

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ATHENA AUTOMATION LTD.,
Petitioner,

v.

HUSKY INJECTION MOLDING SYSTEMS LTD.,
Patent Owner.

Case IPR2013-00290
Patent 7,670,536 B2

Before JENNIFER S. BISK, MICHAEL J. FITZPATRICK, and
GEORGIANNA W. BRADEN, *Administrative Patent Judges*.

BISK, *Administrative Patent Judge*.

FINAL WRITTEN DECISION

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

I. INTRODUCTION

A. Background

Petitioner Athena Automation Ltd. filed a Petition (Paper 3, “Pet.”) to institute an *inter partes* review of claims 1–22 (“the challenged claims”) of U.S. Patent No. 7,670,536 B2 (Ex. 1001, “the ’536 patent”). 35 U.S.C. § 311. Patent Owner Husky Injection Molding Systems Ltd. filed a Preliminary Response. Paper 8 (“Prelim. Resp.”). On October 25, 2014, we instituted trial (Paper 18, “Decision to Institute” or “Dec. to Inst.”), concluding that Petitioner had shown a reasonable likelihood of showing that the challenged claims were unpatentable based on the following grounds:

Reference[s] ¹	Basis	Claims Challenged
Glaesener incorporating Choi	§ 102	1–7, 12, and 17–20
Glaesener and Choi	§ 103	8–11, 13–16, 21, and 22
Arend	§ 102	1, 4–16, 18, and 20–22

After institution of trial, Patent Owner filed a Response (Paper 24, “PO Resp.”) and a Motion to Amend claims contingent on any challenged claims being declared unpatentable (Paper 26, “Mot. to Amend”). Patent Owner also filed a Motion to Exclude Evidence. Paper 39 (“Mot. to Exclude”). Oral hearing was held July 22, 2014, a transcript of which appears in the record. Record of Oral Hearing, Paper 44 (“Tr.”).

¹ U.S. Patent Application 2004/0208950 (Ex. 1002) (“Glaesener”); U.S. Patent 5,753,153 (Ex. 1003) (“Choi”); U.S. Patent 5,417,913 (Ex. 1004) (“Arend”).

The Board has jurisdiction under 35 U.S.C. § 6(c). This final written decision, issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73, addresses issues and arguments raised in the post-institution briefing.

As discussed below, Petitioner has shown by a preponderance of evidence that claims 1, 4–16, 18, and 20–22 are unpatentable, but Petitioner has not shown by a preponderance of the evidence that claims 2, 3, 17, or 19 are unpatentable.

Patent Owner’s Motion to Amend claims is *denied*.

Patent Owner’s Motion to Exclude is *denied*.

B. Related Proceedings

The parties were involved in two other *inter partes* reviews based on patents claiming similar subject matter—IPR2013-00167 relating to claims of U.S. Patent No. 5,620,723 and IPR2013-00169 relating to claims of U.S. Patent No. 5,624,695. Each proceeding ended in a final written decision entered July 24, 2014. IPR2013-00167 (Paper 51); IPR2013-00169 (Paper 51).

C. The '536 Patent

The '536 patent is titled “Molding-System Clamp” and relates to injection molding machines that inject, under pressure, injectable molding material into a mold cavity. Ex. 1001, 8:8–10, 37–42, 63–66. The mold cavity is created by two halves of a mold, each mounted on a platen, closed against each other. *Id.* at 9:20–24, 57–61. Once closed, the mold is held in that position by a clamp assembly, and the two platens are secured by a locking mechanism. *Id.* at 8:37–42; 9:29–31; Figs. 2A, 2B.

The locking mechanism includes both a lock member associated with a rod and a complementary lock member associated with a platen. *Id.* at

Abstract. Once the two members of the locking mechanism are engaged (locked), clamp actuators apply a clamping force to keep the mold closed as it receives molding material under pressure. *Id.* at 8:39–42. This clamping force causes uneven load stresses on the platen. *Id.* at 13:42–45. Thus, some portions, or zones, of the platen receive less load stress in comparison to the stress experienced by other zones. *Id.* The uneven stress causes the platen to bend, or flex, more at some zones (relatively higher flex zones) relative to others (relatively lower flex zones). *Id.* Accordingly, the '536 Patent discloses engaging the two lock members at a position that is proximate to a relatively lower flex zone of the platen resulting in reduced wear associated with the teeth of the locking mechanisms. *Id.* at 13:55–67.

Figures 2A and 2B of the '536 patent, reproduced below, depict the clamp assembly of the molding system, according to one embodiment, in which the clamp assembly is placed in a mold opened position.

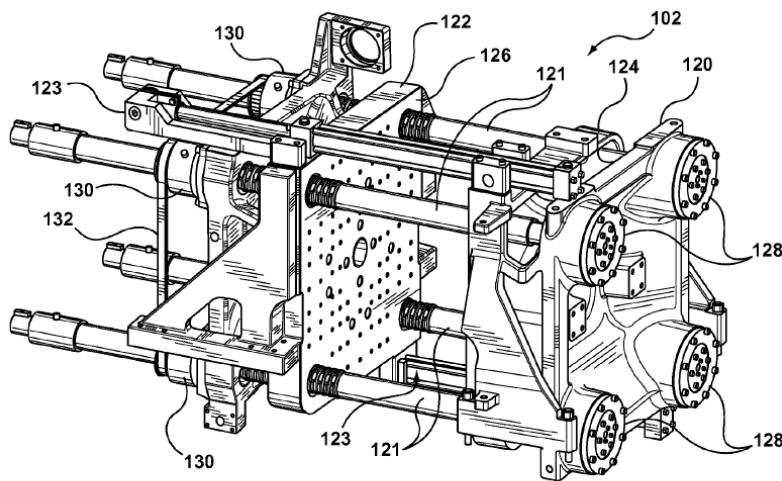


FIG. 2A

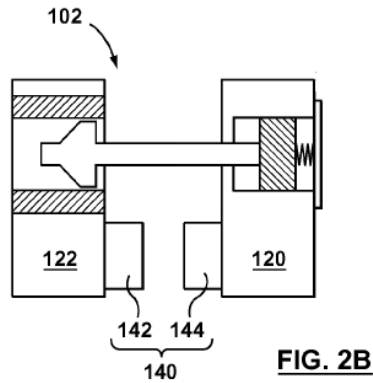


Figure 2A of the '536 Patent illustrates clamp assembly 102 in the mold opened position. Ex. 1001, 7:29–31. Clamp assembly 102 includes (i) stationary platen 120, (ii) movable platen 122, (iii) platen stroke actuators 123, (iv) clamp actuators 128, (v) rods 121, and (vi) tie-bar locking mechanisms 130. Figure 2A does not depict the mold. *Id.* at 8:62–63. Figure 2B depicts the clamp assembly of Figure 2A with mold portions 142 and 144 visible in the mold opened position—the mold portions are separated from each other. *Id.* at 8:58–62; 9:47–50.

Figure 8A of the '536 patent, reproduced below, depicts clamp actuator 128, also referred to as a clamp.

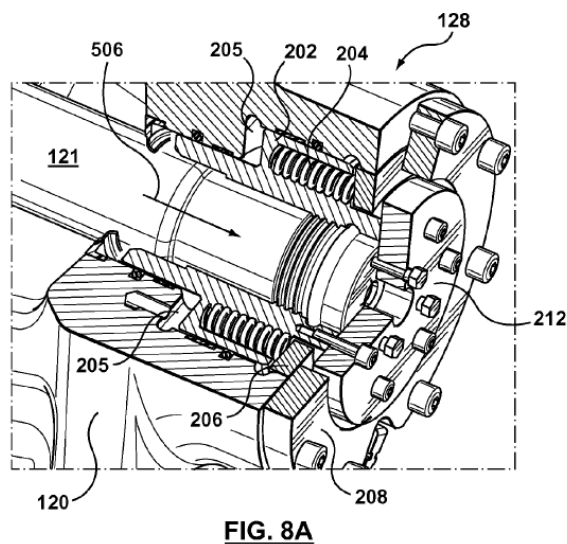


Figure 8A illustrates the clamp of clamp assembly 102. Ex. 1001, 7:51–52. The clamp is actuated so that clamping force 506 is applied to rod 121. *Id.* at 13:12–14.

The '536 patent provides a series of figures illustrating an exemplary embodiment of clamp assembly 102 at various times during the molding process. Each figure depicts positions of the two mold portions and clamp. Several of the figures explicitly show locking teeth 238 and 248 and whether the teeth are separated by a gap or not.

Figures 5C, 6C, and 7B are reproduced side-by-side below. In Figures 6C and 7B, teeth 238 are shown in yellow, and teeth 248 are shown in green (coloring added). The gap between the teeth, unlabeled in the original figure 6C, is shown in red, as annotated.

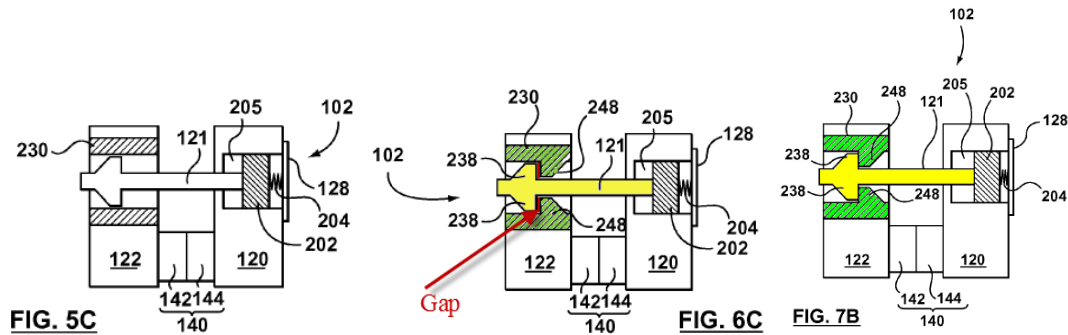


Figure 5C depicts the locking mechanism in an “unlocked condition.” *Id.* at 7:41–44. The mold portions are in the “mold closed position.” *Id.* at 12:32–36. Figure 6C depicts the locking mechanism in a “lockable condition.” *Id.* at 7:45–46. Mold portions 142, 144 are in the “mold closed position.” *Id.* 12:50–54. According to the '536 patent, “[t]he gap between the teeth 238 and the teeth 248 is clearly visible in this view.” *Id.* at 12:54–55.

Figure 7B depicts the clamp in a “gap closed condition.” *Id.* at 7:48–50. The “gap closed condition” is defined as the condition in which “(i) the

gap between the teeth 238, 248 has been taken up (that is, removed), and (ii) the teeth 238, 248 contact each other.” *Id.* 12:65–13:3. In addition, the locking mechanism is in the “locked condition” meaning that “platen 122 is no longer movable relative to the rod 121” and the fluid in chamber 205 is pressurized “sufficiently enough to push the piston 202 away from the platen 122.” *Id.* at 13:3–7. As a result, “rod 121 is pushed away from the platen 122 sufficiently enough to take up the gap between the teeth 238, 248” so that the teeth 238, 248 abut each other. *Id.* at 13:7–10. Spring 204 is compressed. *Id.* at 13:10–11.

In Figures 8B and 9B, reproduced side-by-side below, teeth 238 are shown in yellow, and teeth 248 are shown in green (coloring added).

