

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

L&P PROPERTY MANAGEMENT COMPANY,
Petitioner,

v.

REMACRO MACHINERY & TECHNOLOGY (WUJIANG) CO., LTD.,
Patent Owner.

IPR2019-00255
Patent 9,756,949 B2

Before LINDA E. HORNER, CARL M. DeFRANCO, and
ROBERT L. KINDER, *Administrative Patent Judges*.

HORNER, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
Denying Patent Owner's Motion to Amend
35 U.S.C. § 318(a)

We have jurisdiction to conduct this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed herein, we determine that L&P Property Management Company (“L&P”) has shown, by a preponderance of the evidence, that claims 1–3 of U.S. Patent No. 9,756,949 B2 (Ex. 1001, “the ’949 patent”) are unpatentable. We also deny Remacro Machinery & Technology (Wujiang) Co., Ltd.’s (“Remacro’s”) Revised Contingent Motion to Amend.

I. BACKGROUND

A. Procedural History

L&P filed a petition challenging all the claims, i.e., claims 1–3, of the ’949 patent. Paper 2 (“Pet.”). On April 26, 2019, we instituted trial. Paper 8. Remacro filed a Response (“PO Resp.”) and a Contingent Motion to Amend Under 37 C.F.R. § 42.121. Papers 18, 19. L&P filed a Reply (“Pet. Reply”) and an Opposition to the Contingent Motion to Amend. Papers 21, 22. At Remacro’s request, we issued Preliminary Guidance on Remacro’s Contingent Motion to Amend. Paper 23. In our Preliminary Guidance, we stated that although Remacro appeared to have shown a reasonable likelihood that it had satisfied the statutory and regulatory requirements associated with filing a motion to amend for proposed substitute claims 4 and 5, Remacro did not appear to have shown a reasonable likelihood that it met the statutory and regulatory requirements for proposed substitute claim 6. *Id.* at 3–6. We also stated that L&P (or the record) appears to have shown a reasonable likelihood that proposed substitute claims 4–6 are unpatentable over the prior art of record. *Id.* at 6–10.

In response to this Preliminary Guidance, Remacro filed a Revised Contingent Motion to Amend (“RMTA”), in which Remacro proposes a new set of substitute claims 4–6. Paper 24. Remacro also filed a Sur-Reply to the Petition (“PO Sur-Reply”). Paper 25. L&P then filed an Opposition to Remacro’s Revised Motion to Amend (“RMTA Opp.”), Remacro filed a Reply (“RMTA Reply”), and L&P filed a Sur-Reply (“RMTA Sur-Reply”). Papers 27, 32, 34. We held an oral argument on February 21, 2020. Paper 36 (Transcript, “Tr.”).

B. Real Parties in Interest

L&P identifies itself along with Leggett & Platt, Incorporated, as real parties in interest. Pet. 2. Remacro identifies itself and parent company Man Wah Industrial Company Limited as real parties in interest. Paper 4 (Patent Owner’s Mandatory Notices Under 37 C.F.R. § 42.8), 2.

C. Related Matters

Neither L&P nor Remacro has identified any other judicial or administrative matters that would affect, or be affected by, a decision in this proceeding. Pet. 2; Paper 4, 2.

D. The ’949 Patent

The ’949 patent relates to an electromechanical stretching apparatus of a convertible sofa consisting of a prior art mechanical stretching apparatus and an electric actuator. Ex. 1001, 3:20–30. The ’949 patent describes an embodiment of the electromechanical stretching apparatus shown schematically in Figure 4 reproduced below.

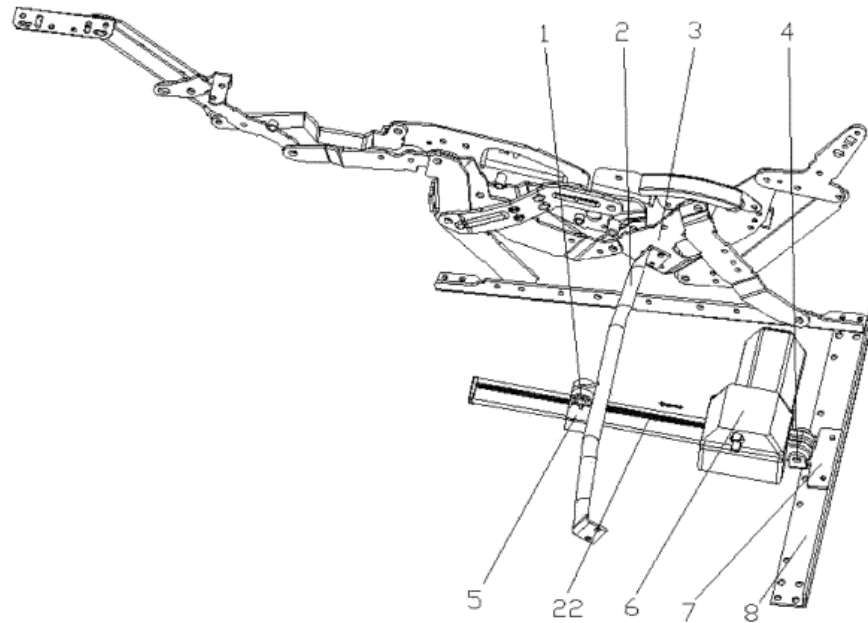


FIG. 4

Figure 4 shows a schematic diagram of main components and an operational mode according to an embodiment of the invention. *Id.* at 2:60–62. The mechanical stretching apparatus (largely unnumbered as depicted in Figure 4 above) includes linkage part 3 and is installed with electrically-driven connecting rod 8. *Id.* at 3:28–29, 37–38. Only one side of the mechanical stretching apparatus is shown in Figure 4.

The electric actuator consists of motor 6, motor connecting tube 2, motor movable slider 5, and motor head fixing part 7. *Id.* at 3:30–32. Motor 6 includes guide rail 22, on which motor movable slider 5 moves. *Id.* at 3:32–33, 3:47–48. The motor head is rotationally connected through second rotor shaft 4 to motor head fixing part 7, which is fastened on connecting rod 8. *Id.* at 3:33–36. Motor connecting tube 2 is fastened at each end through a bolt on linkage part 3 of each side of the mechanical stretching apparatus. *Id.* at 3:36–38. “Motor connecting tube 2 is

rotationally connected to motor movable slider 5 through first rotor shaft 1.”
Id. at 3:45–47.

The various states of the mechanical stretching apparatus are shown in Figures 1 through 3, reproduced below.

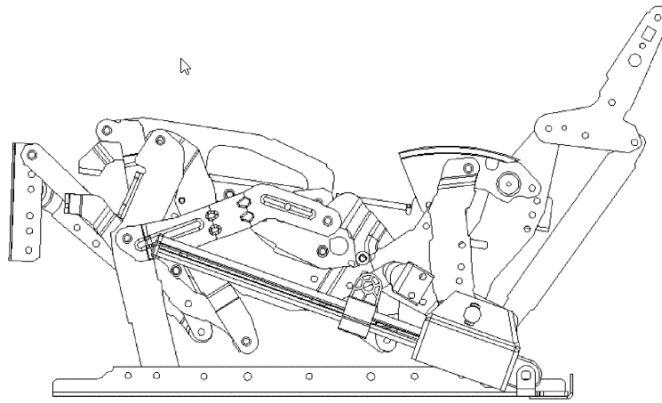


FIG. 1

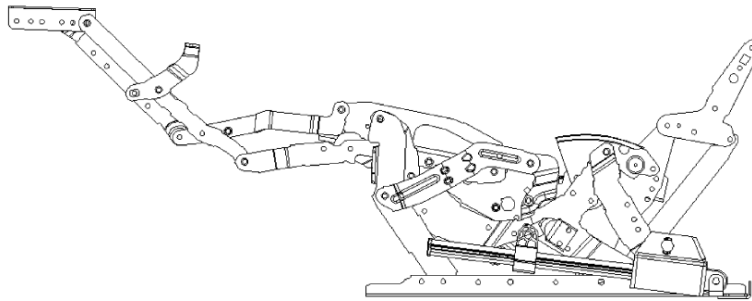


FIG. 2

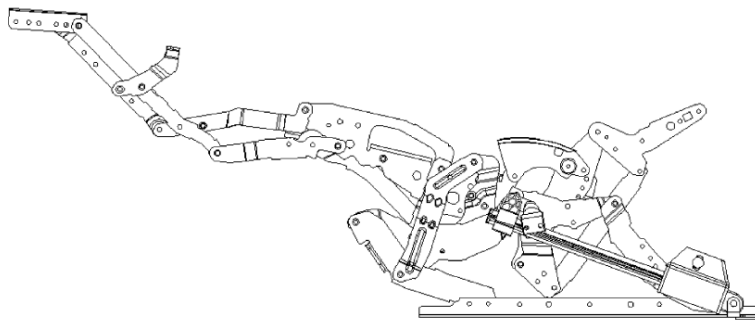


FIG. 3

Figure 1 (depicted above at top) shows a first state in which the back part of the mechanical stretching apparatus is substantially vertical and the leg part is folded. *Id.* at 2:52–54. Figure 2 (middle) shows a second state in which

the back part remains substantially vertical and the leg part is unfolded. *Id.* at 2:55–57. Figure 3 (bottom) shows a third state in which the back part is inclined horizontally and the leg part remains unfolded. *Id.* at 2:58–59.

In motion, motor connecting tube 2 is driven by forward movement (toward the left side of Figure 4) of motor movable slider 5 along guide rail 22, a motor head is rotationally connected through second rotor shaft 4 to motor head fixing part 7 fastened on connecting rod 8, and motor connecting tube 2 is fastened on linkage part 3 of the mechanical stretching apparatus. *Id.* at 3:55–64. Due to the weight of the user and an acting force of motor connecting tube 2 driven by motor movable slider 5, a leg structure of the mechanical stretching apparatus is unfolded first until it reaches a limit, at which point a back structure of the mechanical stretching apparatus is driven to an inclined position. *Id.* at 3:64–4:9 (describing transformation from a state shown in Figure 1, to a state shown in Figure 2, to a state shown in Figure 3). When motor movable slider 6 moves in reverse (toward the right side of Figure 4), the stretching apparatus transforms from the state shown in Figure 3, to the state shown in Figure 2, and then to the state shown in Figure 1. *Id.* at 4:9–15. Rotational connection of first rotor shaft 1 and second rotor shaft 4 is by means of bolt connection. *Id.* at 4:21–23.

E. Challenged Claims

Of the challenged claims, claim 1 is independent. Claim 1 is illustrative and recites¹:

1. An electromechanical stretching apparatus of a convertible sofa, consisting of

¹ We add lettering in brackets for ease of identifying claim limitations in the Decision that follows. This lettering adopts the identifiers used by L&P in the Petition, and adopted by Remacro in the Response.

[a] a mechanical stretching apparatus and an electric actuator, the mechanical stretching apparatus being provided with an electrically-driven connecting rod, wherein, the electric actuator consists of

- [b] a motor,
- [c] a motor connecting tube,
- [d] a motor movable slider, and
- [e] a motor head fixing part,
- [f] the motor adopted is a motor with a guide rail,
- [g] the motor movable slider is installed on the guide rail of the motor,
- [h] the motor head is rotationally connected through a second rotor shaft to the motor head fixing part fastened on the electrically-driven connecting rod,
- [i] the motor connecting tube is connected to the motor movable slider through a first rotor shaft and
- [j] the motor connecting tube is fastened on the mechanical stretching apparatus.

Ex. 1001, 4:43–58.

F. References

L&P relies on the following prior art references in the asserted grounds of unpatentability:

- a) *Lawson '498*: U.S. Patent No. 8,944,498 B2, issued February 3, 2015, filed in the record as Exhibit 1003.
- b) *Lawson '228*: U.S. Patent No. 8,308,228 B2, issued November 13, 2012, filed in the record as Exhibit 1004.

