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Paper 36
Entered: July 25, 2022

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GLOBAL SHADE CORPORATION,
Petitioner,

v.

WITH-U E-COMMERCE (SHANGHAI) CO., LTD.,
Patent Owner.

IPR2021-00365
Patent 10,273,710 B2

Before BARRY L. GROSSMAN, GEORGE R. HOSKINS, and FRANCES L. IPPOLITO, *Administrative Patent Judges*.

GROSSMAN, *Administrative Patent Judge*.

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

Global Shade Ex. 1016
IPR Petition USP 10,669,738

I. INTRODUCTION

A. Background and Summary

Global Shade Corporation ("Petitioner") filed a Petition (Paper 1, "Pet.") requesting *inter partes* review of claims 7–9 and 11 of U.S. Patent No. 10,273,710 B2 (Ex. 1001, "the '710 patent"). With-U E-Commerce (Shanghai) Co., Ltd. ("Patent Owner") filed a Preliminary Response (Paper 7). With our authorization, Petitioner filed a Preliminary Reply to the Preliminary Response (Paper 8), and Patent Owner filed a Preliminary Sur-reply (Paper 9).

We concluded that Petitioner satisfied the burden, under 35 U.S.C. § 314(a), to show that there was a reasonable likelihood that Petitioner would prevail with respect to at least one of the challenged claims. Accordingly, on behalf of the Director (37 C.F.R. § 42.4(a)), and in accordance with *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1353 (2018), we instituted an *inter partes* review of all the challenged claims, on all the asserted grounds. Paper 10 ("Dec. Inst.").

Patent Owner filed a Response. Paper 14 ("PO Resp."). Petitioner filed a Reply. Paper 19 ("Reply"). Patent Owner filed a Sur-reply. Paper 23 ("Sur-reply").

Petitioner submitted twenty-three exhibits. *See* Exs. 1001–1105 (not consecutive; exhibit numbers 1019–1100 not used); *see also* Paper 32 (Petitioner's Updated Exhibit List). Petitioner relies, in part, on the Declaration testimony of Jeffrey L. Stein, Ph.D. *See* Exs. 1002, 1102.

Patent Owner submitted forty-six exhibits. *See* Exs. 2001–2046; *see also* Paper 33 (Patent Owner's Updated Exhibit List). Patent Owner relies,

in part, on the Declaration testimony of Thomas Bewley. *See* Exs. 2033, 2045.

Patent Owner submitted a contingent motion to amend claims 8, 9, and 11 with substitute claims 12, 13, and 14, respectively. Paper 15 ("Mot. Amend."). Petitioner opposed the motion. Paper 18 ("Mot. Amend. Opp."). Patent Owner filed a reply (Paper 24 ("Mot. Amend. Reply")); Petitioner filed a Sur-reply (Pape 29 ("Mot. Amend. Sur-reply")).

A hearing was held May 4, 2022. Paper 35 ("Tr.").

We have jurisdiction under 35 U.S.C. § 6. We enter this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

Petitioner has the burden of proving unpatentability of a claim by a preponderance of the evidence. 35 U.S.C. § 316(e).

Based on the findings and conclusions below, we determine that Petitioner has proven that claims 8, 9, and 11 are unpatentable. Petitioner has *not* proven that claim 7 is unpatentable.

We also deny the motion to amend.

B. Real Parties-in-Interest

Petitioner identifies itself as the real party-in-interest. Pet. 118. Patent Owner identifies itself as the real party-in-interest. Paper 3, 1.

C. Related Matters

The parties inform us that the '710 patent is the subject of litigation in *With-U E-Commerce (Shanghai) Co., Ltd. v. Global Shade Corp.*, No. 8:20-cv-00917-JVS-JDE (C.D. Cal.). Pet. 118; Paper 3, 1. This case has been stayed pending the outcome of this IPR proceeding. *See* Ex. 3001 ("All proceedings in this action are STAYED pending final resolution of Global Shade's December 22, 2020, petition for inter partes review (IPR) of the

asserted claims of the '710 patent (IPR2021-00365), including any appeals therefrom.").

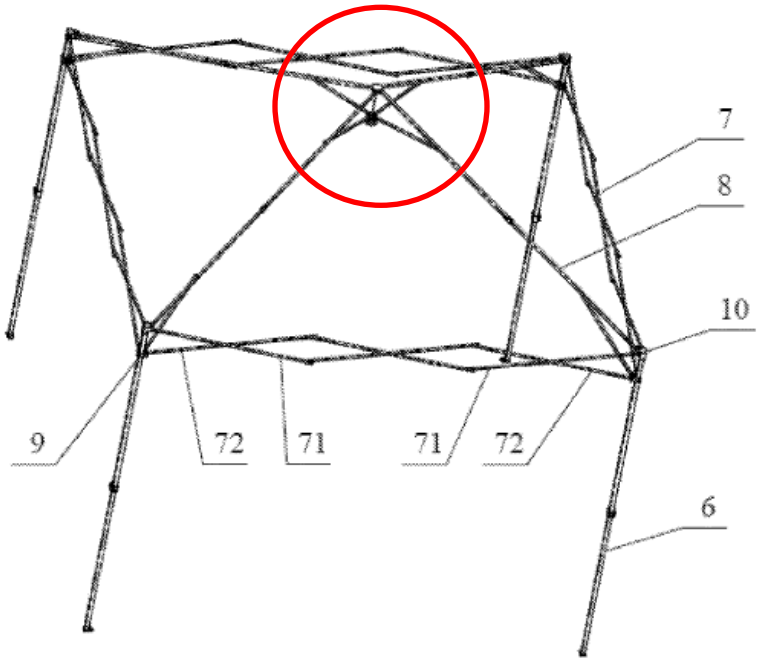
D. The '710 Patent

We make the following findings of fact concerning the '710 patent.

The '710 patent, titled "Central Lock and Canopy," issued on April 30, 2019, from a US national stage entry from PCT Application CN 2016/091675, filed on July 26, 2016. Ex. 1001, codes (22), (54), (45), (86), 1:6–7. The '710 patent claims foreign priority to Japanese Patent Application 2015-004155 U, filed on August 18, 2015. *Id.* at code (30), 1:7–8.

The '710 patent describes a canopy with a central lock that enables the canopy to be supported and uniformly stressed. *Id.* at 1:55–59.

Annotated Figure 16 of the '710 patent is reproduced below. Figure 16 shows an example of a canopy in an unfolded state. *Id.* at 3:1–2. The red circle, added to Figure 16, identifies the location of central lock 2, unnumbered in Figure 16.