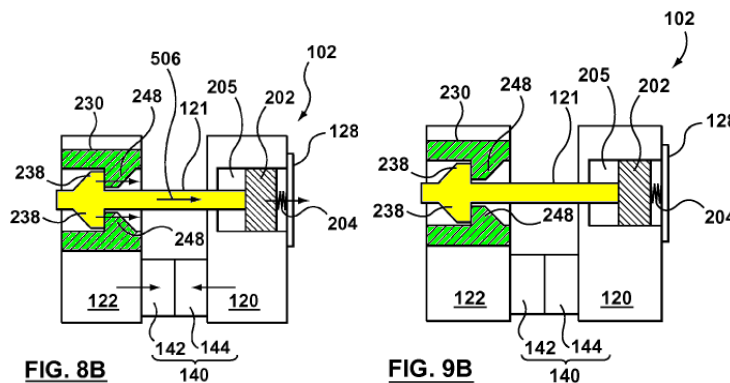
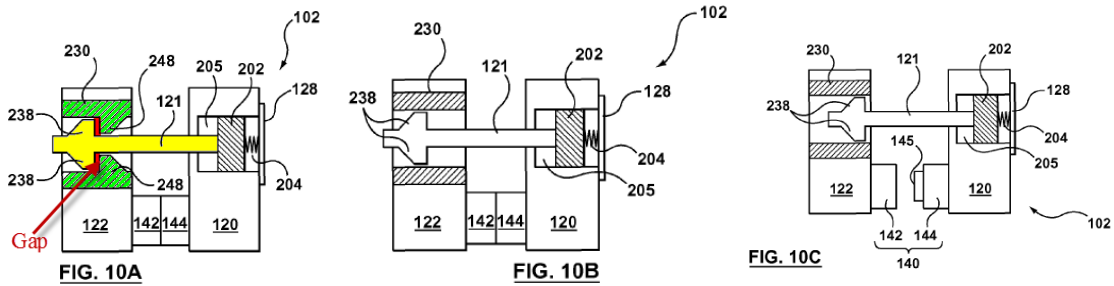


Figure 8B depicts an “actuated” clamp. *Id.* at 7:51–52. Mold portions 142 and 144 are in the “mold closed position” and the locking mechanism is in the “locked condition.” *Id.* at 13:28–30. In addition, “rod 121 is stretched as a result of transmitting the clamping force 506 to the platen 122.” *Id.* at 13:30–31. Figure 9B depicts the clamp in a “decompressed condition.” *Id.* at 7:56–58. Mold portions 142 and 144 are in the “mold closed position” and the locking mechanism is in the “locked condition.” *Id.* at 15:14–16. In this figure, “[t]he mold break force has not been applied.” *Id.* at 15:16–17.

Figures 10A, B, and C, reproduced side-by-side below, depict clamp assembly 102 in a “post mold break condition.” *Id.* at 7:59–61.



In Figure 10A, the locking mechanism is in the “lockable condition” and “[m]old break has occurred, and the teeth 248, 238 have become separated from each other so that, in effect, a gap exists between the teeth 248, 238.” *Id.* at 15:21–25. In Figure 10B, the locking mechanism is in the “unlocked condition” and “teeth 248, 238 have been rotated away from each other so they become misaligned relative to each other.” *Id.* at 15:26–32. Figure 10C depicts mold portions 142 and 144 once again in the “mold opened position” such that the molded article 145 may be removed from the mold cavity. *Id.* at 15:37–41.

Figure 8D of the ’536 Patent, reproduced below, depicts the lock in which the clamp is actuated.

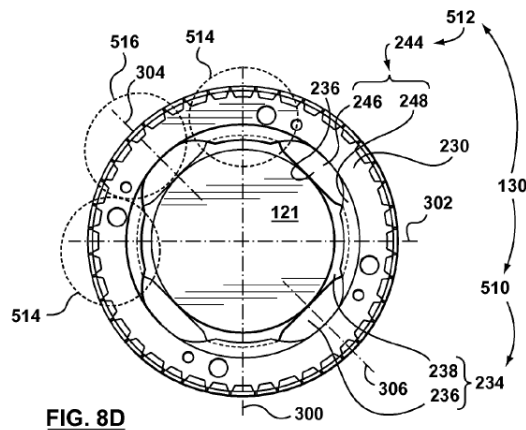


Figure 8D, above, illustrates an end view of the locking mechanism in which the lock is placed in the locked condition. *Id.* at 13:32–33. Rod 121 transmits the clamping force 506 across teeth 238 and 248. *Id.* at 13:38–40. Then the clamping force is transferred to platens 122 and 120 and ultimately to mold 140. *Id.* at 13:40–42.

The location of relative stress zones (514, 516) will depend on the structural supports of platen 122. *Id.* at 13:48–54. When the locking mechanism is actuated, teeth 238 and 248 become aligned at a position that is located proximate to a relatively lower flex zone 514. *Id.* at 13:55–60.

D. Illustrative Claims

Of the challenged claims, claims 1, 12, and 18 are independent. Claims 2–11 depend from claim 1, claims 13–17 depend from claim 12, and claims 19–22 depend from claim 18. Claims 1, 12, and 18, reproduced below, are illustrative of the claimed subject matter:

1. A lock of a molding system having a rod and a platen, the lock comprising:
 - a lock member associated with the rod that is movable between a clamped position and a released position by a clamp assembly; and
 - a complementary lock member associated with the platen; the lock member and the complementary lock member cooperatively operable to move between a lockable condition and an unlockable condition; wherein the complementary lock member is engagable with the lock member within a relatively lower flex zone of the platen;
 - the relatively lower flex zone of the platen being a portion of the platen adjacent to the rod and having a flex that is lower relative to a relatively higher flex zone of the platen also adjacent to the rod.

12. A molding system comprising:

a rod that is movable between a clamped position and a released position by a clamp assembly;

a platen;

a lock including:

a lock member associated with the rod; and

a complementary lock member associated with the platen of the molding system, the complementary lock member cooperatively operable to move between a lockable condition and an unlockable condition with the lock member, the complementary lock member being engagable with the lock member within a relatively lower flex zone of the platen;

the relatively lower flex zone of the platen being a portion of the platen adjacent to the rod and having a flex that is lower relative to a relatively higher flex zone of the platen also adjacent to the rod.

18. A method of actuating a lock of a molding system having a rod that is movable between a clamped position and a released position by a clamp assembly and a platen, the method comprising:

engaging a lock member associated with the rod with a complementary lock member associated with the platen at a position located proximate to a relatively lower flex zone of the platen;

the relatively lower flex zone of the platen being a portion of the platen adjacent to the rod and having a flex that is lower relative to a relatively higher flex zone of the platen also adjacent to the rod.

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012). Pursuant to that standard, claim 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).

For all claim terms not explicitly construed below, we apply the plain and ordinary meaning that the term would have had to a person of ordinary skill in the art, without further elaboration. 37 C.F.R. § 42.100(b).

1. “lock member” and “complementary lock member”

Each challenged claim requires “a lock member associated with the rod” and “a complementary lock member associated with the platen.” In the Decision to Institute, we construed “lock member” as encompassing a mechanism made up of at least one tooth structure and “complementary lock member” as encompassing a mechanism made up of at least one tooth structure that is engagable² with the tooth structure of the corresponding lock member. Dec. to Inst. 7–8. In its Response, Patent Owner generally agrees with these constructions, but “objects . . . to the Board’s claim constructions to the extent they may later be deemed to limit the terms . . . to only tooth structures.” PO Resp. 38–39. Because all prior art involved in this

² We adopt the spelling used in the claims.

proceeding involves tooth structures, we do not address further the scope of these terms.

2. *“rod that is movable between a clamped position and a released position by a clamp assembly”*

Each of the challenged claims requires “a rod” or “a lock member associated with the rod” “that is movable between a clamped position and a released position by a clamp assembly” (the “movable rod limitation”).³ The parties dispute the scope of this limitation. PO Resp. 18–34; Reply 1–5. In particular, to define the scope of this limitation, Patent Owner proposes constructions for several terms included in the limitation: “released position”; “clamped position”; and “rod that is movable.” PO Resp. 18–34. Petitioner, on the other hand, does not propose constructions for “released position” or “clamped position,” but asserts that Patent Owner’s construction of “movable,” and thus Patent Owner’s definition of the scope of the entire limitation, is both incorrect and irrelevant. Reply 1–5.

Although the parties frame their arguments differently, the crux of the dispute is whether the entire rod must be movable axially or whether mere stretching of the rod suffices. Patent Owner asserts that this claim limitation requires a rod that is displaced axially in its entirety when it transitions directly from an initial state (“released position”) to a final state (“clamped position”). Patent Owner defines the initial state as including: (1) the lock member and complementary lock member are aligned; (2) a gap exists between the teeth of the lock members; and (3) no clamping force is applied

³ Claim 1 requires “a lock member associated with the rod that is movable between a clamped position and a released position by a clamp assembly.” Claims 12 and 18 require “a rod that is movable between a clamped position and a released position by a clamp assembly.”

to the rod. PO Resp. 18–34. Patent Owner defines the final state as including: (1) the lock member and complementary lock member are aligned; (2) no gap exists in between the teeth of the lock members; and (3) clamping force is applied to the rod. *Id.*

Petitioner, on the other hand, asserts that the movable rod limitation is not so limited, but instead allows for several types of movement of the rod and may include potential intermediate states between the initial and final states. Petitioner appears to agree with Patent Owner’s description of the final state or “clamped position,” but argues that the movable rod limitation allows for an initial state in which either there is or is not a gap between the teeth of the lock members. According to Petitioner, the rod in the limitation may move between an initial state in which the gap is open and there is no clamping force (Patent Owner’s definition of “released position”) to an intermediate state in which the gap is closed and there is still no clamping force (the “gap closed position”). The rod may also move from the “gap closed position” to the final state, the “clamped position.” Petitioner argues that the “gap closed position” is also a “released position” because although there is no gap, no clamping force has yet been applied.

Both parties appear to agree that the rod moves between the “gap closed position” and the “clamped position” by stretching or contraction. Reply 3; Ex. 1011, 159:4–10, 166:15–18 (testimony of Patent Owner’s declarant); *see also* PO Resp. 24 (arguing that stretching of the rod happens simultaneously with axial displacement). In other words, when the clamping force is applied to the rod, the rod stretches. The dispute is whether this action—stretching of the rod in response to application of a clamping force—is encompassed by the movable rod limitation. According to Patent

Owner, “there is no evidence or disclosure from the ’536 patent that . . . the rod can stop at the gap closed position.” PO Resp. 28. Based on this, Patent Owner asserts that the stretching (or contraction) of the rod is not a separate operation from the translational movement of the rod, but instead happens at the same time and is an action not encompassed by the claim term. *Id.* at 27–28.

a. “released position”

As noted above, Patent Owner asserts that the term “released position” is “a condition in which the lock member and the complementary lock member are aligned and no clamping force is applied to the rod.” PO Resp. 18–19. This construction is supported by testimony of Patent Owner’s declarant. Ex. 2009 ¶ 32. Petitioner does not dispute this construction. Reply 3 (“[U]nder Patent Owner’s own construction of ‘released position,’ the gap-closed position is a released position because no clamping force is applied.”); Tr. 24:13–18 (Petitioner stating “there’s no dispute that release position is the condition in which no clamping force is applied.”).

The parties, however, dispute whether “released position” should include both a position where there is a gap between the teeth of the lock members and a position in which there is no gap. Patent Owner argues that “[y]ou can’t have two different release positions. That’s a term that’s not in the patent. Gap open released position is not in the patent.” Tr. 32:21–22. Petitioner asserts, however, that Patent Owner is ignoring the difference between the “gap closed” and the “clamped” positions. Reply 3.