G. Asserted Grounds of Unpatentability

L&P challenges the patentability of claims 1–3 of the ’949 patent on each of the following grounds (Pet. 4):

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1–3	103 ²	Lawson ’228
1–3	103	Lawson ’498
1–3	103	Lawson ’228, Lawson ’498

L&P supports its challenge with a Declaration of Robert B. Stone, Ph.D., filed as Exhibit 1005 (“Stone Dec.”) and a Supplemental Declaration of Robert B. Stone, Ph.D., filed as Exhibit 1006 (“Supp. Stone Dec.”). Remacro supports its rebuttal with a Declaration of Dr. Kimberly K. Cameron, filed as Exhibit 2010 (“Cameron Dec.”).

II. ANALYSIS

A. Principles of Law

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). “When a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103. Because the ’949 patent was filed before the effective date of the relevant amendment, the pre-AIA version of § 103 applies.

field, the combination must do more than yield a predictable result.” *Id.* at 416 (citing *United States v. Adams*, 383 U.S. 39, 50–51 (1966)). The question of obviousness is resolved based on underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of non-obviousness.³ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

In an *inter partes* review, a petition must identify “with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge to each claim.” 35 U.S.C. § 312(a)(3) (2012); *see also* 37 C.F.R. § 42.104(b) (2018) (requiring a petition for *inter partes* review to identify how the challenged claim is to be construed and where each element of the claim is found in the prior art patents or printed publications relied upon).

B. Level of Ordinary Skill in the Art

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

L&P contends that a person having ordinary skill in this art would have been:

³ Remacro did not submit objective evidence of non-obviousness with its Patent Owner Response, or in papers related to its Revised Motion to Amend.

a person with a good working knowledge of basic mechanical principles, such as electromechanical design. This person would have gained this knowledge through an associate's or bachelor's degree in mechanical engineering or a comparable field, or through practical work experience in electromechanics or a comparable field.

Pet. 8 (citing Ex. 1005 ¶¶ 41–44).

In its Response, Remacro argues that according to its expert, Dr. Kim Cameron, a person having ordinary skill in the art “would have had at least an undergraduate degree in mechanical engineering, along with at least one year of experience working with the design and development of rotary and linear motion systems.” PO Resp. 21–22 (citing Ex. 2010 ¶ 15).

Both L&P's and Remacro's supporting expert testimony differ slightly from the parties' respective positions in their papers. For instance, L&P's expert states that a person having ordinary skill in the art would have had a good working knowledge of basic mechanical principles, such as “mechatronics,” as opposed to “electromechanical design.” Ex. 1005 ¶ 42. And L&P's expert states that such a person would have gained this knowledge through a degree in mechanical engineering or a comparable field, or through practical work experience in “electromechanical design” or a comparable field, as opposed to “electromechanics.” *Id.* We do not find, and Remacro does not argue, that these slight differences between the terminology used in the Petition and the terminology used by L&P's expert are substantive differences. As we noted in the Institution Decision, we find that the terminology set forth in the Petition is more consistent with the language of the challenged patent. Paper 8, 9.

Remacro's expert, likewise, proffers a level of ordinary skill in the art that differs from the level proposed in Remacro's Response. For instance, in

Remacro's Response, the proposed level of skill calls for an undergraduate degree *and* at least one year of experience in rotary and linear motion systems. PO Resp. 21–22. Remacro's expert opines, however, that a person having ordinary skill in the art “would have had at least a degree in mechanical engineering, *or* equivalent practical experience working with the design and development of rotary and linear motion systems.” Ex. 2010 ¶ 15 (emphasis added). Thus, Remacro's own expert opines that the person of skill does not require both a degree in mechanical engineering and work experience. Rather, Remacro's expert appears to agree with L&P's expert that a person having ordinary skill in the art would have a degree in mechanical engineering or practical work experience.

The only difference between the expert opinions is the description of the field of the art for purposes of practical experience. The parties have not argued that a substantive difference exists between work experience in “electromechanics” versus “rotary and linear motion systems.” We find that “rotary and linear motion systems” is a “comparable field” to “electromechanics” for purposes of defining the level of ordinary skill such that it is encompassed by L&P's proposed level of ordinary skill in the art. Thus, we find L&P's level of ordinary skill in the art proposed in the Petition appropriate, and we apply that definition here.

C. Claim Construction

In an *inter partes* review filed before November 13, 2018, claim terms in an unexpired patent are given their broadest reasonable interpretation in

light of the specification of the patent in which they appear.⁴ 37 C.F.R. § 42.100 (2018). Claim terms generally 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. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). The specification may impose a specialized meaning, departing from the ordinary and customary meaning, by defining a term with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (applying *Vivid Techs.* in the context of an *inter partes* review).

In the portion of the Petition directed to claim construction, L&P asserts that because the disclosures in the asserted prior art are “squarely within the scope of the challenged claims,” the “Board likely will not need to adopt specific constructions.” Pet. 9. Thus, L&P does not propose specific constructions for any claim terms and asserts that each of the terms in the challenged claims can be given its plain and ordinary meaning. *Id.* Despite this representation that no specific claim construction is needed,

⁴ This Petition was filed before the effective date of the amendment to 37 C.F.R. § 42.100 that changed the claim construction standard applied in *inter partes* reviews. Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51340 (Nov. 13, 2018) (now codified at 37 C.F.R. pt. 42 (2019)). Thus, we use the broadest reasonable interpretation claim construction standard for this proceeding.

L&P presents interpretations within the explanation of the asserted grounds for the following claim terms: “the motor head,”⁵ “the motor connecting tube is *connected* to the motor movable slider through a first rotor shaft” (emphasis added),⁶ “electrically-driven connecting rod,”⁷ “first rotor shaft,” and “second rotor shaft.”⁸ As discussed in detail below, of these claims terms, we find it necessary to interpret “the motor head” and “connected.” We do not need to interpret the other claim terms implicitly defined in L&P’s Petition.

Remacro asserts that only one term should be construed. PO Resp. 14. Remacro asserts that the phrase “is fastened on” should be construed as “is fixed to.” *Id.* at 15. Remacro asserts that L&P’s interpretations of “is fastened on” to encompass “is pivotally coupled” or “rotatably coupled with” are unreasonably broad and inconsistent with the intrinsic record and the extrinsic evidence. *Id.* As discussed below, we interpret “is fastened on.”

Further, within the context of Remacro’s Contingent Motion to Amend, Remacro presents an issue about written description support for a

⁵ L&P notes that this claim term lacks antecedent basis, and proposes that the correct interpretation is “motor.” Pet. 22.

⁶ L&P presents the grounds under both a broad and a narrow interpretation of this claim term. In the broad interpretation, L&P asserts that “connected” encompasses both rotational and fixed (non-rotational) connections. Pet. 23–24. In the alternative narrower interpretation, “connected” is limited to rotational connections. Pet. 24.

⁷ L&P interprets this limitation in light of the Specification as referring to a crossbeam that remains static as the electric actuator unfolds the mechanical stretching apparatus. Pet. 33.

⁸ L&P interprets both rotor shafts, in light of dependent claim 3, to encompass a bolt. Pet. 22, 38–39.

new limitation added to proposed substitute claim 4 that requires interpretation of “the motor.” RMTA 8 (identifying written description support for “a bolt connection” limitation).

In light of the issues presented by the parties, we construe below four claim terms.

1. “the motor head”

Claim 1 recites, “the motor head is rotationally connected through a second rotor shaft to the motor head fixing part.” Ex. 1001, 4:51–53. The ’949 patent describes that motor 6 has a motor head rotationally connected through second rotor shaft 4 to motor head fixing part 7. *Id.* at 3:59–62. The motor head is not specifically numbered in the figures of the ’949 patent; however, Figure 4 shows motor head fixing part 7 fastened to a portion of motor 6 via second rotor shaft 4. Based on this depiction and the description in the Specification, we understand that the motor head is a portion of motor 6. Thus, we agree with L&P that “the motor head” refers to a part of the claimed “motor.”

2. “the motor”

Claim 1 recites “the motor adopted is a motor with a guide rail.” Ex. 1001, 4:47–51. The ’949 patent similarly describes that “the motor adopted is a motor with a guide rail 22” and that the motor has “a motor head.” *Id.* at 3:32–33. Thus, we understand the “motor” of claim 1 comprises a motor head and a guide rail.

At the oral argument, Remacro argued that the motor movable slider also is part of the claimed motor. Tr. 19:26–20:15. Remacro’s interpretation is not supported by the intrinsic evidence. The ’949 patent describes that “an electric actuator consists of a motor 6, a motor connecting

tube 2, a motor movable slider 5 and a motor head fixing part 7.” Ex. 1001, 3:30–32. The ’949 patent further describes that “the motor movable slider 5 moves on the guide rail 22 of the motor 6.” *Id.* at 3:47–48. Thus, the ’949 patent describes motor movable slider 5 as being separate from motor 6. Similarly, claim 1 recites the motor movable slider and the motor as separate components of the electric actuator, i.e., “the electric actuator consists of a motor, a motor connecting tube, a motor movable slider, and a motor head fixing part, the motor adopted is a motor with a guide rail, the motor movable slider is installed on the guide rail of the motor.” *Id.* at 4:47–51. Thus, the motor movable slider is not encompassed by the recited “motor” of claim 1.

3. *“the motor head connecting tube is connected to the motor movable slider through a first rotor shaft”*

L&P presents its challenges based on two alternative interpretations of “connected.” Pet. 49. Under a first argument, L&P presents its challenge based on a broad construction of “connected” that encompasses a “fixed, non-rotational connection.” *Id.* In an alternative argument, L&P presents its challenge based on a narrower construction of “connected” as limited to a “rotational” connection. *Id.* at 49–54.

Based on the record before us, we disagree with L&P’s broad interpretation of “connected” to encompass a fixed, non-rotational connection. Such an interpretation fails to consider the surrounding language of the claim, which calls for the motor connecting tube to be connected to the motor movable slider “through a first rotor shaft.” L&P fails to address the import of the connection being by means of a “rotor shaft,” which term connotes a shaft about which a part rotates. L&P also fails to convince us that its proposed broader interpretation is reasonable

when the claim is read in light of the '949 patent, which describes the connection through the first rotor shaft as being a rotational connection. Ex. 1001, 3:45–47, 55–57 (describing motor head connecting tube 2 being “rotationally connected” to motor movable slider 5 through first rotor shaft 1); *id.* at 4:21–23 (describing “a manner of rotational connection of the first rotor shaft 1 . . . is achieved by means of bolt connection”). Thus, we do not adopt L&P’s proposed broad construction of “connected” to encompass a fixed, non-rotational connection. Rather, we agree with, and we analyze the asserted grounds using, L&P’s proposed narrower construction of “connected” as meaning a rotational connection.

Remacro argues that the language “the motor connecting tube is connected to the motor movable slider through a first rotor shaft” does not encompass an indirect connection of a motor connecting tube and a motor movable slider. PO Resp. 41. L&P replies that “Remacro advances no support for its position that an indirect connection cannot satisfy the ‘connected to’ portion” of the claim. Pet. Reply. 14. L&P argues that “[t]he ordinary meaning of ‘connected to’ encompasses indirect linkages.” *Id.* (quoting *Douglas Dynamics, LLC v. Buyers Prod. Co.*, 717 F.3d 1336, 1342 (Fed. Cir. 2013)).

