretation of Figure 6B is inaccurate,

Petitioner does not provide rebuttal evidence demonstrating that one of skill in the art would *disagree* with Dr. Stevick's testimony regarding Figure 6B. *See* Pet. Reply. 13–18.

Petitioner further argues that Dr. Stevick's analysis “fails to consider Howell's description of the indexing slot 512 being a ‘continuous J-slot’” (Pet. Reply 18 (citing Ex. 1020, 29:17–30:3)), despite the disclosure in Howell that “counting can be achieved with a J-slot” (*id.* (citing Ex. 1005 ¶ 27)). Petitioner's argument that Exhibit 1020 illustrates a J-slot is not persuasive because Petitioner does not provide credible evidence to support a finding that one of skill in the art would utilize the exemplary J-slot from Exhibit 1020 in the indexing mechanism of Figure 6B of Howell. More specifically, Petitioner's arguments and evidence do not establish persuasively how the J-slot of any exhibit it cites as evidence could be used to achieve a final stop position as claimed.

Moreover, even if we were to ignore Figure 6B and just consider whether the disclosure in Howell of utilizing a “continuous J-slot” is enabling—Petitioner has not proffered sufficient arguments and credible evidence to support a finding that a continuous J-slot will necessarily achieve the claimed function of preventing passage of an additional one of the restriction engagers after a selected number of the restriction engagers have passed. Indeed, continuous J-slots are that – they are continuous and do not reach a final stop position, and certainly not a final stop position as claimed. As one example, European Publication No. 0427422 B1, cited by the '656 patent (Ex. 1001 (56)), depicts endless (continuous) J-slot 182:

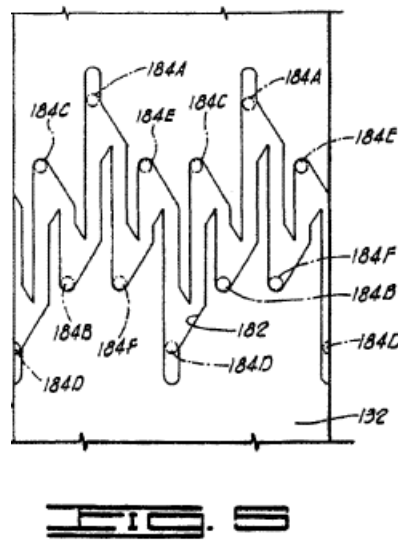


Figure 5 of European Publication No. 0427422 B1.
Ex. 1002, 215:22–45, 234.

Thus, Petitioner has not established how Howell’s disclosure of J-slots and continuous J-slots enable the claim requirement of achieving a final stop position. Further, to extent any modifications could be made to Howell or to any of the additional J-slot’s cited to achieve a final position as claimed without undue experimentation, these modifications have not been offered by Petitioner in the final trial record before us.

As to Patent Owner’s argument that Figure 6B is non-enabling because a purely rotational force is required for the lug to reach the final rest position 540, Petitioner argues that as shown in Figure 2 of Ex. 1018, “rotational movement, or a combination of rotational and up/down movement is the precise motion generated by a J-slot as explicitly defined in the art.” Pet. Reply 19. This argument is likewise unpersuasive because other than attorney argument, Petitioner does not proffer credible evidence to support a finding that one of skill in the art would equate the movement generated by the J-slot in Figure 2 of Exhibit 1018 with the movement of the lug in the indexing mechanism shown in Figure 6B of Howell, which as

Petitioner acknowledges, is not even a J-slot. *See* Tr. 20:18–21 (JUDGE BUNTING: And is the slot in figure 6B, is that -- would that be considered by one of skill in the art a J-slot? MR. MCKEOWN: No, it would not, your Honor.’’).

3. Summary

Considering the record as a whole, we find that Patent Owner has provided persuasive arguments and evidence demonstrating that the disclosure in Howell cited by Petitioner does not enable any of the claims of the ’656 patent. In response, Petitioner has not produced sufficient arguments and credible evidence to convince us otherwise. As such, the record shows sufficient evidence to overcome the presumption of enablement. We therefore conclude that Petitioner has not proven by a preponderance of the evidence that the challenged claims would be anticipated by Howell.

IV. CONCLUSION

Thus, based on our further review of the record, and for the foregoing reasons, Petitioner has not demonstrated, by a preponderance of the evidence, that claims 1–17 of the ’656 patent are anticipated under 35 U.S.C. § 102(b) by Howell.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–17 are held not to be unpatentable under 35 U.S.C. § 102(b) by Howell; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2016-01000
Patent 9,038,656 B2

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