The phrase “released position” is not used in the Specification except in the same context as that of the claim language. *See* Ex. 1001, Abstract (“The lock includes a lock member associated with the rod that is movable

between a clamped position and a released position by a clamp assembly.”). When describing an embodiment of the invention, the Specification uses the following position terms: “home position”; “force application position”; “mold open position”; “mold closed position”; “locked position”; and “unlocked position.” Of these terms, “home position” and “force application position” refer to whether a clamping force has been applied to the rod. *Id.* at 11:21–25 (“[R]od 121 is driven from: the home position (in which the clamp force is not applied to the rod 121) to the force application position (in which the clamp force is applied to the rod 121.”)); *see also* 9:62–67 (describing Figure 3 where “clamp 128 is placed in the home position in which a clamping force is not applied by the clamp 128 to: (i) the platen 120, and (ii) the platen 122 (via the rods 121)”). Patent Owner asserts that “released position” is synonymous with the “home position.” PO Resp. 19.

The Specification uses the term “release,” both in the context of spring 204 and the molded article, according to its plain and ordinary meaning. *See* www.merriam-webster.com (“release 1 : to set free from restraint . . .”); *see also* Ex. 1001, 10:20–29 (“[O]nce the first actuator 502 has been deactivated, the spring 204 *releases* its stored energy and pushes the first actuator 502 from the force application position toward the home position.”); 11:38–42 (“Responsive to depressurizing the chamber 205 with the relatively low amount of fluid pressure, energy that is stored in the spring 204 becomes *released* so that the spring 204 moves or pushes the piston 202 from the force application position back to the home position.”) (emphasis added); 15:9–11 (“[T]he molded article . . . may then be *released* and removed from the cavity defined by mold portions 142, 144.”) (emphasis added).

Consistent with both the plain and ordinary meaning of the word “released” and the Specification, we conclude that the broadest reasonable construction of “released position” is a condition in which no clamping force has been applied to the rod. Patent Owner has not pointed to persuasive evidence that the ’536 patent defines this term to be more limited. We are not persuaded, for example, that “released condition” requires that the lock members or the teeth be in a certain position relative to each other.

b. “clamped position”

Patent Owner asserts that the term “clamped position” is “a condition in which the lock member and the complementary lock member are aligned, and the clamping force is applied to the rod.” PO Resp. 19; *see also* Ex. 2009 ¶ 33. Petitioner does not appear to dispute this construction. *See* Reply 3. We adopt it as the broadest reasonable construction of this term.

c. “rod that is movable”

Patent Owner asserts that “rod that is movable” should be construed to mean “axial displacement of the entire rod.” PO Resp. 20; Ex. 2009 ¶ 35. Patent Owner relies on Figures 6C and 7B as demonstrating the axial movement of the rod and on the disclosure that “[t]he chamber 205 has been pressurized just enough to cause: (i) the rod 121 to move along direction 505 sufficiently enough so as to cause the teeth 238, 248 to abut each other, and (ii) but not enough to impart or apply the clamp force to the rod 121 and the platen 120.” PO Resp. 20–21 (quoting Ex. 1001, 12:59–64). Patent Owner also reviews the term “movable” as used in the prior art of record and finds that it is not inconsistent with this proposed construction. PO Resp. 22 (citing Ex. 2009 ¶ 101; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1317 (Fed. Cir. 2005) (en banc) (“The prosecution history . . . includes the prior art

cited during the examination of the patent.”)). Finally, Patent Owner asserts that the proposed construction is not inconsistent with dictionary definitions of the term “movable.” PO Resp. 21 (quoting Ex. 2008 (“movable . . . 2 a : capable of being moved : not fixed : not stationary <a device with a ~ attachment> : not restricted to one position or location.”)).

Petitioner argues that Patent Owner’s proposed construction “seeks to import extraneous limitations inconsistent with the ordinary meaning of ‘movable’ and the remaining claim language.” Reply 1. According to Petitioner, nothing in the Specification limits “rod that is movable” to axial displacement of the entire rod and that instead the term “movable” includes all the different forms of movement. Reply 2–4.

We agree with Petitioner. We are not persuaded that the ’536 patent limits the required movement of the “rod that is movable” to axial movement of the entire rod. For its proposed construction, Patent Owner relies on figures and description from the ’536 patent that are explicitly described as exemplary embodiment or embodiments. PO Resp. 21 (citing Ex. 1001, Fig. 6C, 7B, 8B, 12:59–64); PO Resp. 26 (citing Ex. 1001, Fig. 7A, 10:26–30, 13:30–37). The ’536 patent, however, clearly identifies Figure 7A (and the rest of the figures), as well as the corresponding description, as exemplary embodiments of the invention, stating explicitly that “[r]eference herein to details of the illustrated embodiments is not intended to limit the scope of the claims.” Ex. 1001, 16:4–8; *see also* 7:20–25. The testimony of Patent Owner’s declarant, George Markus, is based on these same portions of the ’536 patent that describe exemplary embodiments. Ex. 2009 ¶¶ 34–38.

Patent Owner does not, however, point us to any language of the '536 patent that evidences a clear intention to limit the claims to an exemplary embodiment. Thus, we are not persuaded that the language in the specification pointed to by Patent Owner limits the scope of the term at issue here. *See, e.g. Phillips*, 415 F.3d at 1323 (“[A]lthough the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments.”); *DSW v. Shoe Pavilion*, 537 F.3d 1342, 1348 (Fed. Cir. 2008) (“[W]hen claim language is broader than the preferred embodiment, it is well-settled that claims are not to be confined to that embodiment.”).

We are similarly unpersuaded by Patent Owner’s argument that Petitioner’s broader construction of the term “misapprehends the clamp assembly disclosed in the '536 patent in that it assumes that the stretching of the rod, upon application of clamping force (506), is a separate and distinct operation from the axial displacement of the rod by the spring; instead they happen substantially simultaneously.” PO Resp. 24, 27–28. Again, to support this assertion, Patent Owner relies on language of the '536 patent describing an exemplary embodiment, but does not point to any language indicating that the claims should be limited to this or any other aspect of the described embodiments. PO Resp. 27–28 (citing Ex. 1001 10:20–29); Ex. 2009 ¶¶ 39–41.

Another indication that the term “rod that is movable” was not meant to be limited as proposed by Patent Owner can be found in a comparison of

independent claim 1 and claim 3—a claim that depends from claim 1.⁴ Claim 1 recites “a lock member associated with the rod that is movable between a clamped position and a released position by a clamp assembly,” but does not expressly require a gap between the lock members. Claim 3 recites the lock of claim 1 and adds a limitation “wherein movement of the rod to the released position by the clamp assembly creates a gap between the lock member and the complementary lock member to reduce wear therebetween when they move between the lockable condition and the unlockable.”

Petitioner argues that because claim 3 specifies that movement of the rod creates a gap between the lock member and the complementary lock member, claim 1 must be broader and thus include both movement of the rod that both creates a gap and movement that does not create a gap. Pet. 15–16; Reply 4–5. According to Petitioner, the movement described in claim 1 must, therefore, include stretching as well as axial displacement. *See* Reply 3–5. Patent Owner disagrees, arguing that there is more than one limitation added by claim 3 and thus, claim differentiation does not apply. PO Resp. 28–31. Specifically, Patent Owner states that in addition to reciting a gap, claim 3 also requires a reduction of wear. *Id.* at 29–30.

We agree with Petitioner that the doctrine of claim differentiation supports the inference that claim 1 includes movement of the rod that both does create and does not create a gap. Otherwise, claim 3 would add nothing to claim 1 and the two would cover identical subject matter. *See*

⁴ The same comparison of claims could be made between independent claims 12 and 18 compared to dependent claims 17 and 19, respectively, as claims 17 and 19 add the same limitation as claim 3.

Phillips, 415 F.3d at 1314–15 (“[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.”). The language relied upon by Patent Owner as a separate additional limitation of claim 3, “to reduce wear therebetween,” merely describes the intended purpose of the claimed gap that adds nothing of substance to the recitation of the gap itself. *See Saunders Group, Inc. v Comfortrac, Inc.*, 492 F.3d 1326, 1331 (Fed. Cir. 2007) (holding that language in a dependent claim describing the operation of a seal is not itself a limitation distinguishing it from the independent claim from which it depends).

We conclude that the text of the ’536 patent and its prosecution history does not justify restricting the term “rod that is movable” to axial displacement of the entire rod.

d. Conclusion and Construction of the movable rod limitation

In summary, based on our construction of the terms “released position,” “clamped position,” and “rod that is movable,” we conclude that the limitation “rod that is movable between a clamped position and a released position by a clamp assembly” is not limited, as Patent Owner proposes, to a rod that is displaced axially in its entirety when it transitions directly from an initial state (“released position”) that contains a gap between lock member teeth to a final state (“clamped position”). Instead, we agree with Petitioner that the broadest reasonable construction of this limitation, in the context of the ’536 patent, includes other types of movement by the rod, including stretching. Moreover, the states between which the rod moves may include conditions where the lock member teeth

may or may not be separated by a gap. Because it is unnecessary for purposes of this decision, we do not address further the scope of these terms.

3. “*relatively lower flex zone*” and “*relatively higher flex zone*”

Each of the challenged claims requires a “relatively lower flex zone of the platen,” “the relatively lower flex zone of the platen being a portion of the platen adjacent to the rod and having a flex that is lower relative to a relatively higher flex zone of the platen also adjacent to the rod.” In the Decision to Institute, we construed “relatively lower flex zone” as “that portion of the platen that exhibits a lower flex, compared to the flex in any other portion of the platen, in response to the application of a clamping force on the platen.” Dec. to Inst. 10. Similarly, we construed “relatively higher flex zone” as “that portion of the platen that exhibits a higher flex, compared to the flex in any other portion of the platen, in response to the application of a clamping force on the platen.” *Id.* at 8–10.

In its Response, Patent Owner asserts that the proper construction of these terms is more limited. PO Resp. 34–38. In particular, Patent Owner asserts that “relatively lower flex zone” should include the restriction that the portion of the platen exhibiting lower flex must be “compared to the flex in *an adjacent zone* of the platen” as opposed to comparing it to the flex in *any other portion* of the platen. *Id.* at 38 (emphasis added). Similarly, Patent Owner asserts that “relatively higher flex zone” should include the restriction that the portion of the platen that exhibits a higher flex must be “compared to the flex in *an adjacent zone* of the platen . . . *wherein there is no alignment of the lock member and complementary lock member.*” PO Resp. 34–38 (emphases added).

Patent Owner asserts that its proposed construction is the broadest reasonable construction because the Specification discloses that: (1) “a relatively higher flex zone is always compared to a relatively lower flex zone that is adjacent to the higher flex zone” (*id.* at 38 (citing Figure 8D)); and (2) “there shall be no engagement of the lock member and complementary lock member in the relatively higher flex zone” (*id.* at 35 (citing Ex. 1001, 14:24–26)). Patent Owner adds that this proposed construction is consistent with one of the key objectives of the invention—“to reduce wear of the lock member and complementary lock member.” *Id.* at 36 (citing Ex. 1001, 13:63–14:1, 14:6–9, 14:47–53); *see also* Ex. 2009 ¶¶ 45–47 (Patent Owner’s declarant, Mr. Markus, testifying that only by comparing zones that are adjacent can the location of engagement of the teeth that will reduce wear be accurately pinpointed). According to Patent Owner, the ’536 patent “specifically disavows alignment of the lock member and the complementary lock member in a relatively higher flex zone.” *Id.* at 36–37.