We do not adopt Remacro’s proposed construction of “connected to” to exclude indirect connections because such an interpretation would be inconsistent with the '949 patent. As noted by L&P during oral argument, Remacro’s proposed interpretation is inconsistent with Figure 1 of the '949 patent, which shows “an indirect linkage between the motor connecting tube . . . and the motor movable slider . . .” Tr. 5:19–23 (referring to Figure 1 of the '949 patent). The '949 patent describes that Figure 1 is a “schematic

front view of an embodiment of the present invention when a leg part of a left side component or that of a right side component is completely folded.” Ex. 1001, 2:52–54. Figure 1 of the ’949 patent shows two pieces that reside between the motor connecting tube and the motor movable slider. Thus, we do not adopt Remacro’s proposed construction of “connected to” to exclude indirect connections because such an interpretation would be inconsistent with the ’949 patent. Accordingly, for the reasons given above, we construe “connected” to mean a direct or indirect rotational connection.

4. *“is fastened on”*

Claim 1 recites that “the motor connecting tube is fastened on the mechanical stretching apparatus.” Ex. 1001, 4:55–57. Claim 2 further recites that “said motor connecting tube is fastened on a linkage part of the mechanical stretching apparatus.” *Id.* at 4:59–61. Remacro asserts that the phrase “is fastened on” should be construed as “is fixed to.” PO Resp. 15.

We find that Remacro’s interpretation improperly imports limitations from an embodiment depicted in the patent into the claim language. Figure 4 of the ’949 patent shows an embodiment in which one end of motor connecting tube 2 is fastened on linkage part 3 using two bolts. *Id.* at 4:24–27, Fig. 4. The use of two bolts creates a fixed relationship between motor connecting tube 2 and linkage part 3. The ’949 patent describes, however, an embodiment in which motor connecting tube 2 is “fastened through a bolt on a linkage part 3 of the mechanical stretching apparatus.” *Id.* at 3:36–38. The ’949 patent does not specify in this description whether the bolt is used for a fixed connection between linkage part 3 and motor connecting tube 2 or a rotational connection between these elements. Elsewhere, the ’949 patent describes that a rotational connection of elements of the actuator can

be achieved by a bolt connection, and further describes that “the motor connecting tube 2 is fastened on the linkage part 3 of the mechanical stretching apparatus by using a bolt.” *Id.* at 4:21–26.

We find that under the broadest reasonable interpretation, when read in light of the ’949 patent, “fastened on” is a generic term that encompasses both a fixed connection and a rotational connection. This understanding is consistent with the ’949 patent, which describes that the motor connecting tube can be fastened on using a single bolt. Tr. 26:11–17 (Remacro’s counsel acknowledging that the ’949 patent description that the motor connecting tube is fastened through a single bolt to the linkage part could be a rotational connection).

With these claim interpretations in mind, we now examine the grounds asserted in the Petition.

D. Obviousness over Lawson ’228 and Lawson ’498

1. Lawson ’228

Lawson ’228 discloses lifter-recliner-type seating unit 10 having linkage mechanism 100 that is powered by a linear actuator of motor assembly 300. Ex. 1004, 6:27–30. Figure 5 of Lawson ’228 is reproduced below.



FIG. 5.

Figure 5 shows a perspective view of the linear actuator of motor assembly 300, linkage mechanism 100, support assembly 600, and lift assembly 700 in a reclined position. *Id.* at 4:21–24, 57–61. Linkage mechanism 100 includes footrest assembly 200, seat mounting plate 400, base plate 410, and seat-adjustment assembly 500. *Id.* at 6:34–37.

Support assembly 600, which serves as a foundation that rests on a surface underlying the seating unit, includes front lateral member 610, rear lateral member 620, left longitudinal member 630, and right longitudinal member 640. *Id.* at 7:19–23. Front and rear lateral members 610, 620 are crossbeams that span between and couple together left and right longitudinal members 630, 640. *Id.* at 7:27–30. Lawson ’228 teaches that the members of support assembly 600 “may be formed from square metal tubing, or any other material used in the furniture-manufacturing industry that exhibits rigid properties.” *Id.* at 7:24–26.

The “linear actuator” is comprised of motor mechanism 320, track 330, and motor activator block 340. *Id.* at 7:61–63. Linear actuator of motor assembly 300 provides powered adjustment of linkage mechanism 100 between reclined, extended, and closed positions. *Id.* at 7:50–53. Linear actuator of motor assembly 300 also provides powered adjustment of lift assembly 700 into and out of a seat-lift position, while holding linkage mechanism 100 in the closed position. *Id.* at 7:53–56.

Motor assembly 300 includes rear motor bracket 315, motor mechanism 320, front motor bracket 325, track 330, and motor activator block 340. *Id.* at 7:56–58. The linear actuator is coupled to linkage mechanism by front motor bracket 325 and is coupled to support assembly 600 by rear motor bracket 315. *Id.* at 7:61–65. Specifically, motor activator block 340 is fixedly coupled to front motor bracket 325 by fasteners and is pivotably coupled to motor swing bracket 470 of seat adjustment assembly 500 via front motor bracket 325. *Id.* at 8:1–5. A housing of motor mechanism 320 is pivotably coupled to rear lateral member 620 of support assembly 600 via rear motor bracket 315. *Id.* at 7:65–8:1. Lawson ’228 describes that front motor bracket 325 “functions as a crossbeam” and “may be fabricated from metal stock (e.g., formed sheet metal).” *Id.* at 8:14–16. Lawson ’228 teaches that “any suitable rigid or sturdy material known in the furniture-manufacturing industry may be used in place of the materials described above.” *Id.* at 8:19–23.

Figures 1–4, reproduced below, show seating unit 10 in various positions.

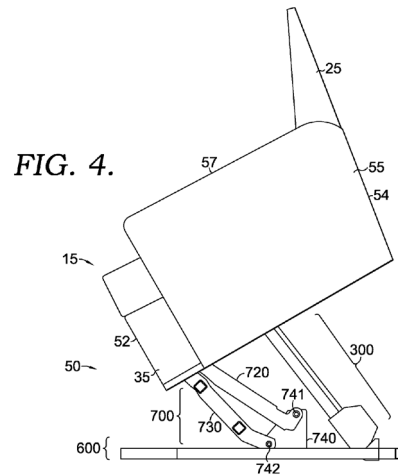
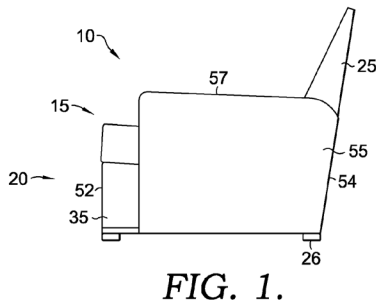
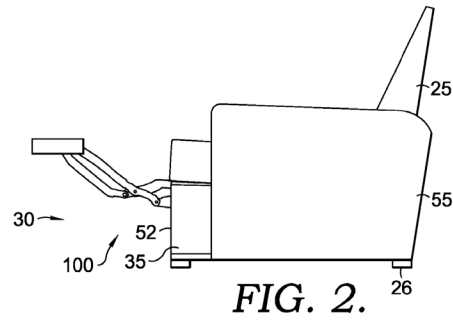
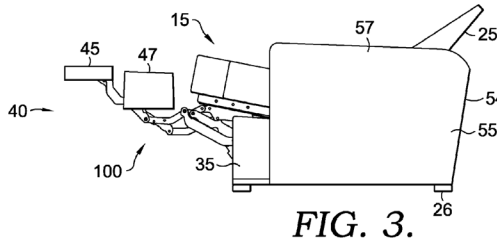


Figure 3 shows seating unit 10 in reclined position 40. *Id.* at 5:59–60.

Figure 2 shows seating unit 10 in extended position 30. *Id.* at 5:42–43.

Figure 1 shows seating unit 10 in closed position 20. *Id.* at 5:31–32.

Figure 4 shows seating unit 10 in seat-lift position 50. *Id.* at 6:13–14.

In reclined position 40, motor activator block 340 is positioned in a rearmost position of first travel section 331 of track 330, nearest to motor mechanism 320. *See id.* at 8:24–41 (describing generally the movement of motor activator block 340 along track 330 during various phases of movement), Fig. 5. During a first-phase movement, motor activator block 340 translates along first travel section 331 of track 330, which causes first-phase movement of motor swing bracket 470 to control adjustment of seat-adjustment assembly 500 from a fully reclined position 40 to extended

position 30. *Id.* at 8:60–67. Once the stroke of the first phase is substantially complete, a second-phase movement may occur, during which motor activator block 340 translates along second travel section 332 of track 330, which causes second-phase movement of motor swing bracket 470 to control adjustment of footrest assembly 200 from extended position 30 to closed position 20. *Id.* at 9:5–19. Once the stroke of the second phase is substantially complete, a third-phase movement may occur, during which motor activator block 340 translates along third travel section 333 of track 330, and invokes adjustment of lift assembly 700 from a collapsed closed position 20 to an expanded seat-lift position 50. *Id.* at 9:35–55.

2. *Lawson '498*

Lawson '498 describes a seating unit that includes a linkage mechanism and two linear actuators for automating adjustment of the linkage mechanism. Ex. 1003, Abstract, 1:66–2:1 (describing “a simplified lifter-recliner linkage mechanism that can be assembled to a pair of compact motors”). Figures 5 and 6 of Lawson '498 are reproduced below.

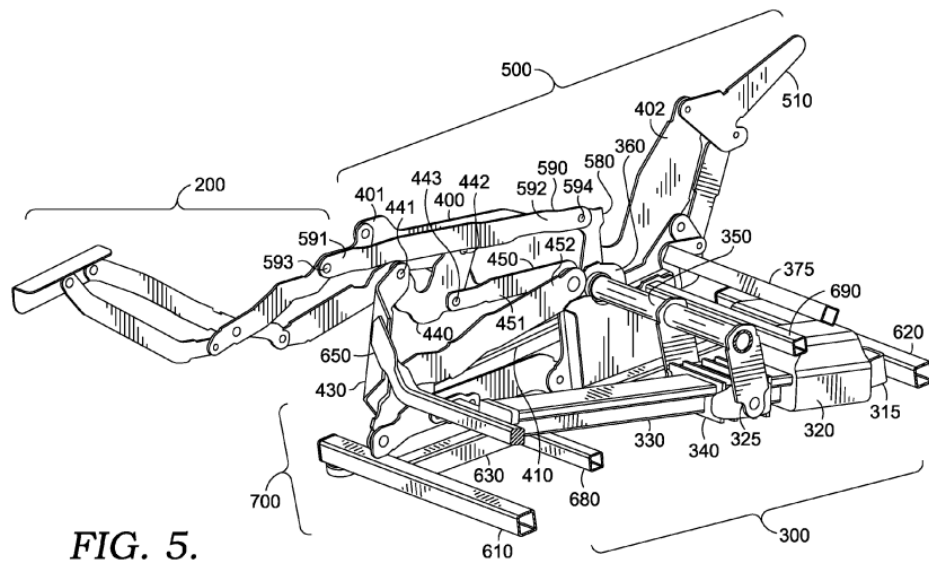


FIG. 5.

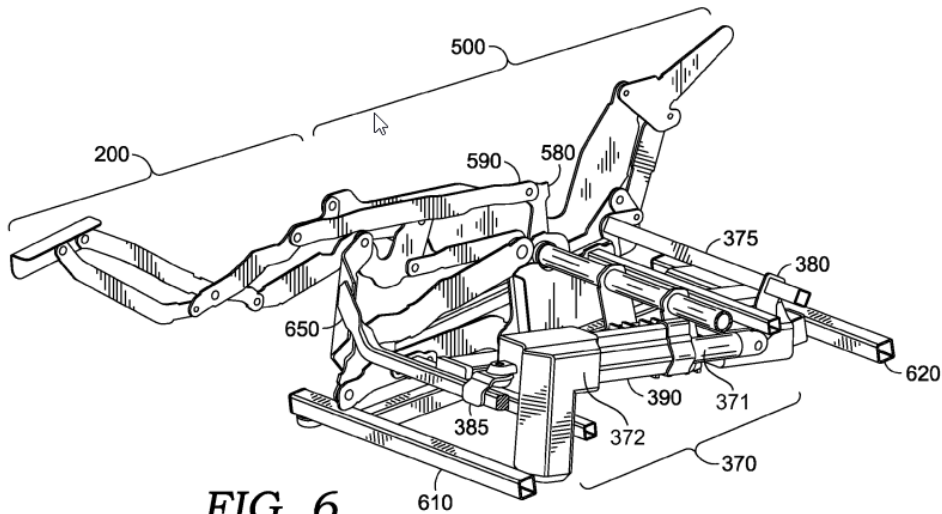


FIG. 6.