As shown in Figure 16, the disclosed canopy includes four supporting legs 6, "outer retractable units" 7 connected between every two adjacent supporting legs 6, and "inner retractable units" 8 connected to each supporting leg 6. Ex. 1001, 4:47–51. Outer retractable units 7 and inner retractable units 8 form a roof frame of the canopy (coverable by fabric), and the roof frame and supporting legs 6 may form a canopy frame. *Id.* at 4:51–55. In the Figure 16 embodiment, there are four supporting legs 6. Accordingly, there are four outer retractable units 7 and four inner retractable units 8 respectively. *Id.* at 4:57–59.

Figure 1 from the '710 patent is an exploded view of the disclosed central lock that connects inner ends of inner retractable units 8. Figure 1, annotated to include a text box with reference numeral labels of the parts shown in Figure 1, is reproduced below.

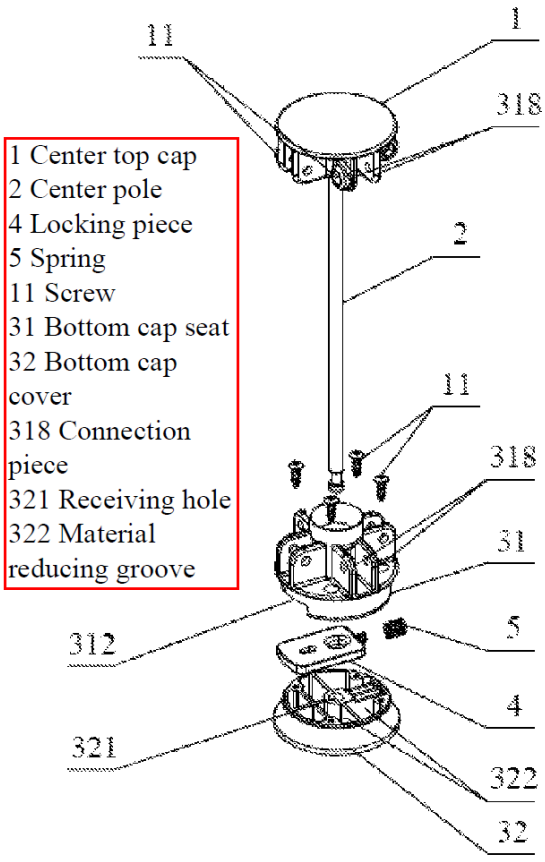


Figure 4 from the '710 patent is a sectional view of the central lock shown in Figure 2. Ex. 1001, 2:52. Figure 4, annotated to include a text box with reference numeral labels of locking piece 4 shown in Figure 4, is reproduced below.

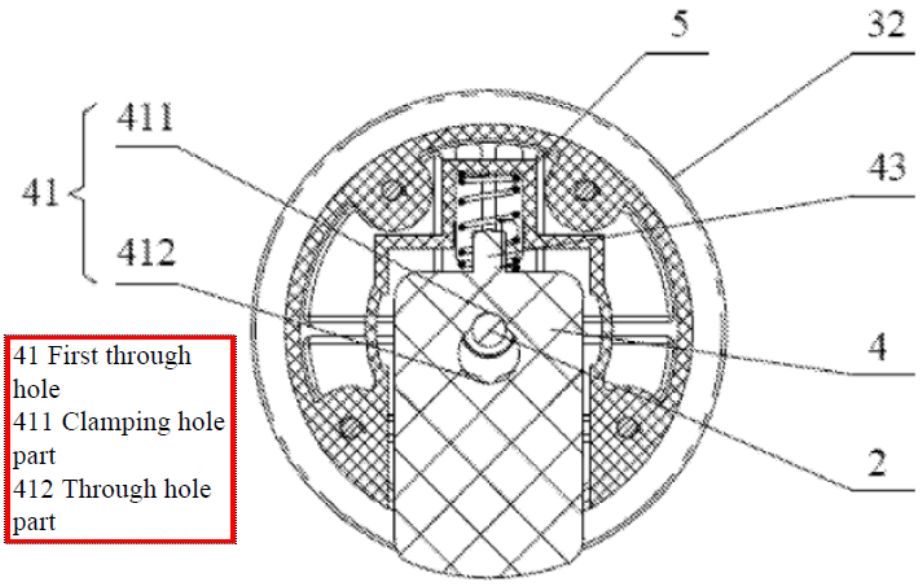


FIG. 4

As shown in Figure 4 and described in the written description, locking piece 4, in bottom cap 3, is "capable of moving back and forth along a radial direction of the center pole 2." Ex. 1001, 4:21–23. A "compressible elastic element" (*id.* at 7:30–37) or "[p]referably . . . a spring 5" facilitates radial movement of locking piece 4 (*id.* at 7:48–50).

A "first through hole 41," through which center pole 2 can pass is provided in locking piece 4. *Id.* at 4: 23–27. Center pole 2 is provided with a "clamping groove 21" and a "clamp locking part [22] located at the lower end of the clamping groove 21." *Id.*; *see also id.* at Fig. 6. As explained in the written description, "first through hole 41" has two components,

"clamping hole part 411" and "through hole part 412 arranged side by side." Ex. 1001, 7:58–60; *see also id.* at Fig. 13.

The locked position of the central lock is illustrated in Figure 6 of the '710 patent, reproduced below. Ex. 1001, 4:27–28. Figure 6 illustrates a schematic view of a connection between center pole 2 and center bottom cap 3, unnumbered in Figure 6. *Id.* at 2:54–55.