We agree with Petitioner that Patent Owner’s proposed modifications improperly limit the claim terms. *See* Reply 6–9. Petitioner asserts, and we agree, that while the patent discloses that it is *preferable* to engage the lock member teeth in a lower flex zone, it does not restrict the invention to that situation. *Id.* at 7. For example, Mr. Markus admits that there is some benefit of reduced wear even if only some, but not all, of the teeth of the lock members engage in the relatively lower flex zone. *Id.* (citing deposition testimony of Patent Owner’s expert, Mr. Markus, Ex. 1011, 219:14–22, 222:2–12; 224:7–11, 225:12–25). Thus, a broader interpretation of the term “relatively higher flex zone” is also consistent with the ’536 patent’s stated

objection to reduce wear. Even more telling, the '536 patent itself states, in its description of an exemplary embodiment, “the complementary lock member 512 is lockably engaged with the lock member 510 at a position that is proximate, *at least in part*, to the zone 514.” Ex. 1001, 14:11–16 (emphasis added). We, therefore, are not persuaded that the '536 patent “specifically disavows” engagement outside the relatively higher flex zone, as asserted by Patent Owner. *See* PO Resp. 36–37. To the contrary, we are persuaded that the '536 patent explicitly contemplates that the teeth may, at least in part, *not* engage within the relatively higher flex zone.

We also agree with Petitioner that the claim language does not require comparison of *adjacent* flex zones. *Id.* (citing Ex. 1011, 227:10–24, 230:10–231:3). While the word adjacent is recited in the claims (e.g., “the relatively lower flex zone of the platen being a portion of the platen adjacent to the rod”) it refers to a flex zone being adjacent the rod, not another flex zone. *See* Ex. 1011, 227:10–24. Patent Owner’s reliance on Figure 8D as supporting the proposed restriction does not persuade us otherwise. As discussed above, Figure 8D describes an exemplary embodiment, and Patent Owner does not point to any language indicating that the claims should be limited to this embodiment. We also are not persuaded by Patent Owner’s unexplained and unsupported statement that “[o]nly by comparing zones that are adjacent, can such location of the engagement [in the lower flex zone] be accurately pinpointed.” PO Resp. 38 (citing Ex. 2009 ¶¶ 45–47).⁵

⁵ Although Patent Owner cites to three paragraphs of its proffered declaration as supporting this statement, the only testimony related to the premise is conclusory and does not support the assertion. Ex. 2009 ¶ 45 (“More specifically, because teeth are to engage in a low flex zone, it is necessary to compare adjacent zones (*i.e.*, possible locations of teeth) to

Thus, we decline to alter our preliminary construction of these terms and conclude that the broadest reasonable construction, in the context of the '536 patent, of “relatively lower flex zone” and “relatively higher flex zone” is as follows:

- 1) “relatively lower flex zone” is “that portion of the platen that exhibits a lower flex, compared to the flex in any other portion of the platen, in response to the application of a clamping force on the platen”; and
- 2) “relatively higher flex zone” is “that portion of the platen that exhibits a higher flex, compared to the flex in any other portion of the platen, in response to the application of a clamping force on the platen.”

4. *“engage within/proximate to a relatively lower flex zone*

Each of the challenged claims requires that “the complementary lock member is engagable with the lock member within a relatively lower flex zone of the platen” (“the engagement limitation”).⁶ In the Decision to Institute, we adopted a broadest reasonable construction of this term encompassing the situation in which the complementary lock member and the lock member are capable of interlocking or meshing at least in part within or proximate to a relatively lower flex zone of the platen. Dec. to Inst. 10–12. Neither party explicitly addresses the broadest reasonable

determine which is the relatively high flex zone and which is the relatively low flex zone.”). The other cited paragraphs are not related to the statement they are cited to support. *See id.* ¶¶ 46–47. Nor could we find, upon review of the complete declaration, any other support for Patent Owner’s assertion.

⁶ Independent claims 1 and 12 recite this limitation as quoted. Independent claim 18 includes a similar limitation, “engaging a lock member associated with the rod with a complementary lock member associated with the platen at a position located proximate to a relatively lower flex zone of the platen.”

construction of this claim term in their post-institution briefing. We conclude that no additional construction of the term is necessary.

5. “*biased*”

Neither party discusses the term “bias” in the claim construction section of its brief. *See* PO Resp. 18–39. This term, however, requires construction to resolve an issue in this proceeding. In the analysis of patentability, Patent Owner asserts that the term “biased” as used in claim 2, “is disclosed as being carried out by spring 204.” PO Resp. 48 (citing Ex. 1001, 10:20–30, Fig. 3). Petitioner argues that limiting the term to a spring, however, would be improper and “bias” should be given its ordinary and customary meaning, which in the context of the ’536 patent is “a tendency or bent to return to a particular position or condition.” Reply 11 (citing Ex. 1015, 110).

We agree with Petitioner that the term “biased” is not limited to being carried out by a spring. The ’536 patent explains that “the spring 204 biases the first actuator 502 toward the home position,” but this disclosure is prefaced by the phrase “[p]referably, the second actuator 504 includes a spring 204.” Ex. 1001, 10:20–30. In fact, the ’536 patent describes actuator 502 as actuated to move from the home position toward the force application position and “the second actuator 504 is used to move the first actuator 502 from the force application position to the home position once the first actuator 502 has been deactivated.” *Id.* at 10:8–19. This description does not require a spring to be used. Thus, we conclude that the term “biased” is not limited to being carried out by a spring.

B. Grounds Based on Glaesener/Choi

1. Overview of Glaesener (Ex. 1002)

Glaesener describes an injection molding machine with a platen having reinforcing ribs that cause the edges of the platen to bend less than they otherwise would when subjected to clamping forces. Ex. 1002, Abstract, ¶ 40.

Figure 5 of Glaesener is reproduced below.

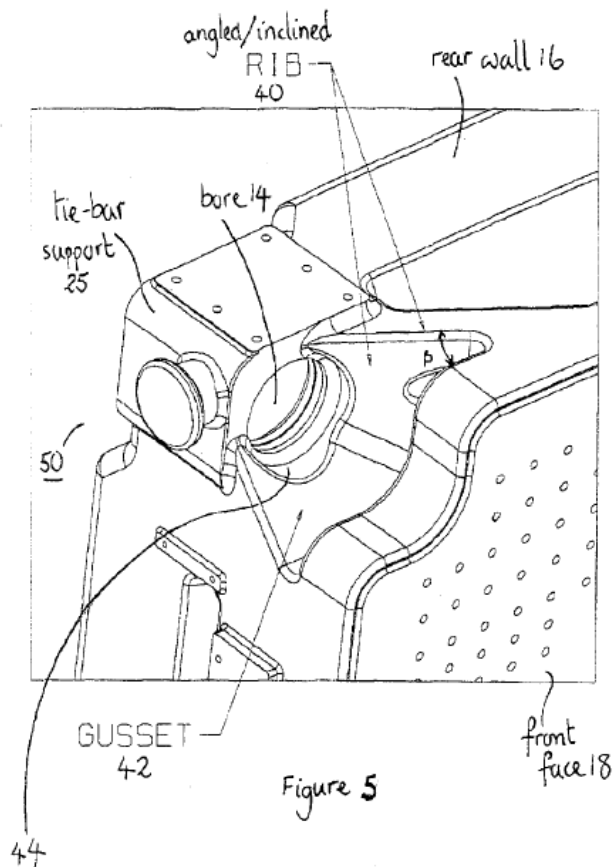


Figure 5, above, “is an enlarged perspective view of a corner of platen” 50. Ex. 1002 ¶ 33. Platen 50 includes “pairs of angled/inclined but straight ribs [40] located on at least two opposed sides of the platen.” *Id.* ¶ 38. According to Glaesener, this configuration of ribs 40 is desirable to ensure an even distribution of load to the platen during clamping. *Id.* Each angled rib 40 may be complemented by an angled support gusset 42 that extends

laterally outwardly from each angled rib and provides greater support of the platen edge. *Id.* ¶ 42.

Figure 2 of Glaesener is reproduced below.

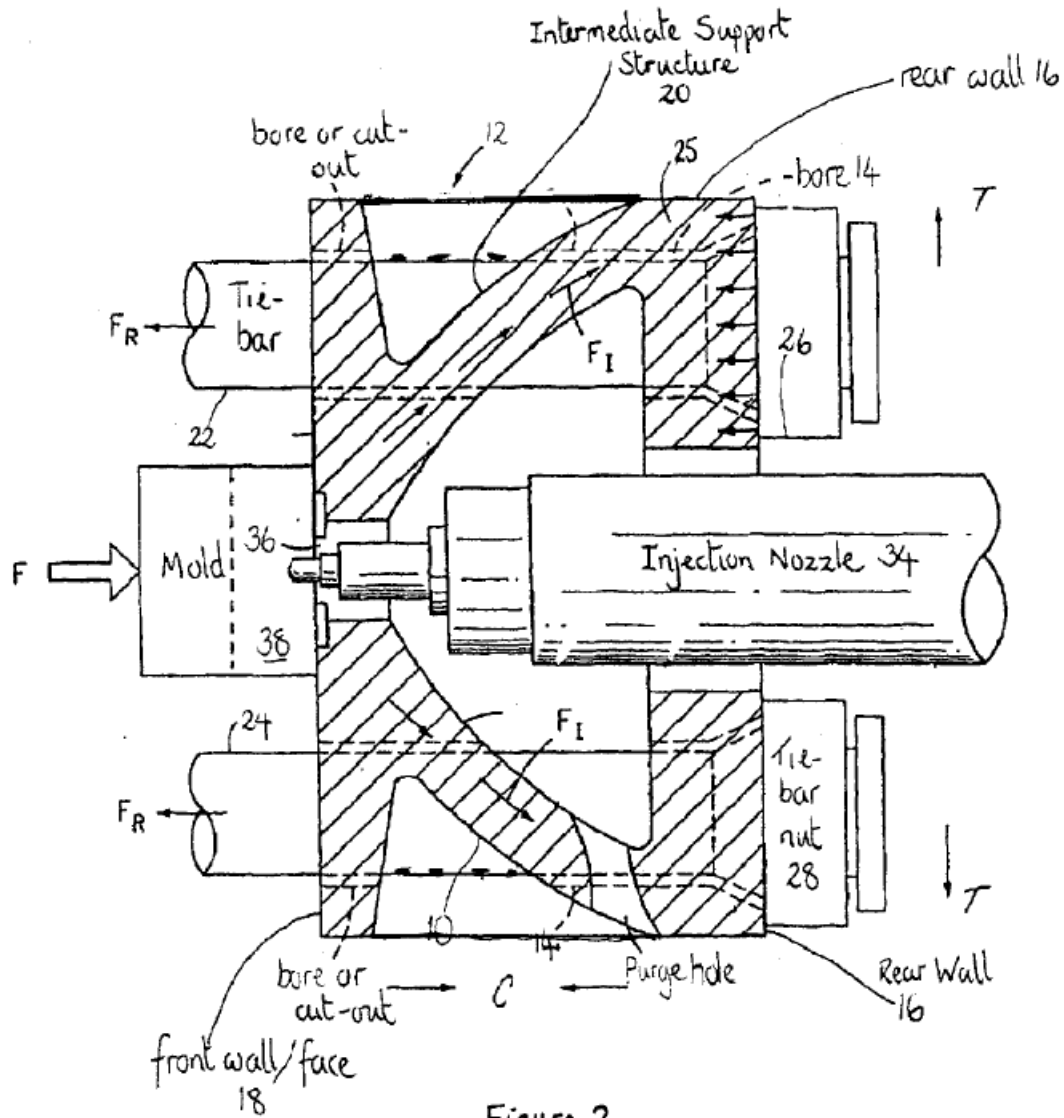


Figure 2 shows a sectional view of platen 12 in the context of a partial representation of an injection molding machine. Ex. 1002 ¶ 0034. Platen 12 is shown with front wall or front face 18 and a rear wall 16. *Id.* The two walls are coupled through intermediate support structure 20. *Id.* Tie bar pairs 22 and 24 are coupled to the rear wall 16 by tie-bar nuts 26 and 28.