Figure 5 is a perspective view of a linkage mechanism in the reclined position illustrating first linear actuator 300 for adjusting the seating unit. *Id.* at 4:36–39. Figure 6 is a view similar to Figure 5, but illustrating first and second linear actuators 300 and 370, respectively, for adjusting the seating unit. *Id.* at 4:40–43. Actuator 300 includes motor activator block 340 that is pivotably coupled to front motor bracket 325 by way of rotational components (bearings), where front motor bracket 325 is fixedly attached to a mid-section of activator shaft 350. *Id.* at 10:41–45. Both ends of activator

shaft 350 are rotationally connected to a respective base plate 410 via a rotatable interface at activator mounting plate 360. *Id.* at 8:56–60, 10:48–57.

Lawson '498 describes seating unit 10 having lift-base assembly 600 that rests on an underlying surface, at least one linkage mechanism 100, at least one lift assembly 700, first motor assembly 300, and second motor assembly 370. *Id.* at 5:49–54. Figures 1–4, reproduced below, show seating unit 10 in various positions.

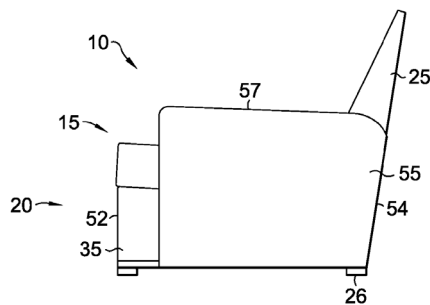


FIG. 1.

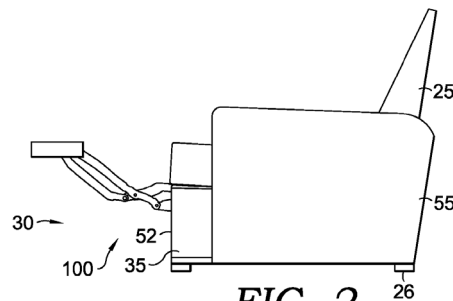


FIG. 2.

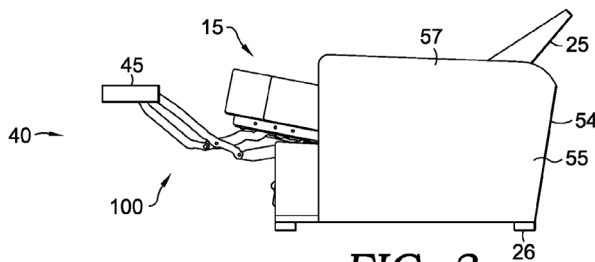


FIG. 3.

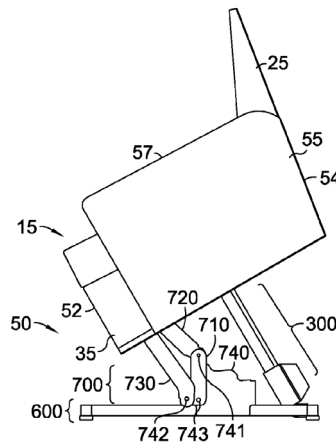


FIG. 4.

Figure 1 shows seating unit 10 in closed position 20. *Id.* at 6:23–24. Figure 2 shows seating unit 10 in extended position 30. *Id.* at 6:34–35. Figure 3 shows seating unit 10 in reclined position 40. *Id.* at 6:50–51. Figure 4 shows seating unit 10 in seat-lift position 50. *Id.* at 7:5–6. Lawson '498 describes that the geometry of linkage mechanism 100 accommodates

an innovative dual-motor design that allows seating unit 10 to remain positioned directly over a perimeter of lift-base assembly 600 through each adjustment of seating unit 10. *Id.* at 7:55–61.

Lawson '498 describes that first motor assembly 300 provides powered adjustment of linkage mechanism 100 between extended position 30 and closed position 20 and powered adjustment of lift assemblies 700 into and out of seat-lift position 50 while holding the linkage mechanism in the closed position. *Id.* at 10:16–24. Lawson '498 describes that second motor assembly 370 provides powered adjustment of linkage mechanism 100 between extended position 30 and reclined position 40. *Id.* at 10:60–64.

3. *Claim 1*

L&P sets forth how the combination of Lawson '228 and Lawson '498 discloses each limitation in claim 1. Pet. 41–54. L&P also sets forth reasons to combine Lawson '228 and Lawson '498. *Id.* With the exception of limitations 1c, 1i, and 1j, which we discuss below, Remacro does not challenge L&P's contention that—if combined, an issue we will address further below—the combination of Lawson '228 and Lawson '498 discloses all of the limitations of claim 1. For the reasons provided below, we are persuaded that the combination discloses all of the limitations of claim 1.

a. Limitations 1a, 1b, 1d, 1e, 1f, 1g, and 1h

L&P contends that Lawson '228 discloses limitations 1a, 1b, 1d, 1e, 1f, 1g, and 1h of claim 1. Pet. 41–43, 45–48. Remacro does not contest L&P's assertions that Lawson '228 discloses these limitations. PO Resp. 22–50.

Specifically, L&P contends, and we agree with the following: Lawson '228 discloses an electromechanical stretching apparatus of a convertible sofa consisting of a mechanical stretching apparatus (linkage mechanism 100) and an electric actuator (linear actuator within motor assembly 300) [limitation 1a].⁹ Pet. 41–42 (citing Ex. 1004, Abstract, 1:18–22, 2:25–30, 5:28–31, 6:28–31, 7:41–44, 7:45–53, Fig. 5). Lawson '228's mechanical stretching apparatus (linkage mechanism 100) is provided with an electrically-driven connecting rod (rear lateral member 620) [limitation 1a]. *Id.* at 42 (citing Ex. 1004, 7:18–33, 7:41–44, Fig. 5). Lawson '228's electrical actuator consists of a motor (motor mechanism 320 of motor assembly 300) [limitation 1b] with a guide rail (track 330) [limitation 1f], a motor movable slider (motor activator block 340) [limitation 1d], and a motor head fixing part (rear motor bracket 315) [limitation 1e], with the motor movable slider (block 340) installed on the guide rail (track 330) [limitation 1g]. *Id.* at 43 (citing Ex. 1004, 7:56–67, Fig. 5), 45–47 (citing Ex. 1004, 7:56–8:1, 8:24–32, 8:42–50; Fig. 5). Lawson '228's motor head (motor mechanism 320) is rotationally connected through a second rotor shaft to the motor head fixing part (rear motor bracket 315) [limitation 1h], because the housing of motor mechanism 320 is “pivotally coupled” to rear lateral member 620 via rear motor bracket 315 and Lawson '228 describes that pivotal couplings may include bolts. *Id.* at 47–48 (citing Ex. 1004, 6:57–64, 7:56–8:1, Fig. 5). Thus, based on our review of the evidence of record, L&P has shown that Lawson '228 discloses the above-discussed limitations.

⁹ Regardless of whether the preamble is limiting, L&P has shown that the recitation in the preamble is satisfied by the prior art.

b. Limitation 1c

L&P contends that Lawson '228's electrical actuator includes a motor connecting tube (front motor bracket 325) [limitation 1c]. *Id.* at 43 (citing Ex. 1004, 7:56–58, 8:5–23, Fig. 5). Specifically, L&P alleges that although Lawson '228 shows front motor bracket 325 “as metal stock (e.g., formed sheet metal)” in Figure 5, Lawson '228 “clearly discloses that the front motor bracket could be formed from ‘any suitable rigid or sturdy material known in the furniture-manufacturing industry.’” *Id.* (quoting Ex. 1004, 8:14–23). L&P states that “[i]t is well known in the furniture-manufacturing industry for plates, bars, rods, and tubes to interchangeably be used as crossbeams connecting mirror-image linkage mechanisms.” *Id.* at 43–44 (citing Ex. 1004, 7:24–30, 8:14–16; Ex. 1005 ¶ 54). L&P asserts that Lawson '228 “contemplates the interchangeable shape of the front motor bracket 325.” *Id.* at 44 (citing Ex. 1004, 6:63–65).

Based on our review of the evidence of record, we find that Lawson '228 suggests front motor bracket 325 may be made from a “tube” instead of formed metal stock. Lawson '228 explicitly teaches that “the shapes of . . . the brackets may vary as desired.” Ex. 1004, 6:63–64; Ex. 1005 ¶¶ 54, 66. Further, Lawson '228 teaches that front motor bracket 325 functions as a “crossbeam.” Ex. 1004, 8:14–16; Ex. 1005 ¶¶ 54, 66. Elsewhere, Lawson '228 teaches that another crossbeam, i.e., rear lateral member 620, may be formed from square metal tubing. *Id.* at 7:24–30. The Petition and L&P's expert point to these disclosures in Lawson '228 as evidentiary support for the proposition that it was well known to one having ordinary skill in the art “for plates, bars, rods, and tubes to interchangeably be used as crossbeams connecting mirror-image linkage mechanisms.” Pet.

18–19; Ex. 1005 ¶¶ 47, 54, 66. Based on the portions of Lawson ’228 cited above, L&P has shown that Lawson ’228 teaches: (1) its front motor bracket 325 functions as a crossbeam, (2) bracket 325 could be made in other shapes, and (3) other crossbeams in the assembly are made from square tubing. Thus, we find adequate evidence to support L&P’s assertion of interchangeability for purposes of institution.

Remacro argues that Lawson ’228 does not disclose or render obvious a “motor connecting tube” because its front motor bracket 325 is a bracket that “has this particular form for stability and to provide for an easy, stable, fixed connection to the motor movable slider that can accommodate a pivot connection to the linkage assemblies at either end.” PO Resp. 35 (citing Ex. 2010 ¶ 46). Although we agree with Remacro that a bracket is not a tube, and that Lawson ’228 depicts a bracket, we disagree with Remacro’s implication that Lawson ’228 limits the shape of this crossbeam to the shape shown in the figures. As noted above, Remacro explicitly teaches that the shape of bracket 325 can “vary as desired.” Ex. 1004, 6:63–64.

Remacro further argues that the disclosure in column 8, lines 15–23 of Lawson ’228, on which L&P relies for a suggestion to replace motor bracket 325 with a tube, is “talking about the choice of material not the choice of structure.” PO Resp. 35 (citing Ex. 2010 ¶ 46). We agree with Remacro that this portion of Lawson ’228 describes that bracket 325 may be fabricated from metal stock, e.g., formed metal sheet. Ex. 1004, 8:14–16. Lawson ’228’s suggestion that “any suitable rigid or sturdy material . . . may be used in place of the materials described above” appears to suggest that one could fabricate the bracket from materials other than metal stock.

Although this disclosure in Lawson '228 does not suggest that a tube is a known alternative to a bracket, L&P's assertion of interchangeability is not based solely on this portion of Lawson '228. As noted above, Lawson '228 further discloses that bracket 325 functions as a crossbeam, and Lawson '228 discloses other components that likewise function as crossbeams and are formed from tubing, which we find sufficient to support L&P's assertion of interchangeability of a bracket and a tube. *See* Ex. 1004, 7:24–35 (describing that members 610 and 620 are formed of square metal tubing, serve as crossbeams, and are attached to a pair of lift pivot plates 740); *id.* at 8:14–15 (describing that front motor bracket 325 functions as a crossbeam); *id.* at 13:45–50 (describing that front and rear traverse beams 731 and 732 function as a set of crossbeams and may be formed from square metal tubing).