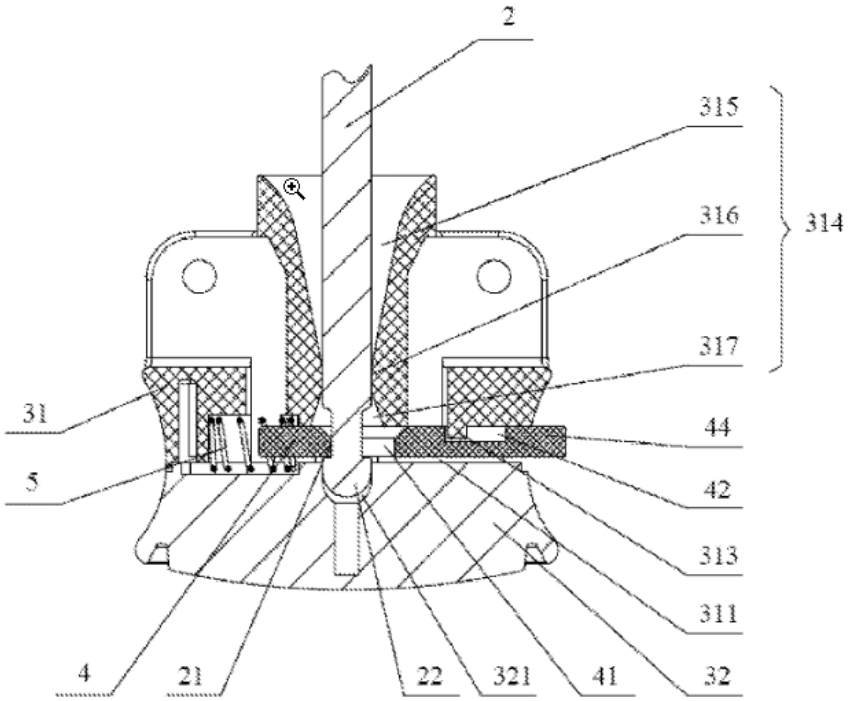


FIG. 6

When the central lock is in a locked state, as illustrated in Figure 6, part of an inner wall of first through hole 41 of locking piece 4 is clamped with clamping groove 21 of center pole 2. *Id.* at 4:27–30. In the locked position, an upper end surface of "clamp locking part 22" abuts against a lower end surface of "locking piece 4." *Id.* at 4:30–32. This prevents "clamp locking part 22" from moving through "first through hole 41," and

thus connects and locks together center pole 2 and center bottom cap 3. *Id.* at 4:32–35.

To put the central lock in its locking position, the user applies a force to move center bottom cap 3 upwards, so center pole 2 moves further into bottom cap 3 and clamp locking part 22 overcomes the pressure applied by spring 5 to locking piece 4 to move the locking piece inwards, "so that the clamping hole part 411 of the first through hole 41 is enabled to be clamped with the clamping groove 21 of the center pole 2." Ex. 1001, 9:32–64.

To unlock the central lock, the user presses "locking piece pressing part 44" inwards to overcome the elastic force of spring 5 and thus move the locking piece 4 inwards. *Id.* at 9:67–10. This allows the inner wall of "clamping hole part 411" to separate from "clamping groove 21" and allows center pole 2 to align with "through hole part 412" of "first through hole 41," and thereby allows center bottom cap 3 to move downwards. *Id.* at 9:67–10:4.

The canopy frame shown in Figure 16 is also foldable. *Id.* at 4:67–5:16, Fig. 19. Figure 19 of the '710 patent is reproduced below.

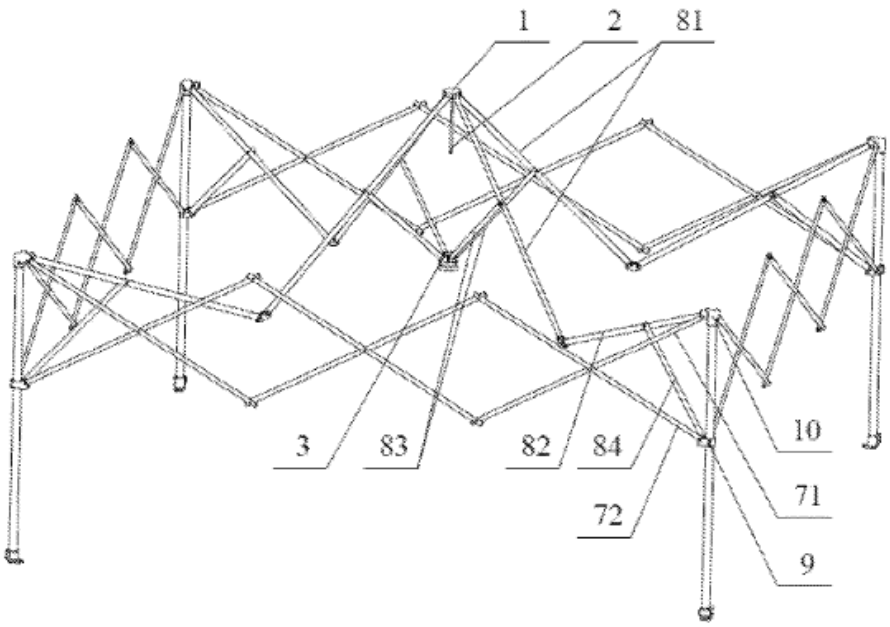


Figure 19 of the '710 patent depicts an example of a canopy being folded or unfolded. *Id.* at 3:8–9. When the canopy is unfolding from a folded state, four supporting legs 6 may be centered about the central lock and unfolded outwards, with outer retractable units 7 and inner retractable units 8 gradually stretching outwards. *Id.* at 4:67–5:4. After the canopy is unfolded, center bottom cap 3 is pushed upwards into its locked position. *Id.* at 5:17–19. The canopy may be unlocked, as described above, to enable inner retractable units 8 to be folded towards the central lock. *Id.* at 5:40–49.

A second embodiment of the disclosed central lock is shown in Figures 22–26. Figure 22, an exploded view of the second embodiment,

similar to the exploded view of the first embodiment in Figure 1, is reproduced below.

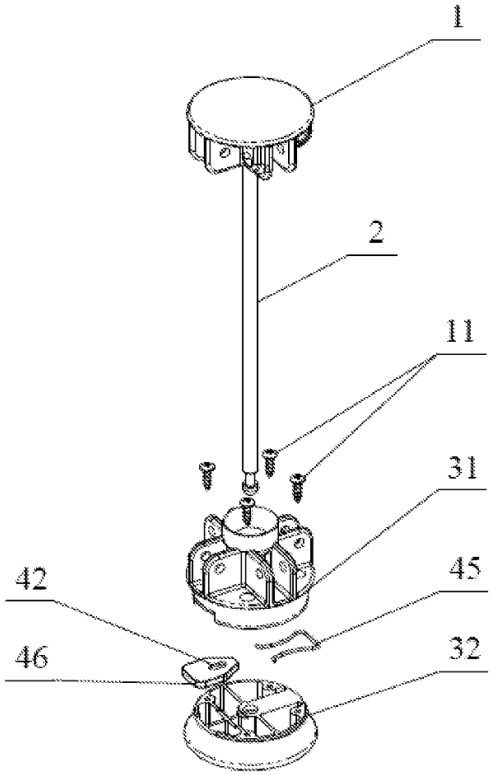


FIG. 22

In the second embodiment, locking piece 4 comprises elastic wire 45 and unlocking push piece 46. *Id.* at 8:18–20.