Id. ¶ 0035. “The tie-bar nuts can be secured to the rear wall 16 by any appropriate mechanism, such as the pineapple and toothed-ring mechanism described in Choi [Ex. 1003].” *Id.*

2. Overview of Choi (Ex. 1003)

Choi discloses a clamping device for positioning and sustaining engagement of a movable mold platen on a carrier device relative to another platen. Ex. 1003, Abstract. Figure 3A of Choi is reproduced below.

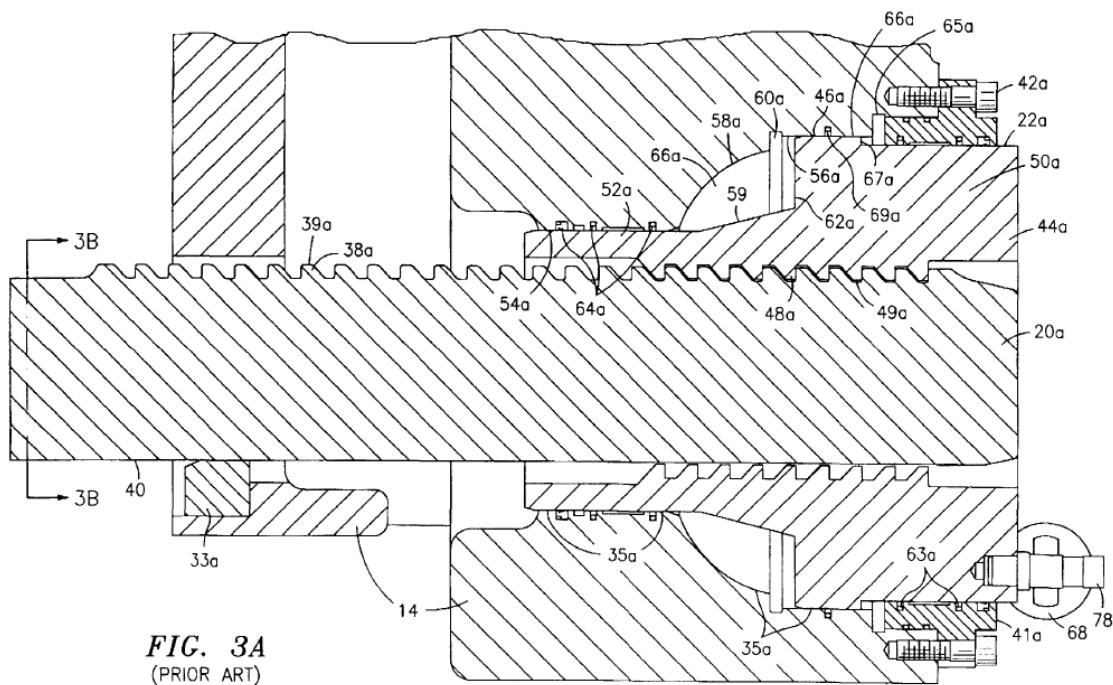


Figure 3A, above, is a cross-sectional view of the clamping assembly disclosed in Choi. Ex. 1003, 4:3–5. Tie bar 20a extends between the corners of movable platen 14 and a fixed platen 12 (not shown above). *Id.* at 4:63–67. Tie bar 20a includes an elongated end section with four strips 39 of teeth 38 on its outer surface. *Id.* at 5:42–53. Clamping assembly 22 includes piston 44 having an inner surface with four strips 49 of teeth 48, which are adapted to engage teeth 38. *Id.* at 5:59–6:1. A portion of Figure 4 of Choi is reproduced below.

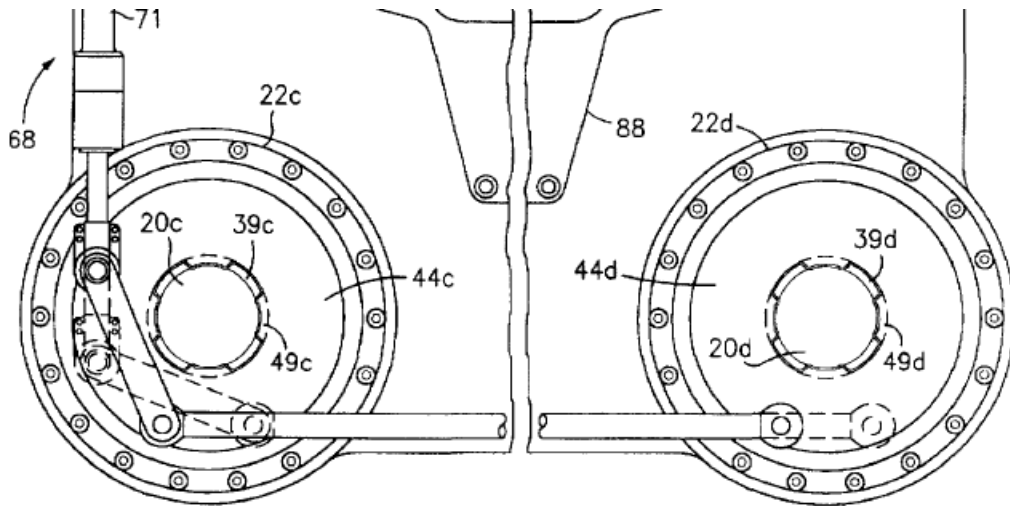


FIG. 4
(PRIOR ART)

The reproduced portion of Figure 4 of Choi, above, is the lower section of an end view of the injection molding machine showing the clamping assemblies and rotational mechanism. Ex. 1003, 4:6–9. The dotted lines in Figure 4 indicate movement of a rotational mechanism 68 that synchronously rotates the pistons 44 of the clamping assemblies 22 to bring the strips 49 of teeth 48 into alignment with the strips 39 of teeth 38 prior to the application of a clamping force on the platens 12 and 14. *Id.* at 7:53–8:9.

3. Incorporation of Choi

Petitioner asserts that Glaesener and Choi “can be considered together as a single prior art reference under 35 U.S.C. § 102(b) because Glaesener expressly incorporates Choi by reference.” Pet. 32 (citing Ex. 1002 ¶¶ 35, 49). In the Decision to Institute we agreed that the entirety of “Choi constitutes part of Glaesener for purposes of the anticipation analysis.” Dec. to Inst. 15 (citing *Harari v. Lee*, 656 F.3d 1331, 1334–35 (Fed. Cir. 2011)). Patent Owner argues that Petitioner has not met its burden to show that

Glaesener incorporates the entirety or even the relevant portions of Choi.
PO Resp. 40–44.

We do not reach the issue of what portions of Choi, if any, are incorporated by Glaesener, because even when considered as one reference, we determine below that Glaesener and Choi do not teach all the recited claim limitations in the same form and order as listed in the claims.

4. Anticipation: Claims 1–7, 12, and 17–20

“Because 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) (internal quotation marks omitted). Accordingly, an anticipatory reference must show all of the limitations of the claims “arranged or combined in the same way as recited in the claims.” *Id.* at 1370; *see Finisar Corp. v. DirectTV Group, Inc.*, 523 F.3d 1323, 1334–37 (Fed. Cir. 2008); *Ecolochem, Inc. v. Southern California Edison Co.*, 227 F.3d 1361 (Fed. Cir. 2000).

Petitioner asserts that Choi’s teeth 38 correspond to the claimed lock member, teeth 48 correspond to the claimed complementary lock member, and tie bar 20 corresponds to the claimed rod. Pet. 36. In addition, according to Petitioner, Choi’s securing/clamping assembly 22 corresponds to the claimed clamp assembly. *Id.* Petitioner reasons that these elements of Choi are part of the machine disclosed in Glaesener because of the following sentence: “The tie-bar nuts can be secured to the rear wall 16 by any appropriate mechanism, such as the pineapple and toothed-ring mechanism described in [Choi].” Pet. 25, 36. Petitioner, however, does not explain how

the relied upon elements of Choi's device secure the tie-bar nuts of Glaesener to rear wall 16 of Glaesener's platen. In fact, Petitioner does not direct us to any disclosure in Choi of tie-bar nuts or their equivalent. *See* Pet. 32–41.

Moreover, there is no dispute that Choi does not use the term “pineapple and toothed-ring mechanism.” Tr. 16:7–10. And Petitioner does not provide persuasive evidence as to what part of Choi is included in the term “pineapple and toothed-ring mechanism.” *See* Tr. 16:7–12 (arguing for the first time that what “pineapple and tooth mechanism” in Glaesener refers to is Figure 3A in Choi with no reference to the record); Tr. 60:14–22 (explaining that Petitioner does not provide evidence of what the pineapple and toothed-ring mechanism is).

Without such explanation and supporting evidence, we are not persuaded that Petitioner has met its burden to show that the various portions of Choi and Glaesener, on which it relies, are combined in the same way as recited in the challenged claims. *See Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984) (holding that although the prior art reference could be said to contain all of the elements of the claimed invention, it did not anticipate under 35 U.S.C. § 102 because it “disclose[d] an entirely different device, composed of parts distinct from those of the claimed invention, and operating in a different way to process different material differently.”). The Federal Circuit has expressly warned against treating patent “claims as mere catalogs of separate parts” without regard for the “part-to-part relationships set forth” therein. *NetMoneyIN*, 545 F.3d at 1370 (quoting *Lindemann*, 730 F.2d at 1459).

We conclude that Petitioner has not shown by a preponderance of the evidence that claims 1–7, 12, and 17–20 are anticipated by Glaesener, whether or not it incorporates Choi.

C. Obviousness: Claims 8–11, 13–16, 21, and 22

Petitioner asserts that dependent claims 8–11, 13–16, 21, and 22 would have been obvious over Glaesener and Choi. Pet. 42–44. These claims depend from independent claims 1, 12, or 18, and specify that the location of the relatively lower flex zone of the platen “is nominally located approximately” based on various clock positions in relation to the rod (“the clock claims”).