Remacro further asserts that “not all ‘crossbeams’ are the same” and Lawson '228 does not teach that “all structures that span the lift assemblies can be made from square metal tubing.” PO Resp. 36 (citing Ex. 2010 ¶ 47); *see also id.* at 37 (citing Ex. 2010 ¶ 48) (arguing that Lawson '228 specifically calls the structure 325 a bracket and distinguishes it from other structures referred to as “beams” or “members”). The mere use in Lawson '228 of different terminology to distinguish between various crossbeams is not sufficient, without more, to suggest that a person having ordinary skill in the art would have been dissuaded from using a tube in place of a bracket for crossbeam 325. In fact, as noted by L&P, Lawson '228 suggests that “the shapes of the linkages and the brackets may vary as desired.” Ex. 1004, 6:63–64. A person having ordinary skill is “a person of ordinary creativity, not an automaton.” *KSR*, 550 U.S. at 421.

Such a person would understand, based on the suggestion in Lawson '228 to use other shapes for the brackets, and based on the disclosure in Lawson '228 to use square metal tubing for other crossbeams, that tubing of appropriate strength and stability could be used in place of a flat metal bracket to perform the functions of bracket 325. Ex. 1005 ¶¶ 54, 66; Ex. 2011, 58:2–59:11 (Dr. Stone testifying that using a bar, plate or rod versus a tube would not change the operation of the device and it is a matter of design choice because they accomplish the same function).

Notably, the opinion of Remacro's expert falls short of stating that one having ordinary skill in the art would have had no reasonable expectation of success in replacing bracket 325 with square metal tubing, as proposed by L&P. Rather, Remacro's expert opines only that the fact that another crossbeam can be made from square metal tubing does not mean that Lawson '228 teaches that all structures that span the lift assemblies can be made from square metal tubing. Ex. 2010 ¶ 47. Further, the opinion of Remacro's expert that "[a] person of ordinary skill in the art would understand that a 'bracket' as opposed to a 'beam' is not a tube and is not interchangeable with a tube simply because it spans the lift assemblies" is not supported by adequate evidence or reasoning to discern the basis for this opinion. *Id.* ¶ 48.

Remacro argues that because Lawson '228 describes "brackets" separately from "members" or "beams," Lawson '228's disclosure that the shape of a bracket can vary does not suggest that the shape can change so much as to replace the bracket with a tube. PO Resp. 37 (citing Ex. 2010 ¶ 48). Again, Remacro's argument misses the point that a person having ordinary skill in not an automaton. We find adequate evidence in Lawson

'228's characterization of "brackets," "members," and "beams" as all functioning as crossbeams to suggest to a person having ordinary skill in the art that the shape of the bracket could include shapes of other disclosed crossbeams.

Remacro further argues that L&P "does not provide any details as to why it is desired to change the shapes of the front motor bracket 325 to a tube." *Id.* at 37. L&P's expert opines that one having ordinary skill in the art would have known that bars, plates, rods, and tubes are interchangeable as used for a crossbeam. Ex. 1005 ¶¶ 54, 66. Under these circumstances, L&P's reasoning is sufficient to support a determination of obviousness. *See KSR*, 550 U.S. at 416 ("[W]hen a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result."). The Court in *KSR* explained that an obviousness analysis must provide some articulated reasoning with rational underpinning to explain an apparent reason to combine the known elements in the fashion claimed when the claimed subject matter involves "more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement." *Id.* at 417–18. Here, L&P relies on a simple substitution, i.e., interchangeability, of one shape crossbeam for another, and thus no further reasoning is necessary in this case to support an assertion of obviousness.

Remacro further attacks the sufficiency of L&P's evidence, arguing that Dr. Stone "fails to show that the motor bracket equates to the motor connecting tube." PO Resp. 37–38, 42 (citing Ex. 1005 ¶¶ 54, 66). As L&P makes clear in its papers, however, the evidence supporting Dr. Stone's

testimony is contained within the disclosure of Lawson '228 itself, which shows crossbeams of different shapes. Pet. 18–19 (citing Ex. 1004, 6:63–65, 7:24–30, 8:14–16); Ex. 1005 ¶¶ 47, 54, 66 (citing Ex. 1004, 6:63–65, 7:56–58, 8:11–16); Reply 9 (relying on Lawson '228's express teachings).

As an alternative theory of obviousness, L&P also asserts that Lawson '498 discloses a motor connecting tube and that it would have been obvious to one having ordinary skill in the art to modify Lawson '228's front motor bracket 325 to be tubular in shape based on the teaching of Lawson '498. Pet. 34, 44 (citing Ex. 1003, Fig. 5; Ex. 1005 ¶¶ 66, 67). As discussed further below, we agree with L&P that Lawson '498's activator shaft 350 is a tube, and that this disclosure provides further support for L&P's position that brackets and tubes were known at the time of the invention to be interchangeable.

Remacro argues that Lawson '498 does not disclose the motor connecting tube. PO Resp. 42. Specifically, Remacro argues that Lawson '498's activator shaft 350 “is a shaft not a tube because the shaft 350 is solid, not hollow.” *Id.* at 40 (citing Ex. 2010 ¶ 61). Remacro argues that shaft 350 is solid because “Lawson '498 distinguishes between a tube and a shaft and the structure connected to the motor movable slider is a shaft.” *Id.* Remacro's expert, however, fails to address Lawson '498's depiction of shaft 350 as hollow in Figure 5. Also, Remacro's expert provides no evidence to support the testimony that a “shaft,” as that term would be understood by one having ordinary skill in the art, cannot be hollow. In fact, during oral argument, Remacro's counsel admitted that shaft 350 could be hollow. *See* Tr. 31:2–4 (Remacro's counsel arguing that shaft 350 in Figure 5 is “either hollow or could be solid”).

Further, Figure 5 of Lawson '498 depicts only a portion of shaft 350 taken approximately two-thirds of the way along shaft 350. Ex. 2011, 40:1–14 (Dr. Stone testifying during deposition that the right third of shaft 350 is not shown in Figure 5).¹⁰ Thus, the end of shaft 350 shown in Figure 5 is a cross-section of the shaft. We find that this cross-section shows crosshatching along the outer rim of shaft 350 and depicts no crosshatching in the hollow center of the shaft. See Reply 7 (annotated Figure 5 of Lawson '498). The fact that Lawson '498 refers to activator shaft 350 as a “shaft” and other components as “tubes” does not provide adequate evidence to find, in direct contradiction to the depiction in Figure 5, that the activator shaft 350 is solid. Thus, we agree with L&P that Lawson '498 discloses an activator shaft 350 that is shown as tubular in shape.

As discussed above, L&P asserts that it would have been obvious to modify Lawson '228's bracket to be a tube because it was known that tubes and brackets were interchangeable for use as crossbeams. Ex. 1005 ¶¶ 66–67. L&P's further reliance on the tube disclosed in Lawson '498 as evidence of this known interchangeability further bolsters L&P's position. Thus, for the same reasons provided above, we find that L&P has provided adequate reasoning as to why the claimed motor connecting tube would have been obvious in light of the suggestions of using tubing as crossbeams in Lawson '228 and the disclosure of a motor connecting tube in Lawson '498.

¹⁰ We refer to the page numbers provided by Remacro in the bottom right corner of each page of Exhibit 2011, and not the page numbers at the top of each page.

c. Limitation Ii

L&P also contends, under a first broad construction of “connected,” that Lawson ’228 discloses that the motor movable slider (motor activator block 340) is coupled to the motor connecting tube (front motor bracket 325) by way of a first rotor shaft (fasteners). Pet. 49 (citing Ex. 1004, 8:1–5). As discussed above in section II.C.3, we do not adopt L&P’s broad construction of “connected . . . through a first rotor shaft” as encompassing a “fixed, non-rotational connection.” Thus, we disagree with L&P’s contention that a fixed connection is a connection through a rotor shaft. L&P has not shown that Lawson ’228 explicitly discloses “the motor connecting tube is connected to the motor movable slider through a first rotor shaft,” as recited in challenged claim 1.

Alternatively, L&P contends, under a second narrower construction of “connected,” that it would have been obvious to one of ordinary skill in the art to modify the fixed coupling between front motor bracket 325 and motor activator block 340 of Lawson ’228 with the pivotal coupling of Lawson ’498. *Id.* at 51–54. L&P contends that Lawson ’498 discloses first motor assembly 300 “that is much the same as” motor assembly 300 of Lawson ’228, except that Lawson ’498 teaches that motor activator block 340 may be pivotally coupled to front motor bracket 325 through a first rotor shaft. *Id.* at 52 (citing Ex. 1003, 10:24–28, 41–43). Based on these disclosures in Lawson ’498, L&P contends:

A person of ordinary skill in the art would have understood, at the time the invention was made, that the fixed coupling between the front motor bracket 325 and the motor activator block 340 of Lawson ’228 could easily be replaced with the pivotal coupling between the front motor bracket 325 and the motor activator block 340 of Lawson ’498.

Id. (citing Ex. 1005 ¶ 73). L&P contends that the capabilities or functions of the combination were predictable. *Id.* at 52–53 (citing Ex. 1005 ¶ 73).

Specifically, in the expert testimony cited in the Petition, Dr. Stone states:

Because of the high degree of similarity of the linkage mechanism of Lawson '498 to that of Lawson '228, it would have been very easy for one of skill in the art to understand that the pivotal coupling of Lawson '498 could have been used in Lawson '228. This would have been a predictable modification having predictable results.

Ex. 1005 ¶ 73.

L&P contends that the modification “would be nothing more than using a prior art element predictably according to its established function.”

Pet. 53; *see also id.* at 54 (citing Ex. 1005 ¶¶ 68–74). Dr. Stone further explains:

Many links of the linkage mechanisms of the two prior art references are similarly connected such that one of ordinary skill in the art could easily envision substituting certain connection types or linkage connections for others, while maintaining an expectation that the resulting modified linkage mechanism would operate in the same way.

Ex. 1005 ¶ 74. As in the previous proposed modification, we understand L&P’s position to be that the proposed modification is nothing more than the simple substitution of one connection type (fixed) for another connection type (rotatable) known in the field, where the combination yields a predictable result.

Remacro does not contest L&P’s assertion that Lawson '498 discloses motor activator block 340 may be pivotally coupled to front motor bracket 325 through a first rotor shaft. Instead, Remacro argues that L&P “fails to articulate any reason, motivation, or rational underpinning to support its arguments, rendering its obviousness analyses inadequate.” PO Resp. 27.

During the deposition of L&P's expert, Dr. Stone, he testified that the proposed modification to replace the fixed connection between bracket 325 and block 340 of Lawson '228, with a tube that is pivotably connected to the slider, as taught in Lawson '498, would be "essentially the same" and "accomplish the same function or operation." *Id.* at 28 (quoting Ex. 2011, 59:4–11). Remacro argues that Dr. Stone's asserted admission as to lack of advantages of the proposed modification means that L&P failed to satisfy the requirement to identify a motivation to combine. *Id.* at 28 (arguing that Dr. Stone must have based his opinions on hindsight).

We disagree with Remacro's characterization of L&P's obviousness position. As explained above, as in the case here of a simple substitution of one known element for another element known in a predictable art, where the substitution involves a trivial modification that yields a predictable result (*see* Ex. 1005 ¶¶ 68–74), the law does not require elaborate explication of a reason to modify. *See KSR*, 550 U.S. at 417–418 (the Court requiring articulation of a reason to combine when the claimed subject matter involves *more than* the simple substitution of one known element for another).