As shown in Figure 24, reproduced below, elastic wire 45 is U-shaped and comprises an elastic wire "body part 451" and "two elastic deforming parts 452." Ex. 1001, 8:21–23. Elastic deforming parts 452 are curved inwardly, toward each other (the written description describes them as "X-shaped"), with "narrow opening 453" forming the "first through hole" in the area of the reduced opening between elastic deforming parts 452. *Id.* at 8:23–27.

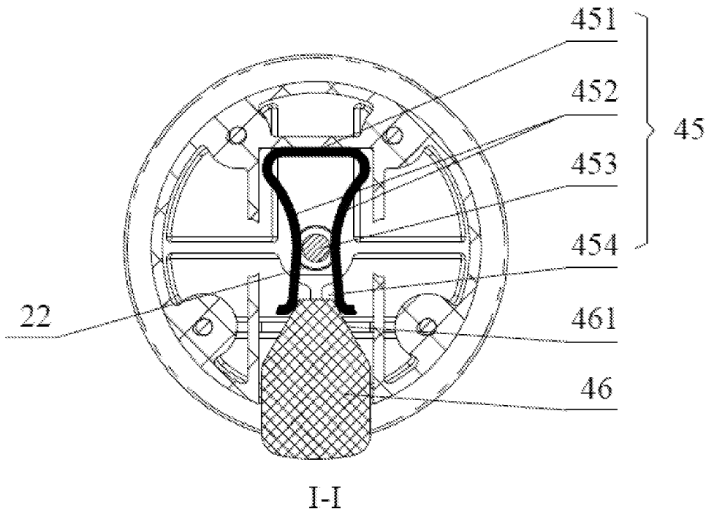


FIG. 24

In this second embodiment, to *lock* the structure, as shown in Figure 24, center pole 2 is inserted into bottom cap 3, which causes "clamp locking part 22" to widen "narrow opening 453" until "clamping groove 21" in center pole 2 is aligned with the inner wall of opening 453. *Id.* at 8:33–37. In this aligned position, opening 453 is narrowed under the effect of the "elastic restoring force" of elastic wire 45. *Id.* at 8:38–39. This "elastic restoring force" enables the inner wall of opening 453 "to be clamped in" clamping groove 21 of center pole 2. *Id.* at 8:39–41.

In this second embodiment, to *unlock* the structure, as shown in Figures 25 and 26, the user presses inwardly "unlocking push piece" 46, which widens socket 454 of elastic wire 45 until opening 453 is enlarged sufficiently so that clamp locking part 22 is capable of passing through opening 453. Ex. 1001, 8:44–49. This allows separation between top cap 1 and bottom cap 3, and thereby allows the canopy to be folded. *Id.* at 8:50–53.

E. Illustrative Claims

Petitioner challenges claims 7–9 and 11. Claims 7 and 8 are independent and are reproduced below (with subparagraph notations inserted as in the Petition):

> 7. [pre] A central lock, comprising
>
> [A] a center pole (**2**),
>
> [B] a center top cap (1) fixedly arranged at one end of the center pole (2) and
>
> [C] a center bottom cap (3) detachably connected to the other end of the center pole (**2**), wherein,
>
> [D] a locking piece (**4**) capable of moving back and forth along a radial direction of the center pole (**2**) is received in the center bottom cap (**3**),
>
> [E] a first through hole (**41**) through which the center pole (**2**) can pass through is provided in the locking piece (**4**), and
>
> [F][1] a portion of the other end of the center pole (**2**) is provided with a clamping groove (**21**) and
>
> [F][2] a clamp locking part (**22**) located at the lower end of the clamping groove (**21**);
>
> [G] when the central lock is in a locked state, part of an inner wall of the first through hole (**41**) of the locking piece (**4**) is clamped with the clamping groove (**21**) of the center pole (**2**), and an upper end surface of the clamp locking part (**22**) abuts against a lower end surface of the locking piece (**4**); and
>
> [H] when the central lock is in an unlocked state, the inner wall of the first through hole (**41**) of the locking piece (**4**) is separated from the clamping groove (**21**) and the clamp locking part (**22**) can pass through the first through hole (**41**),
>
> [I] and wherein the first through hole (**41**) comprises a clamping hole part (**411**) and a through hole part (**412**) arranged side by side, the clamping hole part (**411**) has a diameter not smaller than that of the clamping groove (**21**), the through hole part (**412**) has a diameter greater than that of the clamp locking part (22).

Ex. 1001, 12:62–13:20.[1]

8. [pre] A collapsible canopy with a center lock, said collapsible canopy comprising:

[A] at least three supporting legs,

[B] a plurality of outer retractable units connected between every two adjacent supporting legs, and

[C] a plurality of inner retractable units connected to each supporting leg, wherein said outer retractable units and said inner retractable units form a roof frame for said collapsible canopy, and

[D] a center lock, wherein said plurality of inner retractable units are connected through said center lock, said center lock comprising:

[D][i] a center top cap,

[D][ii] a center pole, comprising:

[D][ii][1] a center pole top end rigidly connected to said center top cap,

[D][ii][2] a center pole bottom end,

[D][ii][3] a clamping groove, and

[D][ii][4] a clamp locking part located at the lower end of said clamping groove, and

[D][iii] a center bottom cap detachably connected to said center pole bottom end, said center bottom cap comprising:

[D][iii][1] a spring loaded locking piece for engaging said clamping groove, and

[D][iii][2] a clamp locking part receiving section for receiving said clamp locking part,

[E] wherein when said center lock is in a locked state said spring loaded locking piece is engaged with said clamping groove and said clamp locking part is inserted into said clamp

[1] Bold font reference numerals are included in claim 7 of the ’710 patent. Reference numerals are not included in claim 8 of the patent.

> locking part receiving section, wherein when said center lock is in an unlocked state said center pole is detached from said center bottom cap.

Id. at 13:21–14:19.

F. Asserted Grounds

Petitioner contends that the challenged claims would have been unpatentable based on the following grounds:

Claim(s) Challenged	35 U.S.C. §[2]	References/Basis
8, 9,11	103	Rousselle,[3] Tsai[4]
8, 9, 11	103	Chang,[5] Tsai
8, 9, 11	103	Tsai, Rousselle or Tsai, Chang
7	102(a)(1)	Ohnishi[6]
7	103	Ohnishi

Pet. 7–8. In support of its proposed grounds, Petitioner relies on the Declaration testimony of Jeffrey L. Stein, Ph.D. *See* Exs. 1002, 1102.

Patent Owner relies on the Declaration testimony of Thomas Bewley, Ph.D. *See* Exs. 2023, 2045.

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[2] The relevant sections of the Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112–29, took effect on March 16, 2013. The application that issued as the '710 patent was filed after March 16, 2013. *See* Ex. 1001, codes (22), (30). Thus, we apply the AIA version of these statutes. *See* 35 U.S.C. § 100(i).