Petitioner does not assert that either Glaesener or Choi explicitly discloses where the relatively lower flex zone is located in terms of the positions of the clock recited by the challenged claims. Pet. 42–44. Instead, Petitioner asserts that skilled artisans knew that “platen distortion or flexure caused by clamping forces could cause undesirable wear between contacting parts.” Pet. 43 (citing Ex. 1002 ¶¶ 6, 8). Petitioner further asserts that this known problem, and Glaesener’s provided solution of stiffening ribs and gussets adjacent the tie bar “to reduce loading in the region of the tie-bar support” (Ex. 1002 ¶ 45), would have suggested the further improvement of rotating Choi’s tie bars and piston to place them in the claimed clock positions. Pet. 43. According to Petitioner, this orientation would engage lock members only within relatively lower flex zones and, therefore, would reduce stress and wear on all the lock members. Pet. 43–44. Thus, Petitioner concludes that a person of ordinary skill would have had a reason to make such modification. *Id.*

Patent Owner argues that there are two errors in Petitioner’s reasoning. PO Resp. 50–53. First, according to Patent Owner, because Glaesener is directed to a platen, Glaesener’s discussion of reducing the wear of certain parts cannot be extended to parts not disclosed by Glaesener, i.e., teeth of the locking mechanism. *Id.* at 51. Second, Patent Owner asserts that it does not automatically follow from Glaesener’s teaching of ribs and a gusset that one of ordinary skill in the art would know the further improvement of rotating Choi’s tie bars and pistons to ensure engagement of the teeth was within the relatively lower flex zone. *Id.* at 51–52. Patent Owner adds that Petitioner did not provide any evidence, in the form of testimony, to support its assertions. *Id.* at 52. In contrast, Patent Owner points to testimony of Mr. Markus stating that the combination of Glaesener and Choi would *not* have suggested the required modification to one of ordinary skill in the art. *Id.* at 52–53 (citing Ex. 2009 ¶ 56).

We agree with Patent Owner that Petitioner has not met its burden to show that a person of ordinary skill in the art would have modified Choi based on the disclosure of Glaesener resulting in the subject matter of the challenged claims. Petitioner asserts that “Glaesener teaches reinforcing the platen to reduce platen flex thereby reducing wear . . . [t]hus, Glaesener provides the motivation to rotate the tie rod and lock teeth by 45 degrees so there is no engagement of the lock members in the relatively higher flex zone.” Reply 12–13. To support this statement, Petitioner cites to Glaesener (Ex. 1002 ¶¶ 6, 8, 40, 45) describing a platen with reinforcing ribs and gussets for the purpose of reducing potential wear between contacting elements. Reply 12–13. Petitioner also cites to testimony by Carsten Link (Ex. 1006 ¶¶ 25–27) stating that these ribs and gussets would result in

relatively higher and lower flex zones similar to those described in the '536 patent. Reply 12–13.

None of the evidence that Petitioner relies on supports the logical leap contained in Petitioner's premise. Specifically, based on a teaching that wear should be reduced between contacting elements using ribs and gussets to reduce platen distortion (Ex. 1002 ¶¶ 6, 8), Petitioner asserts that a person of ordinary skill in the art would be motivated to rotate Choi's tie rod and lock teeth to ensure no engagement of the lock members in the relatively higher flex zones. Pet. 42–44; Reply 12–13. As support for this assertion, Petitioner points to U.S. Patent No. 2,916,768 (Ex. 1005, "Quéré"), issued on December 15, 1959. Petitioner asserts that the claimed "orientation for engagement of a complementary lock member and lock member was known as shown by Quéré." Pet. 43. Mr. Link, Petitioner's declarant, testifies that finite element analysis shows that in Quéré the corresponding coupling sleeve is engagable with corresponding claw within a relatively lower flex zone at the claimed clock positions. Ex. 1006 ¶ 70. We do not find this argument persuasive because unknown properties of the prior art may not be relied upon to provide the rationale for modifying or combining the prior art to reach the claimed subject matter. *See In re Newell*, 891 F.2d 899, 901 (Fed. Cir. 1989) ("a retrospective view of inherency is not a substitute for some teaching or suggestion which supports the ... combination"). Thus, even if Quéré does inherently include the claimed orientation of locking members, Petitioner does not point to persuasive evidence that a person of ordinary skill would have recognized this inherent feature of Quéré, and further, would have found it obvious to combine this feature with Choi.

On the other hand, Patent Owner provides testimony that a person of ordinary skill in the art would not find the proposed modification of Choi obvious based on the teachings of Glaesener and Choi. Ex. 2009 ¶ 56. Although this statement is conclusory and does not address whether a person of ordinary skill would have considered the modification at issue to be a minor design modification, it is Petitioner's burden to show obviousness. Petitioner has not met this burden.

We conclude that Petitioner has not shown by a preponderance of the evidence that claims 8–11, 13–16, 21, and 22 would have been obvious over Glaesener and Choi.

D. Anticipation by Arend

1. Overview of Arend (Ex. 1004)

Arend describes an injection molding machine with multiple platens containing mold parts that are united during the molding process and separated to release the molded product. Ex. 1004, 1:7–12. Arend's mold halves are connected by tie rods, which prevent the mold halves from separating during the molding process by locking the rods to the platen during molding. *Id.* at 1:6–12, 3:13–22. Figure 13, reproduced below, is an enlarged detail view of the platen lock cam nut structure illustrating a tie rod entering the associated platen. *Id.* at 4:58–60.

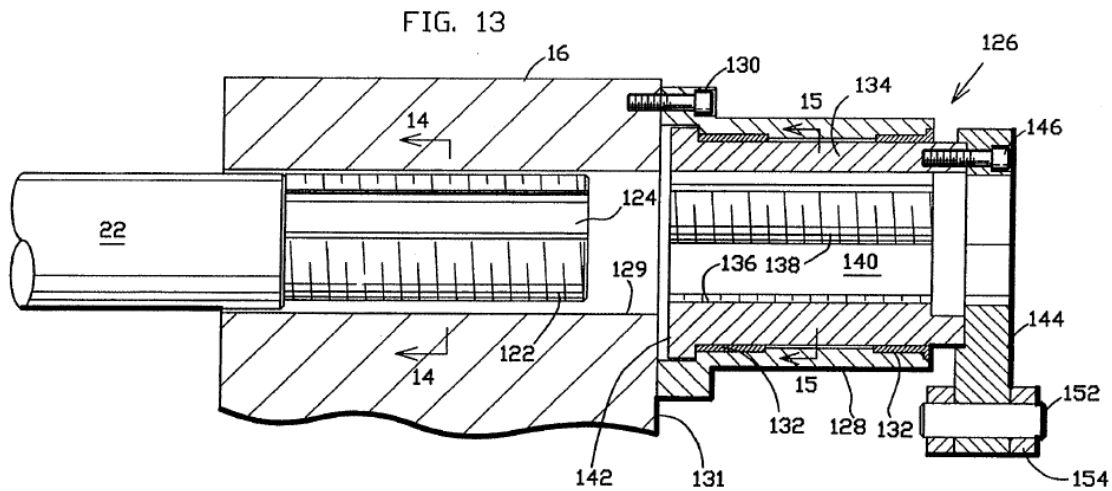


Figure 13, above, illustrates tie rod 22 associated with platen 16 and cam nut 134 with traverse end 142 that may directly abut against the platen surface 131. *Id.* at 7:50–66. Yoke 144 rotates the cam nut 134. *Id.* at 7:66–69.

Figure 14, reproduced below, is a sectional view of the tie rod end. *Id.* at 4:61–62. Figure 15, also reproduced below, is a sectional view of the lock cam nut. *Id.* at 4:63–64.

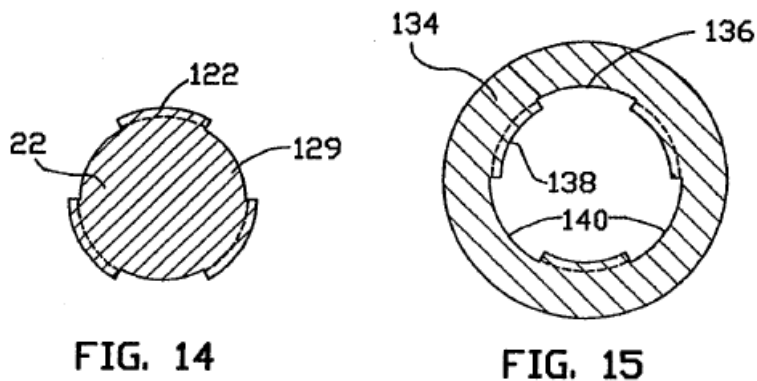


Figure 14, above, illustrates a section of tie rod 22 threaded at 122. *Id.* at 7:44–49. Figure 15, above, illustrates a section of the lock cam nut 134 with circular bore 136, thread segments 138, and notches 140 between the cam thread portions. *Id.* at 7:50–62. During the molding cycle, tie rod 22 is received within lock cam nut 134 at a time such that (i) the cam nut threads 138 align with the tie rod notches 124, (ii) the tie rod thread segments 122

align with the cam nut notches 140, and (iii) the two sets of thread segments engage. *Id.* at 8:67–9:21. The tie rod locks release upon completion of the molding cycle. *Id.* at 9:47–55.

2. *Anticipation*

Petitioner asserts that Arend anticipates claims 1, 4–16, 18, and 20–22. Pet. 44–50. Claim 1 is exemplary of the independent claims (claims 1, 12, and 18). In the Decision to Institute, we found that rod 22 of Arend equates to the claimed rod, platen 16 equates to the claimed platen, thread segments 122 equates to the claimed lock member, and thread segments 138 equate to the claimed complementary lock member. Dec. to Inst. 22. We also concluded that Petitioner had shown sufficiently that at least one of the embodiments described by Arend inherently discloses the engagement limitations. *Id.* at 22–23 (citing Ex. 1006 ¶¶ 56–64).

a. *“a rod movable between a clamped position and a released position”*

Patent Owner argues that Arend does not disclose the movable rod limitation as recited by claim 1. PO Resp. 53–55. Patent Owner bases this assertion on its proposed constructions of “released position” and the movable limitation, both of which, as discussed above, we decline to adopt. Specifically, Patent Owner states that although the rod in Arend “may tension, or stretch, it does not move.” PO Resp. 55. In addition, Patent Owner argues that “Arend is missing the key reason why the ’536 patent claims require a movable rod—to reduce wear between the lock member and complementary lock member when they engage.” *Id.* Mr. Markus echoes these statements in his testimony. Ex. 2009 ¶¶ 66–67.

We are persuaded that Arend discloses movement by the rod, including stretching, as we have construed the movable rod limitation. *See*

Claim Construction, Section II.A.2. First, Patent Owner appears to concede that Arend's rod "may stretch." PO Resp. 55. Second, substantial evidence supports this conclusion. Petitioner's declarant, Mr. Link, testifies that "clamping force stretches the tie rods 22, thereby clamping the platens 14, 16 and the mold parts 18, 20 in preparation for injection molding." Ex. 1006 ¶ 36 (citing Ex. 1004, 9:32–42 ("It will therefore be appreciated that hydraulic pressure within the chambers 86 will tension the tie rods 22")). Moreover, Mr. Markus appears to agree that the tie-rods in Arend "move" even using Patent Owner's more narrow proposed construction. Ex. 1011, 262:17–24 ("Q: . . . I'm just asking you does [Arend] teach moving the entire tie-rod. A: It moves the entire tie-rod. Q: And it moves it axially, does it not? A: Yes.").

b. "relatively higher flex zone"

Patent Owner argues that Arend does not disclose a zone in which there is no alignment of the lock member and complementary lock member—the "relatively higher flex zone" recited by claim 1. PO Resp. 55–56. We are not persuaded by this argument because, as explained above, we do not agree with this proposed construction of "relatively higher flex zone." Instead, we construe this term as "that portion of the platen that exhibits a higher flex, compared to the flex in any other portion of the platen, in response to the application of a clamping force on the platen." *See* Claim Construction, Section II.A.3.

Patent Owner also argues that Petitioner has not established that "relatively higher flex zones" are inherently disclosed by Arend. First, Patent Owner argues that Mr. Link does not establish that "relatively higher

flex zones” are *necessarily* present in Arend. PO Resp. 56. Second, Patent Owner argues that Mr. Link’s finite element analysis is flawed. *Id.* at 47.