Further, contrary to Remacro's argument that Dr. Stone's testimony as to lack of advantages of the proposed substitution is evidence of failure to identify a reason to modify, the Court in *U.S. v. Adams*, 383 U.S. 39, 50 (1966), discussed with approval in *KSR*, 550 U.S. at 416, noted that modification of an element of a device with an equivalent substitution indeed leads to a resulting device with equivalent operating characteristics. In other words, had Dr. Stone testified that the proposed modification to Lawson '228 with the pivotal coupling of Lawson '498 would have achieved some specific advantage, then the substitution would have been more than a

simple substitution of one element for another known in the art leading to predictable results. That is not the case here because, as Dr. Stone recognized, the proposed modifications involve substitutions of equivalent elements known in the art. Ex. 1005 ¶¶ 66–74. Certainly the lack of an advantage from substituting a bracket with a tube, or from substituting a fixed connection with a pivotal connection, does not confer patentability upon an invention over such close prior art.

Remacro argues that “[a]n obviousness finding cannot stand without providing some reason or motivation to modify or combine the prior art’s teachings.” PO Resp. 23 (citing *Ferring B.V. v. Watson Labs, Inc.-Florida*, 764 F.3d 1401, 1407 (Fed. Cir. 2014); *Star Sci., Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1375 (Fed. Cir. 2011)).¹¹ The cases relied on by Remacro are distinguishable from the obviousness inquiry at issue here. The proposed combination of prior art teachings at issue in *Ferring* was not based on simple substitution of one element for another element known in the art to yield predictable results. Rather, *Ferring* addressed obviousness of a pharmaceutical formulation for treatment of a condition, where “the cited prior art references neither set forth the limitations required by the asserted claims, nor provided any reason or motivation to combine those teachings to derive the claimed formulations with specific dissolution profiles.” *Ferring*, 764 F.3d at 1407 (noting the prior art did not disclose the claimed 650 mg formulation, the claimed amounts of modified release polymers, and the

¹¹ Remacro also cites Federal Circuit obviousness decisions addressing hindsight that were issued prior to the Supreme Court’s decision in *KSR*. PO Resp. 24 (citing *In re Kahn*, 441 F.3d 977 (Fed. Cir. 2006) and *In re Fine*, 837 F.2d 1071 (Fed Cir. 1988)). We focus our analysis above on *KSR* and its progeny.

claimed critical dissolution limitations). The court also weighed supporting evidence demonstrating a long-felt, but unmet, need for treatment of the condition that avoided adverse events, to reach its determination of non-obviousness. *Id.*

Likewise, the proposed combination of prior art teachings at issue in *Star Scientific* was not based on simple substitution of one element for another element known in the art to yield predictable results. Rather, in *Star Scientific*, the claimed invention pertained to a process of substantially preventing the formation of at least one nitrosamine in harvested tobacco plants, and the court affirmed the district court's determination of non-obviousness because even if the teachings of the prior art were combined, the art "fail[ed] to teach the claim limitation of curing with 'air free of combustion gases.'" *Star Sci.*, 655 F.3d at 1376. As in *Ferring*, the court in *Star Scientific* also weighed evidence of secondary considerations that supported non-obviousness. *Id.*

Remacro further argues that to find claims unpatentable as obvious, there must have been a reason for a skilled artisan to combine the references to achieve the claimed invention. PO Resp. 24–25 (citing *Forest Labs., LLC v. Sigmapharm Labs., LLC*, 918 F.3d 928, 934 (Fed. Cir. 2019); *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016)). Similar to the discussion above, these cited cases do not discuss obviousness of a claimed invention based on a simple substitution of one element for another known in the art to achieve predictable results. Thus, the specific analyses of the sufficiency of the obviousness showings in these cases bear little relevance to the facts presented here.

Remacro argues that “[s]imply parroting the language of the legal authority is insufficient to support an obviousness challenge.” PO Resp. 25 (citing *Apple Inc. v. ContentGuard Holdings, Inc.*, IPR2015-00442, Paper 9 at 15–16 (PTAB July 13, 2015); *Qualcomm, Inc. v. ParkerVision, Inc.*, IPR2015-01822, Paper 8 at 17 (PTAB Mar. 8, 2016)); *see also id.* at 25–26 (citing additional Board decisions either denying institution or rejecting an obviousness challenge for failure of L&P to provide a sufficient reason for the proposed modification to the art). L&P went beyond simply parroting language from case law to support its obviousness challenge. For instance, Dr. Stone testifies that the connection between Lawson ’228’s front motor bracket 325 and motor activator block 340 is fixed and the connection between front motor bracket 325 and linkage mechanism 100 is rotatable through pivot point 475. Ex. 1005 ¶ 70. Dr. Stone opines:

Upon having reviewed Lawson ’228, including how the various links are connected to one another, it is obvious to me that one could have made the connection between the motor activator block 340 and the front motor bracket 325 rotatable, and the connection between the front motor bracket 325 and the linkage mechanism 100 fixed, and the linkage mechanism of Lawson ’228 would have operated in the same way, having the same overall degree of freedom.

Id. Dr. Stone explains that “[i]t would have been obvious to swap the types of connections in these two locations of the linkage mechanism, as both types (e.g., fixed and rotatable) are well known generally, but particularly well known in the furniture manufacturing industry for connecting a linear actuator to a crossbeam.” *Id.* ¶ 71. Dr. Stone explains that “[h]ere, the use of a fixed or rotatable coupling/connection is a design choice and does not affect the operation of the linkage mechanism” and that “[s]ubstituting the

fixed connection of Lawson '228 for the rotatable connection in the '949 patent would have been a simple design choice.” *Id.* ¶ 72.

Remacro contests Dr. Stone’s testimony, arguing that “there is no reason to replace the fixed connection between the bracket and the motor activator block [of Lawson '228] with a rotatable connection, and replace the pivotal connection between the bracket and the linkage mechanism with a fixed connection” and that “doing so would decrease the stability and operability of the assembly” and “would make the assembly more complicated, which Lawson '228 specifically teaches away from.” PO Resp. 45 (citing Ex. 2010 ¶ 51 (citing Ex. 1004, 2:13–18)). Remacro relies on the testimony of its expert, Dr. Cameron. *Id.* Dr. Cameron does not, however, explain why the modification proposed by Dr. Stone would decrease the stability and operability of the assembly. Ex. 2010 ¶ 51 (providing a conclusory assertion that modification of the fixed connection to make it rotatable would decrease stability and operability of the assembly without further explanation or reasoning).

Further, and importantly, Dr. Cameron’s testimony appears to be based on a different modification than that proposed and addressed by Dr. Stone and discussed in Remacro’s Response. Dr. Cameron’s testimony about a decrease in stability and operability is based on a modification in which only the fixed connection between the bracket and the motor activator block is replaced with a rotatable connection. *Id.* (omitting mention of the further modification to replace the pivotal connection between the bracket and the linkage mechanism with a fixed connection). For these reasons, we accord little weight to Dr. Cameron’s testimony because it does not address the proposed modification presented by L&P and because it does not provide

reasoning or explanation of the basis for Dr. Cameron's statement. *See* 37 C.F.R. § 42.65(a) (2018) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

Remacro argues that the Petition "never shows how these aspects of the prior art would be modified or combined, what the resulting device would look like, or how it would operate." PO Resp. 31. L&P's expert explains, however, that the linkage mechanism of Lawson '498, which bears a high degree of similarity to the linkage mechanism of Lawson '228, shows how a pivotal coupling between front motor bracket 325 and motor activator block 340 could have been used in Lawson '228. Ex. 1005 ¶ 73. Dr. Stone further explains that both references are directed to linkage mechanisms for furniture, use linear actuators for automating adjustment of the linkage mechanism, and contain similar connections between many of the linkage mechanisms, such that one of ordinary skill in the art "could easily envision substituting certain connection types or linkage connections for others." *Id.* ¶ 74. Dr. Stone further testifies that a person of ordinary skill in the art would have had a reasonable expectation of success at making the proposed modifications to Lawson '228 in light of the similarity of the linkage mechanisms in the two references. *Id.* For these reasons, we find that Lawson '498 discloses limitation 1i, and that L&P has articulated adequate explanation as to why it would have been obvious to one having ordinary skill in the art to modify Lawson '228 to incorporate the teachings of Lawson '498 in the manner claimed. Further, we find that L&P has demonstrated that a person having ordinary skill in the art would have had a reasonable expectation of success in making this proposed modification.

d. Limitation Ij

As to the last element of claim 1, L&P contends that modifying Lawson '228 with Lawson '498 to replace the pivotal connection between bracket 325 and block 340 with a rotatable connection, would result in a further modification of Lawson '228 to replace the pivotal connection between the ends of bracket 325 motor swing bracket 470 of the linkage mechanism with a fixed connection. Pet. 49–51 (citing Ex. 1005 ¶¶ 55–59 (discussing modifying Lawson '228 to “swap” the pivotal and fixed connections of bracket 325 such that the fixed connection of the bracket to block 340 is made rotatable and the rotatable connection of the ends of the bracket to motor swing bracket 470 of the linkage mechanism are made fixed)); *see also id.* at 52–54 (citing Ex. 1005 ¶¶ 68–74 (discussing same)).

Remacro argues that “is fastened on” should be interpreted, in light of its plain and ordinary meaning, to mean “is fixed to.” PO Resp. 15–19. Even if we were to adopt Remacro’s proposed interpretation, as discussed above, L&P has demonstrated that were one to swap the pivotal and fixed connections of Lawson '228’s bracket, then the ends of the bracket would be fixedly attached to motor swing bracket 470 of the linkage mechanism.

Remacro argues that the Petition never explains why a person having ordinary skill in the art would have been led to modify the pivotal/rotatable connection between the seating assembly and the motor unit to be “fastened on.” *Id.* at 32. Specifically, Remacro argues that the Petition “fails to specify the motivation for a skilled artisan to modify the pivotal/fixed motor bracket connections in Lawson '228 to the ‘fastened on’/‘rotational’ connections recited by claim 1 of the '949 Patent.” *Id.*

We disagree. As discussed in detail above, L&P’s expert, Dr. Stone, provides a reason to modify the connection between Lawson ’228’s bracket 325 (as modified to be a motor connecting tube) and the slider to make it pivotal, as taught in Lawson ’498, and further explains that this proposed modification would require modification to the connection at the ends of Lawson ’228’s modified motor connecting tube to be fixed to the linkage member. Ex. 1005 ¶¶ 69–74.

That said, as explained above in Section II.C.4, we decline to adopt Remacro’s narrow definition of “is fastened on” to require a fixed connection. As noted above, Lawson ’228 teaches a pivotal connection between the ends of bracket 325 and motor swing bracket 470 of the linkage assembly. Ex. 1004, 11:16–20, Fig. 5. Thus, even were one not to modify Lawson ’228’s connection between the ends of bracket 325 and the linkage assembly to a fixed connection, the combination would nonetheless meet the language of claim 1, which requires only that the motor connecting tube is fastened on, and not non-rotatably fixed to, the mechanical stretching apparatus.

e. Conclusion as to Claim 1

Thus, based on our review of the evidence of record, we are persuaded that the Petition demonstrates by a preponderance of the evidence that claim 1 of the ’949 patent would have been unpatentable as obvious over the combined teachings of Lawson ’228 and Lawson ’498.