[3] US 6,345,639 B2, issued Feb. 12, 2002 (Ex. 1005). Petitioner contends that Rousselle is a printed publication qualifying as prior art to the '710 patent under § 102(a)(1). Pet. 8.

[4] GB 2321913 A, published Aug. 12, 1998 (Ex. 1007). Petitioner contends that Tsai qualifies as prior art to the '710 patent under § 102(a)(1). Pet. 8.

[5] WO 00/23676, published Apr. 27, 2000 (Ex. 1006). Petitioner contends that Chang qualifies as prior art to the '710 patent under § 102(a)(1). Pet. 8.

[6] US 8,066,300 B2, issued Nov. 29, 2011 (Ex. 1008). Petitioner contends that Ohnishi qualifies as prior art to the '710 patent under § 102(a)(1). Pet. 8.

II. UNPATENTABILITY ANALYSIS

A. Legal Standards

1. Anticipation

"The hallmark of anticipation is prior invention." *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). As explained in *Net MoneyIN,*

> unless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102.

Id. at 1371; *see also Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987) ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."). "The identical invention must be shown in as complete detail as is contained in the . . . claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989).

2. Obviousness

Section 103(a) forbids issuance of a patent when "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when available, evidence such as commercial success, long felt but unsolved needs, and failure of

others. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *see KSR*, 550 U.S. at 407 ("While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls."). The Court in *Graham* explained that these factual inquiries promote "uniformity and definiteness," for "[w]hat is obvious is not a question upon which there is likely to be uniformity of thought in every given factual context." 383 U.S. at 18.

The Supreme Court made clear that we apply "an expansive and flexible approach" to the question of obviousness. *KSR*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417.

In determining whether there would have been a motivation to combine prior art elements to arrive at the claimed invention, it is insufficient to simply conclude the combination would have been obvious without identifying any reason *why* a person of ordinary skill in the art would have made the combination. *Metalcraft of Mayville, Inc. v. The Toro Co.*, 848 F.3d 1358, 1366 (Fed. Cir. 2017).

Moreover, in determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 164 (Fed. Cir. 1985) ("It is elementary that the claimed invention must be considered as a whole in deciding the question of obviousness."); *see also Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530,

1537 (Fed. Cir. 1983) ("[T]he question under 35 U.S.C. § 103 is not whether the differences *themselves* would have been obvious. Consideration of differences, like each of the findings set forth in *Graham*, is but an aid in reaching the ultimate determination of whether the claimed invention *as a whole* would have been obvious.").

As a factfinder, we also must be aware "of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning." *KSR*, 550 U.S. at 421.

Applying these general principles, we consider the evidence and arguments of the parties.

B. Level of Ordinary Skill in the Art

The level of skill in the art is "a prism or lens" through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). "This reference point prevents . . . factfinders from using their own insight or, worse yet, hindsight, to gauge obviousness." *Id.*

Factors pertinent to a determination of the level of ordinary skill in the art include: (1) educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of workers active in the field. *Env't Designs, Ltd. v. Union Oil Co*., 713 F.2d 693, 696–97 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case. *Id.* Moreover, these factors are not exhaustive but are merely a guide to

determining the level of ordinary skill in the art. *Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007).

In determining a level of ordinary skill, we also may look to the prior art, which may reflect an appropriate skill level. *Okajima*, 261 F.3d at 1355.

Additionally, the Supreme Court informs us that "[a] person of ordinary skill is also a person of ordinary creativity, not an automaton." *KSR*, 550 U.S. at 421.

"The *Graham* analysis includes a factual determination of the level of ordinary skill in the art. Without that information, a district court cannot properly assess obviousness because the critical question is whether a claimed invention would have been obvious at the time it was made to one with ordinary skill in the art." *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986).

Neither party provides any persuasive evidence or argument concerning the factors identified above or any other factors relevant to determining the level of ordinary skill.

Petitioner contends that a person having ordinary skill in the art "would have had a *degree* in the mechanical arts, or a related discipline, and at least two years of experience in the design and/or analysis of mechanical devices, fabricated frames, and/or kinematic linkages." Pet. 7 (emphasis added) (citing Ex. 1002 ¶¶ 26–29). Petitioner also contends that "[a]dditional work experience could serve as a substitute for a formal degree and vice versa." *Id*.

Dr. Stein testifies that "[t]he engineers and engineering Bachelor's, Master's, and Ph.D. students that I worked with during the 2000s and 2010s had the requisite knowledge to make and use systems as described in the

claims of the '710 patent." Ex. 1002 ¶ 28. Dr. Stein does not provide the underlying facts or data on which his opinion testimony is based. Accordingly, it is entitled to little or no weight.

At the hearing, when asked to clarify what kind of "degree" was intended, counsel for Petitioner responded

> I don't know that it matters to the outcome. I think that there is some flexibility. And this is not the highest tech sort of invention, technology, and so I think an associate's degree, a bachelor's degree, you know, anything in there would be sufficient to understand what's going on here.

Tr. 11:13–19.

Patent Owner did not take a substantive position on the level of skill in its Response. *See* PO Resp. 25–26. Counsel for Patent Owner stated at the hearing that "I think you don't need a Ph.D." Tr. 44.

We determine that a person of ordinary skill would have had a Bachelor's degree in mechanical engineering and two years of relevant experience. A recipient of other academic degrees may qualify as a person of ordinary skill if they have taken coursework or have experience in a pertinent technology. Additional education could offset less work experience; additional work experience could offset less education or coursework. This definition is consistent with the prior art of record and the skill reflected in the Specification of the '710 patent.

C. Claim Construction

"In an *inter partes* review proceeding, a claim of a patent . . . shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b)." 37 C.F.R. § 42.100(b). Under this standard, we construe the claim "in accordance with the ordinary and customary meaning of such claim as understood by one of

ordinary skill in the art and the prosecution history pertaining to the patent." *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

Petitioner does not propose a specific construction for any claim term in this proceeding. Pet. 7. Rather, Petitioner asserts that "[n]o claim terms require construction to resolve the challenges in this Petition." *Id.* In this IPR proceeding, "Petitioner: (a) assumes the claims are not invalid under §112; and (b) interprets the claims consistent with PO's Infringement Contentions." *Id.*

Patent Owner argues that one phrase in claim 8 requires specific construction, which is the phrase "locking piece for engaging said clamping groove" in clause 8 (D) (iii)(1) and also appearing in clause 8 (E). PO Resp. 24–40. According to Patent Owner, this phrase should be construed in accordance with 35 U.S.C. § 112(f).[7] Limitations that invoke this statutory section "are generally known as 'means-plus-function' or 'step-plus-function' limitations." *Dyfan, LLC v. Target Corp.*, 28 F.4th 1360, 1365 (Fed. Cir. 2022).