We are persuaded that Arend inherently discloses relatively higher flex zones. Substantial evidence supports a finding that Arend’s platen 16 inherently includes a “relatively higher flex zone.” Ex. 1006 ¶¶ 56–61. For example, Mr. Link testifies that: (1) “a generally flat platen such as the platen 16 disclosed in Arend . . . inherently experiences a non-uniform distribution of flex in zones adjacent to an affixed tie rod in response to a clamping force applied to the platen, with the highest flex zone being in the region of the platen’s corners” (Ex. 1006 ¶ 56); and (2) “the portion of the platen 16 adjacent the tie rod 22 and farthest from the center of the platen 16 . . . exhibits the highest flex and therefore can be considered a ‘relatively higher flex zone’” (*id.* ¶ 60). Pet. 44–46.

Patent Owner challenges both the admissibility and the proper weight that should be given to Mr. Link’s testimony relating to finite element analysis. We address the admissibility of Mr. Link’s testimony below in our decision on Patent Owner’s motion to exclude evidence. We are not persuaded by Patent Owner’s argument that Mr. Link’s testimony should be given little or no weight simply because he is an employee of Petitioner and therefore may be biased. PO Resp. 56–57. The Federal Rules expressly permit expert testimony by a party’s employee (Fed. R. Civ. P. 26(a)(2)(B)), and we are not persuaded that, his status as an employee, alone, renders unreliable Mr. Link’s testimony.

Similarly, we are not persuaded by Patent Owner’s argument that Petitioner’s finite element analysis is not credible. *See* PO Resp. 47, 57–60. First, Patent Owner argues that Mr. Link’s analysis is flawed because he

outsourced the work to a member of his team. PO Resp. 58. We are not persuaded that Mr. Link's analysis is not credible because another employee did the work. *See Monsanto Co. v. David*, 516 F.3d 1009, 1015–16 (Fed. Cir. 2008) (stating that “an expert need not have obtained the basis for his opinion from personal perception” and “reliance on the scientific reports prepared by his team is therefore the type of reliance that is reasonable for expert witnesses.”). Our rules do not require that the declarant attesting to testing evidence be the person who actually conducted the test. *See* 37 C.F.R. § 42.65(b). We, therefore, do not discount the testimony for this reason.

Second, Patent Owner argues, based on testimony by Mr. Markus, that Mr. Link incorrectly assumes an even load distribution on the platen, and shows an exaggerated and misleading deformation profile. PO Resp. 57–60 (citing Ex. 2009 ¶¶ 103–108). We are not persuaded by Mr. Markus's testimony that the finite element analysis is technically flawed. Ex. 2009 ¶¶ 102–109. Mr. Markus concludes, without explanation or citation to underlying objective evidence, that “correctly identifying the location of force loading on the platen will impact the location of zones of relative flex” and that the finite element analysis does not show “an accurate depiction of the flex characteristics of the platens described.” *Id.* ¶¶ 106, 109. Even if we were persuaded by this testimony, the construction of “relatively higher flex zone” does not require a particular location. Thus, whether the flex characteristics are shown in exactly the same locations does not affect whether Arend discloses a “portion of the platen that exhibits a higher flex, compared to the flex in any other portion of the platen, in response to the application of a clamping force on the platen.” Patent Owner does not direct

us to persuasive evidence by Mr. Markus or otherwise, disputing that Arend inherently discloses a relatively higher flex zone as we have construed this term.

Moreover, the portions of Mr. Link's testimony involving finite element analysis serve as supporting evidence for Mr. Link's opinions. In other words, Mr. Link testifies, independent of his finite element analysis, that based on his experience, platen 16 inherently experiences non-uniform distribution of flex and a relatively higher flex zone. *See, e.g.* Ex. 1006 ¶ 56. Patent Owner does not dispute this testimony.

c. "relatively lower flex zone"

For the same reasons we are persuaded that Arend inherently discloses "relatively higher flex zone," we are persuaded that Arend also inherently discloses "relatively lower flex zones." As discussed above, we do not agree with Patent Owner's construction of this term. Nor do we agree that Mr. Link's testimony is not credible. Moreover, substantial evidence supports a finding that Arend's platen 16 inherently includes "relatively lower flex zones." Ex. 1006 ¶¶ 56–61. For example, Mr. Link testifies that: (1) "a generally flat platen such as the platen 16 disclosed in Arend . . . inherently experiences a non-uniform distribution of flex in zones adjacent to an affixed tie rod in response to a clamping force applied to the platen" (Ex. 1006 ¶ 56); and (2) "portions of the platen 16 adjacent the tie rod 22 and nearer the center of the platen 16 can be considered a 'relatively lower flex zone'" (*id.* ¶ 60). Pet. 44–46.

d. Other limitations

We are persuaded that the other limitations recited by independent claim 1 are disclosed by Arend. *See* Pet. 47. Other than the limitations

discussed above, Patent Owner does not address explicitly any limitations of this claim.

e. Conclusion

Petitioner has shown by a preponderance of the evidence that Arend anticipates independent claim 1. Independent claims 12 and 18 are not materially different than claim 1 for purposes of comparison with Arend, so Petitioner has also shown by a preponderance of the evidence that Arend anticipates claims 12 and 18. Petitioner has also demonstrated by a preponderance of the evidence that Arend discloses all the additional features required by dependent claims 4–11, 13–16, and 20–22. *See* Pet. 44–50. We conclude that Petitioner has shown by a preponderance of the evidence that claims 1, 4–16, 18, and 20–22 are anticipated by Arend.

E. Patent Owner's Motion to Amend Claims

Because we determine that independent claims 1, 12, and 18 are unpatentable, we turn to Patent Owner's contingent request to enter proposed, amended claims 23, 34, and 40.⁷

1. Proposed Amended Claim 23

Proposed claim 23 is reproduced below with underlining to indicate additions to claim 1 of the issued '536 patent.

23. (Proposed Conditional Substitute for Challenged Claim 1)
A lock of a molding system having a rod and a platen, the lock comprising:

⁷ Patent Owner adds that if any of proposed claims 23, 34, and 40 is added to the '536 patent, Patent Owner requests that the corresponding dependent claims be amended to correspond to the new claim. Mot. to Amend 1. Because we do not add claims 23, 34, or 40 to the patent, we do not address the corresponding dependent claims.

a lock member associated with the rod that is movable between a clamped position and a released position by a clamp assembly; and

a complementary lock member associated with the platen; the lock member and the complementary lock member cooperatively operable to move between a lockable condition and an unlockable condition; wherein

the complementary lock member is engagable with the lock member within a relatively lower flex zone of the platen; the relatively lower flex zone of the platen being a portion of the platen adjacent to the rod and having a flex that is lower relative to a relatively higher flex zone of the platen also adjacent to the rod; wherein

in the clamped position, the lock member and the complementary lock member are aligned, and a clamping force is applied to the rod;

in the released position, the lock member and the complementary lock member are aligned, and the clamping force is not applied to the rod; and

the entire rod moves axially between the clamped position and the released position.

Patent Owner argues that proposed claim 23 is patentable because none of the prior art of record, nor any other prior art of which it is aware, “discloses a system in which the entire rod moves axially, let alone a rod that moves axially between a released position and a clamped position, as set forth in claim 23.” Mot. to Amend 3 (citing Declaration of George Markus, Ex. 2043 ¶¶ 35–39). Further, Mr. Markus testifies that “I believe that the proposed amendments to claim 1 describe a machine that is different from prior injection molding machines, and that a person of ordinary skill in the field of injection molding would not have arrived at these different machine characteristics after reading the ‘prior art.’” Ex. 2043 ¶ 39.

Petitioner argues that proposed claim 23 is anticipated by Arend. Opp. Mot. to Amend 3–5. Specifically, Petitioner asserts that Arend discloses that “the entire tie rod 22 moves axially between . . . a released condition in which the threads 138, 122 are aligned and the gap between cam nuts 134 and platen surface 131 has been closed before applying a clamping force to tie rods 22” and “a condition in which the clamp mechanism applies a tensile clamping force to stretch tie rods 22 and clamp platens 14, 16, thereby disclosing the third new limitation of claim 23.” *Id.* at 4.

Patent Owner argues in reply that Petitioner is incorrect in its description of how the device in Arend works, because: (1) Arend does not disclose a gap between the threads of the Arend lock and tie rod; and (2) Arend explicitly teaches that its threaded structure ensures that there is no axial movement of the rod upon application of clamping force. Reply Mot. to Amend 2 (citing Ex. 1004, 3:29–34 (“At their free ends, the tie rods are received within platen mounted nut devices utilizing thread type cam surfaces cooperating with thread surfaces mounted upon the tie rod ends *to prevent relative axial movement between the tie rod free end and the associated platen*” (emphasis added))). Finally Patent Owner argues that even if deflection of the corners of a platen results in axial movement of the rods in Arend, such axial movement is not explicitly or inherently disclosed by Arend. Reply Mot. to Amend 2.

We are not persuaded, by any of Patent Owner’s arguments, that the injection molding machine of the proposed claim is patentable over Arend. First, it is irrelevant whether or not Arend shows a gap. Proposed claim 23 does not recite a gap. The same is true for the broadest reasonable

interpretation of the terms “released position” (“a condition in which no clamping force has been applied to the rod”) and “clamped position” (“a condition in which the lock member and the complementary lock member are aligned, and the clamping force is applied to the rod”). The additional limitations of proposed claim 23 referring to “clamped position” and “released position” are consistent with this interpretation.

Second, we are not persuaded by Patent Owner’s assertion that Arend explicitly teaches that its threaded structure *ensures* that there is no axial movement of the rod upon application of clamping force. The language in Arend that Patent Owner relies upon for this assertion states that the ends of the tie rods are locked in such a way “to prevent relative axial movement.” Ex. 1004, 3:28–34. This language reveals that a goal of Arend’s invention is to minimize axial movement of the rod. It is not clear, however, that the goal is to prevent *all* axial movement or that Arend’s invention *achieves* absolutely no axial movement of the rod. Moreover, Mr. Markus conceded that there *is* axial movement of the rod in Arend.

Q (By Mr. Schmitt) So my question is if in fact -- is it in fact the case that Arend teaches moving a rod between a clamped position and a released position?

MR. ROBINSON: Objection; form.

A Probably he does move -- if I recall correctly, he does move it.

Q (By Mr. Schmitt) So in Arend the entire tie-rod does move, moving from and going from the clamped position to the released position; is that correct?

A That's a giant movement retraction of the tie-bar.

Q It's a --

A Nothing to do with wear.

Q I'm not talking about wear. I'm just asking you does it teach moving the entire tie-rod?

A It moves the entire tie-rod.

Q And it moves it axially, does it not?

A Yes.

Q In the operation of it it moves axially; correct?

A Yes.

Opp. Mot. to Amend 3 (citing Ex. 1011, 262:2–24); *see also* Ex. 1011, 154:24–155:24 (Mr. Markus agreeing that the flexing of a platen when clamping force is applied or released results in axial movement of the entire tie rod).

Although, as Patent Owner correctly points out, the evidence of record on Arend’s axial movement may not rise to the level of showing required to prove inherent disclosure for anticipation, Petitioner does not have the burden to make such a showing. Instead, it is Patent Owner that has the burden to show they are entitled to the relief requested in their motion—the entry of proposed claim 23. Patent Owner, however, has not pointed to persuasive evidence that a person of ordinary skill in the art would *not* realize that the rod in Arend has some axial movement. This deficiency renders unpersuasive Mr. Markus’s testimony that a person of ordinary skill in the field of injection molding would not have arrived at proposed claim 23. *See* Ex. 2043 ¶ 39. Thus, we are not persuaded that Patent Owner has met the burden it undertook in presenting proposed claim 23.