4. Claim 2

Claim 2 depends from claim 1 and recites “wherein said motor connecting tube is fastened on a linkage part of the mechanical stretching

apparatus.”¹² Ex. 1001, 4:58–61. As discussed above in the analysis of claim 1, L&P has shown that Lawson ’228 discloses that front motor bracket 325 is pivotally coupled to motor swing bracket 470 of linkage mechanism 100. Pet. 55. The motor swing bracket 470 of Lawson ’228 is a linkage part of the mechanical stretching apparatus. Ex. 1004, Fig. 5 (showing bracket 470 as part of linkage mechanism 100), 8:1–14 (describing that front motor bracket 325 is coupled to linkage mechanism 100 at motor swing bracket 470). Further, as discussed above, L&P has demonstrated that Lawson ’228, as modified by Lawson ’498, would result in the ends of bracket 325 being fixedly connected to motor swing bracket 470, such that claim 2 is rendered obvious even under Remacro’s construction of “fastened on” as being “fixed to.” Thus, based on our review of the evidence of record, we are persuaded that the Petition demonstrates by a preponderance of the evidence that claim 2 of the ’949 patent would have been unpatentable as obvious over the combined teachings of Lawson ’228 and Lawson ’498

5. *Claim 3*

Claim 3 depends from claim 1 or claim 2 and recites “wherein the first rotor shaft and the second rotor shaft are both a bolt.” Ex. 1001, 4:62–64.

As to the second rotor shaft, L&P asserts that Lawson ’228 shows a pivot point between motor mechanism 320 and rear motor bracket 315, which corresponds to the claimed “second rotor shaft.” Pet. 56 (citing Ex. 1004, Fig. 5). L&P further asserts that Lawson ’228 discloses that

¹² Remacro addresses the claims and grounds collectively in the Patent Owner Response and does not present separate arguments for dependent claims 2 and 3, apart from the arguments addressed above for claim 1. PO Resp. 14–16, 47–48 (addressing claims 1 and 2 together); *id.* at 11 (mentioning the limitations of claim 3).

pivotal couplings are illustrated as pivot points in the figures and that such pivotal couplings may include bolts or other suitable fasteners. *Id.* (citing Ex. 1004, 6:57–63).

The evidence supports L&P’s assertions. Lawson ’228 describes that motor mechanism 320 has a housing that is pivotally coupled to rear lateral member 620 via rear motor bracket 315. Ex. 1004, 7:61–8:1; Ex. 1005 ¶ 48. Lawson ’228 further describes that pivotal couplings can be achieved using bolts. Ex. 1004, 6:53–63; Ex. 1005 ¶ 49. Thus, L&P has shown that Lawson ’228 describes that the claimed “second rotor shaft” can be a bolt.

As to the first rotor shaft, L&P asserts that Lawson ’498 shows a pivot point between front motor bracket 325 and motor activator block 340, which corresponds to the claimed “first rotor shaft.” Pet. 56 (citing Ex. 1003, Fig. 5). L&P further asserts that Lawson ’498 discloses pivotal couplings that are illustrated as pivot points in the figures and that such pivotal couplings may include bolts or other suitable fasteners. *Id.* (citing Ex. 1003, 8:49–55). Thus, L&P asserts that Lawson ’228, as modified by Lawson ’498 to include a pivotal connection between its bracket 325 and block 340, would result in a first rotor shaft that is a bolt. *Id.*

The evidence supports L&P’s assertions as to the first rotor shaft. As discussed above, Lawson ’498 discloses that motor activator block 340 is rotationally coupled to front motor bracket 325, which is attached to activator shaft 350. Ex. 1003, 10:41–45; Ex. 1005 ¶ 51. Lawson ’498 further describes that pivotal couplings can be achieved using bolts. Ex. 1003, 8:49–55; Ex. 1005 ¶ 52. We find that the pivot point illustrated in Figure 5 of Lawson ’498 depicts a point at which front motor bracket 325 pivotably couples with motor activator block 340 and that such a pivot point

can be achieved using a bolt. Ex. 1005 ¶ 52. Thus, L&P has shown that Lawson '498 describes that the claimed “first rotor shaft” can be a bolt.

For the same reasons discussed above in the analysis of claim 1, we find that L&P has shown it would have been obvious to modify Lawson '228 to include this first rotor shaft, based on the teaching of Lawson '498.

Thus, based on our review of the evidence of record, we are persuaded the Petition demonstrates by a preponderance of the evidence that claim 3 of the '949 patent would have been unpatentable as obvious over the combined teachings of Lawson '228 and Lawson '498.

E. L&P's Additional Challenges

L&P also presents a first asserted ground of unpatentability of the claims as obvious over Lawson '228 alone and a second asserted ground of unpatentability of the claims as obvious over Lawson '498 alone. Pet. 16–41. Because the challenge based on Lawson '228 in combination with Lawson '498, discussed above, is dispositive of all the challenged claims, we need not reach L&P's other challenges as to these same claims. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359 (2018) (holding a petitioner “is entitled to a final written decision addressing all of the claims it has challenged”).

F. Remacro's Contingent Motion to Amend

We have concluded that challenged claims 1–3 of the '949 patent are unpatentable. We now turn to Remacro's revised contingent motion to enter proposed substitute claims 4–6. RMTA 2–18. For the reasons that follow, we deny Remacro's motion because Remacro's proposed substitute claims

do not meet the statutory requirements of 35 U.S.C. § 316(d) and the procedural requirements of 37 C.F.R. § 42.121.

1. Applicable Law

In an *inter partes* review, amended claims are not added to a patent as of right, but rather must be proposed as a part of a motion to amend. 35 U.S.C. § 316(d). The Board must assess the patentability of proposed substitute claims “without placing the burden of persuasion on the patent owner.” *Aqua Prods., Inc. v. Matal*, 872 F.3d 1290, 1328 (Fed. Cir. 2017) (en banc); *see also Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 3–4 (PTAB Feb. 25, 2019) (precedential). Subsequent to the issuance of *Aqua Products*, the Federal Circuit issued a decision in *Bosch Automotive Service Solutions, LLC v. Matal*, 878 F.3d 1027 (Fed. Cir. 2017) (“*Bosch*”), as well as a follow-up order amending that decision on rehearing. *See Bosch Auto. Serv. Sols., LLC v. Iancu*, No. 2015-1928 (Fed. Cir. Mar. 15, 2018) (Order on Petition for Panel Rehearing).

In accordance with *Aqua Products*, *Bosch*, and *Lectrosonics*, a patent owner does not bear the burden of persuasion to demonstrate the patentability of the substitute claims presented in the motion to amend. Rather, ordinarily, “the petitioner bears the burden of proving that the proposed amended claims are unpatentable by a preponderance of the evidence.” *Bosch*, 878 F.3d at 1040 (as amended on rehearing); *Lectrosonics*, Paper 15 at 3–4. In determining whether a petitioner has proven unpatentability of the substitute claims, the Board focuses on “arguments and theories raised by the petitioner in its petition or opposition to the motion to amend.” *Nike, Inc. v. Adidas AG*, No. 2019-1262, 2020 WL 1802796, at *5 (Fed. Cir. Apr. 9, 2020). The Board itself also may justify

any finding of unpatentability by reference to evidence of record in the proceeding. *Lectrosonics*, Paper 15 at 4 (citing *Aqua Products*, 872 F.3d at 1311 (O'Malley, J.)).

Notwithstanding the foregoing, a patent owner's proposed substitute claims must meet the statutory requirements of 35 U.S.C. § 316(d) and the procedural requirements of 37 C.F.R. § 42.121. *Lectrosonics*, Paper 15 at 4–8. Accordingly, a patent owner must demonstrate: (1) the amendment proposes a reasonable number of substitute claims; (2) the proposed claims are supported in the original disclosure (and any earlier filed disclosure for which the benefit of filing date is sought); (3) the amendment responds to a ground of unpatentability involved in the trial; and (4) the amendment does not seek to enlarge the scope of the claims of the patent or introduce new subject matter. *See* 35 U.S.C. § 316(d); 37 C.F.R. § 42.121.

2. *Proposed Substitute Claims*

Proposed substitute claims 4–6 are set forth below, with additions shown in underlining and deletions shown in bracketing.

Substitute claim 4. An electromechanical stretching apparatus of a convertible sofa, consisting of a mechanical stretching apparatus and an electric actuator, the mechanical stretching apparatus being provided with an electrically-driven connecting rod,

wherein[,] the electric actuator consists of a motor, a motor connecting tube, a motor movable slider, and a motor head fixing part, the motor adopted is a motor with a guide rail, the motor movable slider is installed on the guide rail of the motor, [the]a motor head of the motor is rotationally and removably connected through a second rotor shaft to the motor head fixing part fastened on the electrically-driven connecting rod, the motor connecting tube is rotationally and removably connected to the motor movable slider through a first rotor shaft and the motor connecting tube is fastened on the mechanical

stretching apparatus via at least two connections between the motor connecting tube and the mechanical stretching apparatus, and a bolt connection of the motor is achieved by using a rotational connection of the first rotor shaft and a bolt connection of the second rotor shaft.

Substitute claim 5. The electromechanical stretching apparatus of a convertible sofa as in claim [1]4, wherein said motor connecting tube extends to a flange at an end thereof, and the flange is fastened on a linkage part of the mechanical stretching apparatus via the at least two connections.

Substitute claim 6. The electromechanical stretching apparatus of a convertible sofa as in claim [1 or 2]4 or 5, wherein the first rotor shaft and the second rotor shaft are both a bolt.

Ex. 2013 (Claims Appendix for RMTA).

3. Analysis – Written Description

Remacro's motion fails to set forth adequate written description support for the proposed substitute claims. An amendment may not enlarge the scope of the claims of the patent or introduce new matter. 35 U.S.C. § 316(d)(3). In connection with its motion to amend, a patent owner must set forth "support in the original disclosure of the patent for each claim that is added or amended." 37 C.F.R. § 42.121(b)(1) (2018). "Importantly, to meet this requirement, citation should be made to the original disclosure of the application, as filed, rather than to the patent as issued." *Lectrosonics*, Paper 15 at 8.

The test for determining compliance with the written description requirement is whether the disclosure of the application as originally filed reasonably conveys to a person of ordinary skill in the art that the inventor had possession of the claimed subject matter at the time of filing, rather than the presence or absence of literal support in the specification for the claim language. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed.

Cir. 2010) (en banc); *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563 (Fed. Cir. 1991); *In re Kaslow*, 707 F.2d 1366, 1375 (Fed. Cir. 1983).

For the reasons that follow, Remacro has not set forth adequate written description support for the proposed substitute claims in the original disclosure of the patent, namely U.S. Patent Application No. 14/781,567 (“the ’567 application”). Remacro asserts that “substitute claim 4 is fully supported by the originally filed ’567 application.” RMTA 6. Specifically, Remacro asserts that support for the newly added limitation of “a bolt connection of the motor is achieved by using a rotational connection of the first rotor shaft and a bolt connection of the second rotor shaft” is found in paragraph 22 and Figure 4 of the ’567 application. *Id.* at 8 (citing Ex. 2006, ¶ 22, Fig. 4).