[7] 35 U.S.C. § 112(f) states:

> (f) ELEMENT IN CLAIM FOR A COMBINATION. An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

1. "spring loaded locking piece for engaging said clamping groove" (claim 8, clause D(iii)(1))

"To determine whether § 112, para. 6[8] applies to a claim limitation, [Federal Circuit] precedent has long recognized the importance of the presence or absence of the word 'means.'" *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (Part II.C.1. of this opinion decided by the Court *en banc*). Under that precedent, "use of the word 'means' in a claim element creates a rebuttable presumption that § 112, para. 6 applies." *Id.* (citing *Personalized Media Commc'ns, LLC v. Int'l Trade Comm'n*, 161 F.3d 696, 703–04 (Fed. Cir. 1998)). Applying the converse, "failure to use the word 'means' also creates a rebuttable presumption—this time that § 112, para. 6 does not apply." *Id.* The Federal Circuit also noted, however, that in making the assessment of whether the limitation in question is a "means-plus-function" term subject to the strictures of § 112, para. 6, their cases have emphasized that "the essential inquiry is not merely the presence or absence of the word 'means' but whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure." *Id.*; *see also Dyfan*, 28 F.4th at 1365 (citing *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1583 (Fed. Cir. 1996)) ("What is important is . . . that the term, as the name for structure, has a reasonably well understood meaning in the art.").

The phrase in question in this IPR proceeding, "spring loaded locking piece for engaging said clamping groove" clearly does *not* use the word

[8] 35 U.S.C.§ 112, para. 6, applicable to any patent application filed before September 16, 2012, is the predecessor of the current statutory section, 35 U.S.C. § 112(f), which is applicable to the proceeding before us. The former § 112, para. 6, is identical to the current statutory section, § 112(f).

"means." As held in *Williamson*, however, this does not end our analysis. Generic terms such as "mechanism," "element," "device," and other nonce words that reflect nothing more than verbal constructs may be used in a claim in a manner that is tantamount to using the word "means" because they typically do not connote sufficiently definite structure and therefore may invoke § 112(f). *Williamson*, 792 F.3d at 1350.

Accordingly, because the phrase in question does not use the word "means," we begin our claim construction analysis with "a rebuttable presumption that the term conveys sufficiently definite structure and is not subject to § 112[(f)]." *MTD Prod. Inc. v. Iancu*, 933 F.3d 1336, 1341 (Fed. Cir. 2019); *see also Zeroclick, LLC v. Apple Inc.*, 891 F.3d 1003, 1007 (Fed. Cir. 2018) ("Neither of the limitations at issue uses the word 'means.' Presumptively, therefore, § 112, ¶ 6 does not apply to the limitations.").

A challenger can rebut the presumption by demonstrating that the "claim term fails to recite sufficiently definite structure or else recites function without reciting sufficient structure for performing that function. *Zeroclick*, 891 F.3d at 1007 (citations omitted).

"Intrinsic evidence, such as the claims themselves and the prosecution history, can be informative in determining whether the disputed claim language recites sufficiently definite structure or was intended to invoke § 112 ¶ 6." *Dyfan*, 28 F.th at 1365–66. "In addition, because this inquiry turns on the understanding of a person of ordinary skill in the art, we often look to extrinsic evidence when determining whether a disputed limitation would have connoted structure to a person of ordinary skill." *Id.* at 1366 (citing *Linear Tech. Corp. v. Impala Linear Corp*., 379 F.3d 1311, 1320 (Fed. Cir. 2004) (noting expert witness testimony and technical dictionaries

"help determine whether a claim term" would have had an "understood meaning in the art") (quoting *CCS Fitness, Inc. v. Brunswick Corp*., 288 F.3d 1359, 1369 (Fed. Cir. 2002)). "In cases where it is clear that a claim term itself connotes some structure to a person of ordinary skill in the art, 'the presumption that § 112, ¶ 6 does not apply is determinative' in the absence of 'more compelling evidence of the understanding of one of ordinary skill in the art.'" *Id.* (quoting *Apex Inc. v. Raritan Comput., Inc.*, 325 F.3d 1364, 1373 (Fed. Cir. 2003).

Thus, we turn to the arguments and the evidence relied on by the parties. We start with the claims.

a) The Claims

We make the following findings of fact concerning the claims.

As we have stated above, claim 8 *does not* use the word "means" in the phrase "spring loaded locking piece for engaging said clamping groove." Thus, there is a presumption that § 112(f) *does not* apply. *Williamson*, 792 F.3d at 1348.

Petitioner asserts that the phrases "spring loaded" and "locking piece" in claim 8 each are structural terms and are so understood by a person of ordinary skill in the relevant technology. *E.g.*, Reply 2 ("The term 'spring loaded locking piece' connotes structure to a POSITA. And even without the modifier 'spring loaded,' the term 'locking piece' by itself connotes structure to a POSITA.") (citing Ex. 1102 ¶¶ 7–12).

Petitioner relies on the declaration testimony of Jeffrey L. Stein, Ph.D. for evidentiary support. *See* Ex. 1102 ¶¶ 7–12.[9]

[9] Dr. Stein earned three degrees in mechanical engineering from the Massachusetts Institute of Technology, culminating in a Ph.D. Ex. 1002 ¶ 5.

Patent Owner contends that the limitation "spring loaded locking piece for engaging said clamping groove" should be construed under § 112(f), even though it does not include the term "means," because:

(1) the phrase "spring loaded" "is a state of being and, as such, does not say anything about the structure of an element that is in the 'spring loaded' state" (PO Resp. 27) (citing Ex. 2033 ¶ 30);

(2) the word "piece" is a "generic" word for performing the two distinct functions of "locking" and "engaging" (*id.*); and

(3) "performance of the recited 'locking' function is dependent on the recited 'engaging' function" (*id.*).

Patent Owner concludes that the construction of the phrase "spring loaded locking piece for engaging said clamping groove" in claim 8 is governed by § 112(f) and thus is limited to the two specific embodiments disclosed in the written description, or, in the words of the statute, "the corresponding structure, material, or acts described in the specification and equivalents thereof." *Id.* at 36–40.