2. *Proposed Claim 34*

Proposed claim 34 is reproduced below with underlining to indicate additions to claim 12 of the issued ’536 patent.

34. (Proposed Conditional Substitute for Challenged Claim 12)

A molding system comprising:

a rod that is movable between a clamped position and a released position by a clamp assembly; wherein a first end of the rod is coupled to a clamp and the clamp is configured to move the rod axially between the clamped position and the released position;

a platen;

a lock including:

a lock member associated with a second end of the rod;
and

a complementary lock member associated with the platen of the molding system, the complementary lock member being cooperatively operable to move between a lockable condition and an unlockable condition with the lock member, the complementary lock member being engagable with the lock member within a relatively lower flex zone of the platen;

the relatively lower flex zone of the platen being a portion of the platen adjacent to the rod and having a flex that is lower relative to a relatively higher flex zone of the platen also adjacent to the rod.

Patent Owner argues that proposed claim 34 is patentable because none of the prior art “disclose[s] a clamp that is configured to move the rod axially between the clamped position and the released position.” Mot. to Amend 5 (citing Declaration of George Markus, Ex. 2043 ¶¶ 47–48). Patent Owner further argues that “none of the references disclose such a clamp on a first end of the rod while a lock member is associated with a second end of the rod.” *Id.* at 6 (citing Ex. 2043 ¶ 48).

Petitioner argues that Arend’s housing 78, piston 94, piston rod sleeve 88, and nut 112 combined disclose a clamp coupled to one end of tie rod 22. Opp. Mot. to Amend 9 (citing Ex. 1004, 7:5–25, 7:50–62, Fig. 6; Declaration of Carsten Link, Ex. 1012 ¶¶ 6–7). Further, Petitioner argues

that Arend's tie rod threads 122 disclose a lock member associated with a second end of the rod. *Id.* (citing Ex. 1004, 7:44–45, Figs. 6, 13, 16; Ex. 1012 ¶¶ 6, 8).

Patent Owner argues in reply that Arend does not disclose axial movement of the rod or “a clamp at a first *end* and a lock at a second *end*.” Reply Mot. to Amend 4. According to Patent Owner, the clamp is located in the middle of the tie rod. *Id.* (citing Ex. 1004, Figs. 6, 24).

We are not persuaded by Patent Owner's arguments. For the reasons discussed with respect to proposed claim 23, we are persuaded that a person of ordinary skill in the art would realize that the rod in Arend moves axially. Moreover, Patent Owner does not point to persuasive evidence that, even if Arend's clamp is shown in the middle of a tie bar, a person of ordinary skill in the art would not have found it obvious to move the clamp to the end. In fact, Mr. Markus testifies that no prior art he is aware of discloses the clamp on one end *and* the lock on the other. Ex. 2043 ¶ 47. However, he does not testify that no prior art ever shows a clamp on one end of the tie rod. Mr. Markus also does not opine on whether a person of ordinary skill in the art would have found it obvious to place a clamp on the end, as opposed to the middle, of a tie rod. *See id.* ¶ 49 (opining that “the proposed amendments to claim 1,” which do not refer to the end of the tie bar, “describe a machine that . . . a person of ordinary skill in the field of injection molding would not have arrived at . . . after reading the ‘prior art.’”). Thus, we are not persuaded that Patent Owner has met the burden it undertook by putting forth proposed claim 34.

3. *Proposed Claim 40*

Proposed claim 40 is reproduced below with underlining to indicate additions and strikethrough to indicate deletions from claim 1 of the issued '536 patent.

40. (Proposed Conditional Substitute for Challenged Claim 18)
A method of actuating a lock of a molding system having a rod that is movable between a clamped position and a released position by a clamp assembly and a platen, the method comprising:

engaging a lock member associated with the rod with a complementary lock member associated with the platen at a position located proximate to a relatively lower flex zone of the platen;

the relatively lower flex zone of the platen being a portion of the platen adjacent to the rod and having a flex that is lower relative to a relatively higher flex zone of the platen also adjacent to the rod; wherein the portion of the platen adjacent to the rod comprises a highest flex zone within which there is no engagement of any lock member associated with the rod with any complementary lock member associated with the platen.

Patent Owner argues that proposed claim 40 is patentable because none of the prior art discloses a system with the additional limitation. Mot. to Amend 9 (citing Declaration of George Markus, Ex. 2043 ¶ 54). Further, Mr. Markus testifies that “I am not aware of any other ‘prior art’ documents that describe high and low flex zones of a platen in a manner that is similar to the disclosure of the '536 patent.” Ex. 2043 ¶ 56.

Petitioner argues that proposed substitute claim 40 is indefinite because it identifies the *same* portion of the claimed platen is both “the relatively lower flex zone” and the “highest flex zone,” which is physically

impossible. Opp. Mot. to Amend 11 (citing George Markus Deposition, Ex. 1011, 290:22–291:2). This indefiniteness arises because the antecedent to “the portion of the platen” in the limitation “wherein the portion of the platen adjacent to the rod comprises a highest flex zone . . .” can only be the relatively lower flex zone—“the relatively lower flex zone of the platen being a portion of the platen adjacent to the rod and having a flex that is lower relative to a relatively higher flex zone of the platen also adjacent to the rod.” *Id.*

Patent Owner does not address indefiniteness in its Reply and made no attempt to remedy the alleged error. *See* Reply Mot. to Amend 4–5. During oral argument, Patent Owner stated that “[o]ne of skill in the art would understand that those are – we’re talking about two different portions adjacent.” Tr. 86:1-2. But Patent Owner does not point to persuasive evidence that this is the case. We agree with Petitioner that the plain language of the claim requires a physical impossibility, that the same portion of the claimed platen is both “the relatively lower flex zone” and the “highest flex zone.” It is Patent Owner’s burden to show patentability of the proposed claim, and we are not persuaded that Patent Owner has met that burden here.

Even if we agreed with Patent Owner, however, that a person of ordinary skill in the art would have understood the relatively lower flex zone and the highest flex zone to be two different areas of the platen, and therefore not indefinite, we would still not be persuaded that Patent Owner has met its burden to show patentability over the prior art. Petitioner further argues that it would have been obvious to rotate the lock members disclosed by Choi so that they do not engage in the highest flex zone. Above, with

respect to the original claims, we explain that we are not persuaded that Petitioner met its burden to show that this sort of rotation would have been obvious to a person of ordinary skill based on the disclosure of Glaesener. Instead, we note that, on this record, Patent Owner provides the only testimony on this issue, stating that a person of ordinary skill in the art would not find the proposed modification of Choi obvious based on the teachings of Glaesener and Choi. Ex. 2009 ¶ 56.

We also are not persuaded that Patent Owner has met its burden to show the reverse—that a person of ordinary skill would not find this obvious. As we note above, Patent Owner’s testimony on this issue is conclusory and does not address whether a person of ordinary skill would have considered the modification at issue to be a minor design modification. *Id.* Thus, we are not persuaded that Patent Owner has met the burden it undertook by presenting proposed claim 40.

F. Patent Owner’s Motion to Exclude

Patent Owner seeks to exclude testimony by Mr. Link, identified as paragraphs 42–72 of Exhibit 1006 (Mr. Link’s Declaration) and Exhibits 1016 and 1017 (Mr. Link’s Deposition), relating to his opinions concerning finite element analysis. Mot. to Exclude 1. According to Patent Owner, this evidence should be excluded as unreliable under *Daubert* and Fed. R. Evid. 702. *Id.* at 2–3 (citing *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579 (1993)). Patent owner asserts that “Mr. Link did not have sufficient knowledge of the methodology used to conduct his finite element analysis.” Mot. to Exclude 5. Patent Owner goes on to argue “to the extent that Mr. Link did disclose a methodology underlying his finite element analysis,

Athena has not shown the reliability or industry's acceptance of that methodology." *Id.*

The party moving to exclude evidence bears the burden of proof to establish that it is entitled to the relief requested—namely, that the material sought to be excluded is inadmissible under the Federal Rules of Evidence. *See* 37 C.F.R. §§ 42.20(c), 42.62(a). The subject of an inquiry under Fed. R. Evid. 702 “is scientific validity—and thus the evidentiary relevance and reliability—of the principles that underlie a proposed submission.” *Daubert*, 509 U.S. at 594–95. 37 C.F.R. § 42.65, as with Fed. R. Evid. 702, is intended to ensure that a party proponent meets a threshold level of reliability when offering technical tests and data as evidence.

We are persuaded that Petitioner has met that threshold level of reliability. It is undisputed that finite element analysis, in general, is a reliable tool used to analyze the types of devices at issue in this case. *See, e.g.*, Ex. 1023 (U.S. Patent No. 7,080,978 assigned to Patent Owner), 8:1–5 (“finite element analysis (FEA) can be employed to determine optimum structural configurations”). Moreover, Mr. Link testifies that he has a degree in mechanical engineering and has spent eight years designing hydraulic and electric clamping systems, for which he regularly used and relied upon finite element analyses. Ex. 1006 ¶ 2; Ex. 1007 ¶ S3.

Patent Owner, on the other hand, offers no credible evidence to support its assertion that Mr. Link did not have sufficient knowledge of the methodology used to conduct his finite element analysis. Rather, Patent Owner merely cites to the testimony of Mr. Link. *Id.* at 5–7 (citing Ex. 1016, 21–25, 28–29, 35–36, 75, 107–108). We have reviewed this

testimony, and we are not persuaded that Mr. Link does not have sufficient knowledge of the methodology discussed.

Patent Owner also asserts that Mr. Link “left out important experimental details, such as the actual steps conducted, the source of the underlying ‘variations’ and ‘material properties’ that were tested.” *Id.* at 4 (citing Ex. 1006, App’x A–D). We are not persuaded that Mr. Link’s summary of how the finite element analysis was conducted is a sound basis on which to exclude his testimony. The degree to which an expert discloses the facts or data on which an opinion is based affects the weight accorded the expert’s testimony, not to its admissibility. 37 C.F.R. § 42.65(a). And as explained above, Patent Owner does not persuade us that Mr. Link’s testimony on finite element analysis should be discounted based on Mr. Markus’s conclusory testimony. Accordingly, we overrule Patent Owner’s objection to Mr. Link’s testimony regarding finite element analysis.

Patent Owner also seeks to exclude Exhibit 1020 (allegedly the original German PCT application of US Patent No. 6,210,144 B1) and Mr. Link’s testimony related to that exhibit. Mot. to Exclude 14–15. Because, as acknowledged by Patent Owner (Reply Mot. to Exclude 4), Petitioner does not rely on that evidence, this request is moot.

For the foregoing reasons, Patent Owner’s Motion to Exclude is *denied*.

CONCLUSION

Petitioner has shown, by a preponderance of the evidence, that claims 1, 4–16, and 20–22 are anticipated by Arend. Petitioner has not shown that claims 2, 3, 17, or 19 are unpatentable.

Patent Owner has not shown that its proposed substitute claims 23, 34, and 40 are patentable over the prior art.

Accordingly, it is

ORDERED that claims 1, 4–16, and 20–22 of the '536 patent are determined to be *unpatentable*;

FURTHER ORDERED that Patent Owner's Motion to Amend Claims is *denied*;

FURTHER ORDERED that Patent Owner's Motion to Exclude is *denied*;

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.

IPR2013-00290
Patent 7,670,536 B2

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