Figure 4 of the ’567 application is reproduced below:

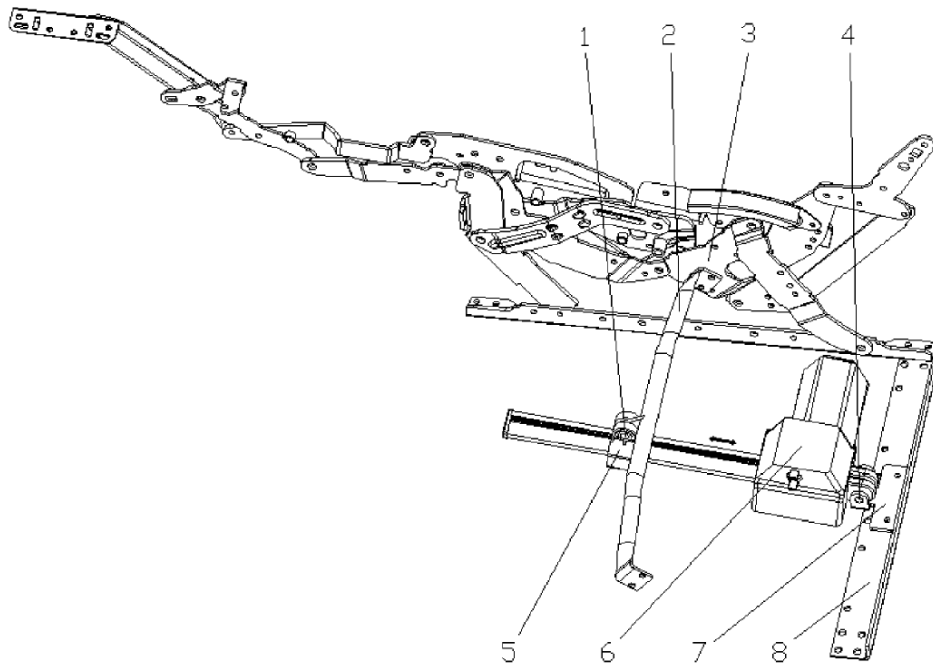


FIG. 4

Ex. 2006, 12. Figure 4 is a schematic diagram of main components and an operational mode of an embodiment of the invention, including first rotor shaft 1, motor connecting tube 2, linkage part 3, second rotor shaft 4, motor movable slider 5, motor 6, motor head fixing part 7, and electrically-driven connecting rod 8. *Id.* ¶ 16. Paragraph 22 of the '567 application is reproduced below:

In this embodiment, a manner of rotational connection of the first rotor shaft 1 and the second rotor shaft 4 is achieved by means of bolt connection, thereby achieving bolt connection of the motor 6; and the motor connecting tube 2 is fastened on the linkage part 3 of the mechanical stretching apparatus by using a bolt, which facilitates installation, removal and maintenance of the motor 6.

Id. ¶ 22.

L&P argues that Remacro's motion to amend should be denied because the added "bolt connection" limitation in substitute claim 4 lacks written description support in the '567 application and improperly introduces new matter in contravention of 35 U.S.C. § 316(d)(3). RMTA Opp. 3. Specifically, L&P argues that Figure 4 of the '567 application does not show a bolt connection of the motor using first rotor shaft 1. *Id.* at 4–5. Instead, according to L&P, Figure 4 shows bolt connection of motor connecting tube 2 and motor movable slider 5 using first rotor shaft 1. *Id.* at 5. L&P argues that the '567 application "never describes that the first rotor shaft is connected to the motor." RMTA Sur-Reply 5.

Remacro asserts that paragraph 22 of the '567 application provides "explicit support" for the bolt connection limitation. RMTA Reply 4 (emphasis omitted). Remacro further argues that "in view of [Figure 4] and related description in the specification, a POSITA would understand that a

bolt connection using a bolt for the first rotor shaft and a bolt for the second rotor shaft is disclosed and supported by the specification as shown in annotated Fig. 4 of the '567 [a]pplication (reproduced below).” *Id.* at 4–5.

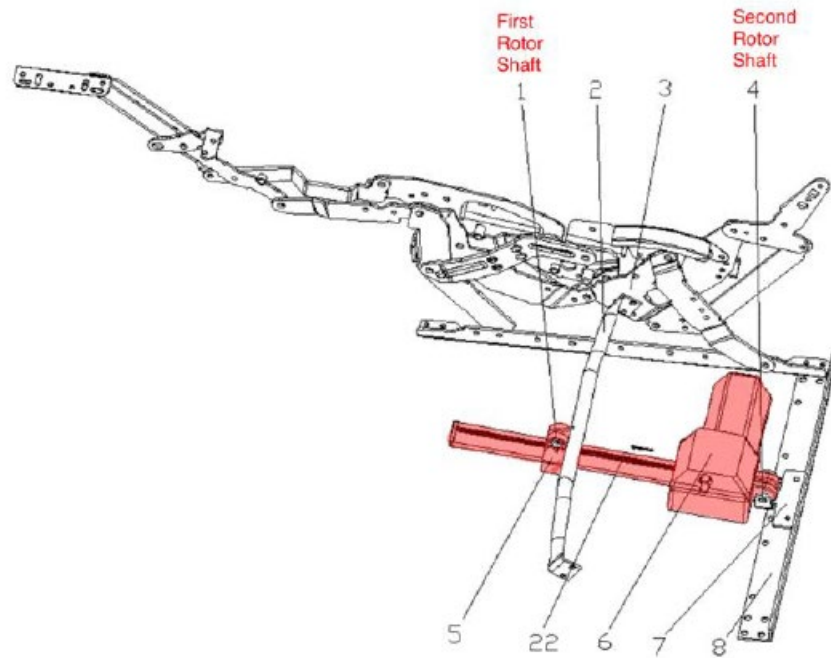


FIG. 4

Figure 4 above shows a schematic of the operational components as annotated by Remacro to identify first rotor shaft 1 and second rotor shaft 4.

Id. at 5. Remacro argues that

removal of a bolt acting as the first rotor shaft 1 and a bolt acting as the second rotor shaft 4 “facilitates installation, removal and maintenance of the motor 6” by enabling the motor 6 and the guide rail coupling the motor movable slider 5 to be separated as a unit (shown and highlighted in annotated Fig. 4) from the frame and stretching apparatus.

Id. (citing Ex. 2006 ¶¶ 21–22).

We agree with L&P that the '567 application does not provide adequate written description support for the bolt connection limitation as proposed in substitute claim 4. The language of the bolt connection

limitation recites that “a bolt connection *of the motor* is achieved by using a rotational connection of the first rotor shaft and a bolt connection of the second rotor shaft.” Ex. 2013, 1 (other emphases omitted). The ’567 application describes that motor movable slider 5, not motor 6, is rotationally connected to connecting tube 2 through first rotor shaft 1. Ex. 2006 ¶ 19. Motor movable slider 5 is not part of motor 6.

Rather, the ’567 application describes that “an electric actuator consists of a motor 6, a motor connecting tube 2, a motor movable slider 5 and a motor head fixing part 7.” *Id.* The ’567 application describes that “the motor adopted is a motor with a guide rail, a motor head is rotationally connected through a second rotor shaft 4 to the motor head fixing part 7.” *Id.* Thus, the ’567 application describes that motor 6 includes a guide rail and a motor head, but describes motor movable slider 5 as being separate from motor 6.

This description of the slider 5 being separate from motor 6 contradicts Remacro’s annotated Figure 4, reproduced above, in which Remacro included motor movable slider 5 as part of the motor, shown in red, along with the motor head and the guide rail, as evidence of a bolt connection *of the motor* by a rotational connection of the first rotor shaft. Remacro’s counsel explained, in reference to this annotated Figure 4, that “the whole motor . . . includes the motor head, the guiderail and also the slider” such that everything colored in red in the annotated Figure 4 is the motor. Tr. 18:6–11. This explanation is not consistent with the description in the ’567 application.

Turning to paragraph 22 of the ’567 application, we understand this description, in accordance with the ordinary meaning of the terms used

therein, to describe that the bolt connection of motor 6 is achieved by using a bolt for first rotor shaft 1 and a bolt for second rotor shaft 4. Ex. 2006 ¶ 22. Substitute claim 4 is broader than the disclosure in paragraph 22 of the '567 application.

As acknowledged by Remacro's counsel, substitute claim 4 is not limited to a bolt for the first rotor shaft. Rather, substitute claim 4 requires only "a rotational connection of the first rotor shaft." Ex. 2013, 1. The proposed substitute claims further narrow this "rotational connection" to be a bolt in substitute dependent claim 6. Ex. 2013, 2; Tr. 21:10–21. Thus, substitute claim 4 covers a first rotor shaft that is not necessarily a bolt. For instance, Remacro's counsel explains that the "rotational connection" of substitute claim 4 encompasses a pin. *Id.* at 21:6–7, 22:4–8.

In its Motion to Amend, Remacro proposed an initial substitute claim 6 that recited "the first rotor shaft and the second rotor shaft both comprise a pin that facilitates installation, removal, and maintenance of the motor." Paper 19, 9. In our Preliminary Guidance, we explained that this pin limitation is new matter. Paper 23, 5–6. Specifically, we found that paragraph 22 of the '567 application describes each shaft as a bolt connection, and paragraph 22 of Chinese Patent Application 201310719702.0 ("the '702 application," Ex. 2008), i.e., Remacro's Chinese priority application, describes each shaft as a latch connection, and "neither application describes first and second rotor shafts as a 'pin.'" *Id.* at 6. The revised substitute claim 4, in which the "rotational connection of the first rotor shaft" encompasses a pin, suffers from the same new matter issue as raised in our Preliminary Guidance.

Remacro's counsel argues that "bolt connection" as described in the '567 application should be broadly construed to encompass various bolt shapes, including pins, but Remacro's counsel offers insufficient evidence to support such an interpretation. Tr. 21:2–5. During the hearing, Remacro's counsel pointed to Dr. Cameron's testimony. *Id.* (presumably referring to Ex. 2010 ¶ 72). In paragraph 72, Dr. Cameron testified that use of a pin "is supported by Figure 4 and paragraphs 19, 21, and 22 of [the '567 application and its international priority application]." Ex. 2010 ¶ 72. Dr. Cameron does not provide any explanation or basis for this assertion that "pin" is supported by either application. Thus, it is entitled to little weight.

In fact, this same testimony by Dr. Cameron was provided in support of Remacro's original motion to amend, and we considered it in rendering our Preliminary Guidance. Paper 23, 6 (noting the deficiency in the testimony provided by Dr. Cameron in paragraph 72). Remacro did not submit additional evidentiary support in response to this Preliminary Guidance to support its Revised Motion to Amend. *See* Paper 15, 13–14 (Board providing guidance to the parties that a revised motion to amend can include evidence).

Remacro also points to the fact that the '702 application and the '567 application use different Chinese words for the word "bolt." Tr. 21:2–9, 22:4–8. As noted above and in our Preliminary Guidance, neither the '702 application's use of "latch" nor the '567 application's use of "bolt" to describe the first rotor shaft provide adequate support for the use of a "pin."

4. Conclusion

For these reasons, we find that Remacro's Revised Contingent Motion to Amend does not establish adequate support in the original disclosure of

the patent for proposed substitute claim 4. Likewise, proposed substitute dependent claims 5 and 6 suffer from one or both of the above-noted deficiencies for the same reasons. Thus, we deny Remacro's Revised Contingent Motion to Amend.¹³

III.CONCLUSION

In summary:

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
1-3	103	Lawson '228, Lawson '498	1-3	
1-3	103	Lawson '228 ¹⁴		
1-3	103	Lawson '498 ¹⁵		
Overall Outcome			1-3	

Motion to Amend Outcome	Claim(s)
Original Claims Cancelled by Amendment	
Substitute Claims Proposed in the Amendment	4-6
Substitute Claims: Motion to Amend Granted	
Substitute Claims: Motion to Amend Denied	4-6
Substitute Claims: Not Reached	

¹³ Should Remacro wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Remacro's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Remacro chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Remacro of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2) (2019).

¹⁴ As explained above, we do not reach this ground because the challenge based on the first ground is dispositive of all the challenged claims. See *SAS*, 138 S. Ct. at 1359.

¹⁵ See *supra* n.14.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–3 of the '949 patent have been proven to be *unpatentable*;

FURTHER ORDERED that Remacro's Revised Contingent Motion to Amend (Paper 24) is *denied*; and

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

IPR2019-00255
Patent 9,756,949 B2

For PETITIONER:

Scott B. Strohm
Elena K. McFarland
Christine Guastello
Bryan Meyer
SHOOK, HARDY & BACON L.L.P.
sstrohm@shb.com
emcfarland@shb.com
cguastello@shb.com
bemeyer@shb.com

For PATENT OWNER:

Hao Tan
Shen Wang
ARCH & LAKE LLP
haotan@archlakelaw.com
shenwang@archlakelaw.com

Bryan Nese
MAYER BROWN LLP
bnese@mayebrown.com