Currently, he is a "full Professor" in the Department of Mechanical Engineering at the University of Michigan. *Id.* Dr. Stein has "studied, taught and/or researched in the design and control of mechanical systems for over 40 years." *Id.* As part of his consulting work, Dr. Stein also studied retractable canopies for use with automobiles (e.g., soft tops for convertibles). *Id.* ¶ 8. *See also, id.* ¶¶ 5–12; Ex. 1003 (CV) (each providing additional information on Dr. Stein's education, experience, and publications). We find that Dr. Stein is qualified as an expert by knowledge, skill, experience, training, or education to testify in this proceeding in the form of an opinion in accordance with Rule 702 of the Federal Rules of Evidence.

Patent Owner relies on the declaration testimony of Thomas Bewley, Ph.D. for evidentiary support. *See* Ex. 2033 ¶¶ 30–42.[10]

Before turning to the specific phrase in dispute, we note that the claim construction dispute between the parties addresses only language in independent claim 8. Patent Owner does *not* assert that similar language in challenged independent claim 7 is governed by § 112(f).

Claim 7 is directed to a "central lock" for clamping to a pole. Ex. 1001, 12:62–13:20. Claim 7 includes "a locking piece **(4)** capable of moving back and forth along a radial direction of the center pole **(2)**." *Id.* at 12:65–67. Patent Owner *does not* assert that this claimed "locking piece" in claim 7 is governed by § 112(f). Patent Owner does not provide any reasoning behind its apparent belief that the "locking piece" of claim 8 should be construed as a means-plus-function limitation, but the "locking piece" of claim 7 should not be so construed.

Claim 7 also includes "a clamping groove **(21)** and a clamp locking part **(22)** located at the lower end of the clamping groove **(21)**." Ex. 1001,

[10] Dr. Bewley earned Bachelor's and Master's degrees in mechanical engineering from the California Institute of Technology (Caltech), and a Ph.D. in mechanical engineering from Stanford University. Ex. 2033 ¶ 2. He currently serves as Director of the "Coordinated Robotics Lab in the Mechanical & Aerospace Engineering department at UC San Diego." *Id.* Dr. Bewley is a named inventor on a number of patents, including patents on robotic systems that use linkage mechanisms incorporating springs and friction-fit assemblies. *See also* Dr. Bewley's CV attached to Exhibit 2033, following page 93 (providing additional information on Dr. Bewley's education, experience, and publications). We find that Dr. Bewley is qualified as an expert by knowledge, skill, experience, training, or education to testify in this proceeding in the form of an opinion in accordance with Rule 702 of the Federal Rules of Evidence.

13:4–5. Patent Owner *does not* assert that this claimed "clamping groove" in claim 7 is governed by § 112(f).

Patent Owner asserts there are "two distinct functions" of the claimed "locking piece" in claim 8, which are "locking" and "engaging." PO Resp. 27.

Petitioner takes a different view. Petitioner asserts that claim 8 recites "a structural element (a 'locking piece') for performing a function ('engaging said clamping groove')." Reply 5 (citing Ex. 1102 ¶ 10).

We recognize that claim 8 adds the functional language "for engaging said clamping groove" to the term "locking piece." Thus, the claimed *structure* must be capable of performing these "engaging" and "clamping" functions.

The mere fact that the disputed limitations incorporate functional language, however, "does not automatically convert the words into means for performing such functions." *Zeroclick*, 891 F.3d at 1008 (citing *Greenberg*, 91 F.3d at 1583). In *Greenberg*, the Federal Circuit stated:

> [T]he fact that a particular mechanism—here "detent mechanism"—is defined in functional terms is not sufficient to convert a claim element containing that term into a "means for performing a specified function" within the meaning of section 112(6). Many devices take their names from the functions they perform. The examples are innumerable, such as "filter," "brake," "*clamp*," "screwdriver," or "*lock*."

Greenberg, 91 F.3d at 1583 (emphases added). *Greenberg* may have been prescient of the issues in the case before us in identifying specifically the words "clamp" and "lock" as among the "innumerable" words for structural devices that take their names from the functions they perform. The structural root words identified in *Greenberg*, "clamp" and "lock," are key

words in the phrase "spring loaded locking piece for engaging said clamping groove," which Patent Owner asserts is a means-plus-function clause.

Patent Owner argues that "'[s]pring-loaded locking piece for engaging the clamping groove' specifies two functions and does not have a discernible structure to perform the two specified functions," and that "'spring loaded' is a state of being and, as such, does not say anything about the structure of an element that is in the 'spring loaded' state." PO Resp. 27 (citing Ex. 2033 ¶ 30). We disagree.

As discussed above, the fact that a particular structure is defined in functional terms is not sufficient to convert a claim element containing that structure into a means for performing a specified function within the meaning of section 112(f). *Greenberg*, 91 F.3d at 1583. In *Greenberg*, the court stated:

> It is true that the term "detent" does not call to mind a single well-defined structure, but the same could be said of other *commonplace structural terms such as "clamp"* or "container." What is important is not simply that a "detent" or "detent mechanism" is defined in terms of what it does, but that the term, as the name for structure, has a reasonably well understood meaning in the art.

Id. (emphasis added). In *Greenberg*, the court also stated:

> In this case, . . . the element in question did not use conventional "means-plus-function" language, no other element of the claim was in means-plus-function form, and nothing cited to us from the prosecution history or elsewhere suggests that the patentee intended to claim in that fashion. There is therefore no reason to read the claim language in this case as reciting a means for performing a function, within the meaning of section 112(6).

Id. at 1584. This same statement can be made in the case before us.

This case is readily distinguishable from cases like *Baran v. Med. Device Techs., Inc*., 616 F.3d 1309 (Fed. Cir. 2010). In *Baran*, the Federal Circuit held that the claim language "release means for retaining the guide in the charged position" recites both a release function and a retention function. 616 F.3d at 1316–17. This claim phrase was written in classic means-plus-function format using the term "means for" performing the function of "retaining." There was no question as to whether this claim phrase was governed by § 112 ¶ 6. The only issue was the scope of the claimed function. The Federal Circuit agreed with the district court that the claim language recites both a release function and a retention function. *Id*. at 1317. The Federal Circuit stated that the term "release" was "not an idle description but a vital function to be performed by the means-plus-function element. . . . The claim language ties both functions to the same means-plus-function element, so it is appropriate that the element be construed accordingly." *Id*.

Here, the structural "locking piece" must be capable of locking, and also must be capable of engaging the clamping groove. As in *Greenberg*, these functional capabilities are not sufficient to convert a structural claim element into a means for performing a specified function within the meaning of § 112(f).

Patent Owner also argues that "[c]laim differentiation supports interpreting the limitation D(iii)(1) according to § 112(f)." PO Resp. 34. Patent Owner asserts "the '710 patent's disclosure demonstrates that the term 'spring loaded locking piece' is generic enough to cover two exemplary locking pieces that have incongruent structures." PO Resp. 34 (citing Ex. 2033 ¶ 38). Dr. Bewley merely repeats Patent Owner's argument.

According to Patent Owner, because dependent claims 9 and 10[11] each recite different, specific structure for the "spring loaded locking piece" in independent claim 8, the generic term "spring loaded locking piece" in claim 8 must be construed as a functional term. *Id.* at 36 ("Dr. Stein's interpretation of the claims 8 and 9 would make claim 10 sound like nonsense because, remember, Dr. Stein had previously, stated: "the locking piece (46) is different in the second embodiment."). Patent Owner cites no persuasive evidence or authority for this argument.

Moreover, "[i]t is not necessary that each claim read on every embodiment." *Baran*, 616 F.3d at 1316. Patent Owner does not cite any persuasive evidence that disclosing two structural embodiments covered by *dependent* claims converts a generic *independent* claim into a claim governed by § 112(f).

Based on the claims, there is no persuasive evidence or controlling legal authority to rebut the presumption that the phrase "spring loaded locking piece for engaging said clamping groove" in claim 8 is *not* governed by ¶ 112(f) because it does not use the word "means."

b) The Specification and Prosecution History

We make the following findings of fact concerning the Specification and prosecution history.

It is clear that the written description discloses two distinct embodiments of the claimed invention Ex. 1001, 7:23–27 ("In the present application, there are two embodiments for the locking piece 4. The first embodiment of the locking piece 4 is as illustrated in FIG. 1 to FIG. 15, and

[11] The patentability of claim 10 is *not* challenged in this proceeding.

the second embodiment of the locking piece 4 is as illustrated in FIG. 21 to FIG. 26.").

The written description makes clear that "in the first embodiment, the *locking piece 4 is an integral member, i.e., an integral structure*. Ex. 1001, 7:27–29 (emphasis added.)

The parties do not direct us to persuasive evidence in the Specification or the proceedings leading to the issuance of the '710 patent (the "prosecution history" in patent jargon) that informs our claim construction determination in this case.

Based on the Specification and prosecution history, there is no persuasive evidence or controlling legal authority to rebut the presumption that the phrase "spring loaded locking piece for engaging said clamping groove" in claim 8 is *not* governed by ¶ 112(f) because it does not use the word "means."

c) The Expert Declarations

Dr. Stein, on behalf of Petitioner, and Dr. Bewley, on behalf of Patent Owner, each offer declaration testimony on whether the phrase "spring loaded locking piece for engaging said clamping groove" in claim 8 is understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure.

Dr. Stein testifies that "claim 8 recites sufficient, and sufficiently definite, structure. In general, the term 'spring loaded locking piece,' and indeed the term 'locking piece,' are used by persons of ordinary skill to designate structure." Ex. 1102 ¶ 7. According to Dr. Stein,

> The term "spring loaded" provides a person of ordinary skill in the art with information about how the element (the "locking piece") is connected to other elements and interacts with them.

> Such information is structural information. For example, the term "spring loaded" in claim 8 tells a person of ordinary skill that the locking piece is connected to a spring and that the spring exerts a force on the locking piece.

Id. ¶ 8.

Dr. Stein also testifies that "a person of ordinary skill in the art would have understood 'locking piece' to be a structural element for performing the function of 'engaging the clamping groove.'" Ex. 1102 ¶ 10. He concludes that "a person of ordinary skill would have understood that 'locking' is not a separate function recited by the claim, but a part of the structural element 'locking piece.'" *Id.*

In Dr. Stein's opinion,

> [t]he '710 patent's disclosure of two different embodiments of a locking piece does not mean the term has no structural meaning to a person of ordinary skill. Instead, a person of ordinary skill would have recognized both embodiments as locking pieces, falling within the person of ordinary skill's structural understanding of that term.

Id. ¶ 10.

Dr. Bewley has a different opinion. According to Dr. Bewley,

> "Spring-loaded locking piece for engaging the clamping groove" specifies two functions and does not have a discernible structure to perform the two specified functions. First, "spring loaded" is a state of being and, as such, does not say anything about the structure of an element that is in the "spring loaded" state. Second, the term identifies a generic "piece" **for** the specified functions of both (A) "locking" . . . and (B) "engaging the clamping groove."

Ex. 2033 ¶ 30.

Dr. Bewley also testifies that the recited "locking" function is dependent on the recited "engaging" function. *Id.* In Dr. Bewley's opinion,

"[t]his dependency supports that a failure to recite sufficient structures to perform the 'engaging' function makes the limitation purely functional with respect to both recited functions." *Id.* He concludes that a person of ordinary skill "would understand that 'spring loaded locking piece for engaging the clamping groove' is an element of the invention that is purely functional." Ex. 2033 ¶ 30.

Dr. Bewley states, however, that "a very wide variety of *structures* can indeed be in a 'spring loaded' state while performing their function." *Id*. at ¶ 31 (emphasis added). Thus, Dr. Bewley recognizes that the term "spring loaded" is consistent with a broad group of generic *structures* that can be in a spring loaded state. Dr. Bewley also states that "[n]othing in claim 8 identifies any *non-generic structure* that performs the function of engaging the clamping groove." *Id*. at ¶ 36 (emphasis added). Dr. Bewley's testimony is that unless claim 8 identifies a "non-generic structure," "claim 8 does not recite any structure to perform the function of 'engaging the clamping groove.'" *Id.* This testimony is inconsistent with the controlling legal principles discussed above. Section 112(f) does not apply to claims because they merely recite a generic structure.

Dr. Bewley recognizes that dependent claim 9 recites that the "spring loaded locking piece comprises a spring," and that claim 10 recites that the "spring loaded locking piece comprises a U-shaped elastic wire." Ex. 2033 ¶ 37. He states his view that claims 9 and 10 do "not recite any details as to how the engagement is structurally accomplished." *Id*. He concludes that "claims 8–11 . . . can only all be reconciled by a determination that claim 8's element of 'spring loaded locking piece for engaging the clamping groove' is purely functional." *Id*. at pg. 41, heading "v." Again, this testimony is

inconsistent with the controlling legal principles discussed above. Section 112(f) does not apply to claims merely because they do not recite sufficient "details" of the claimed structure.

Neither expert provides the underlying facts or data on which their opinion is based. Neither expert cites standard, engineering, or technology-based dictionaries to support their testimony. Nor do they cite any evidence of common industry uses of the terms at issue. On balance, we give Dr. Stein's testimony slightly more probative weight than Dr. Bewley's testimony because Dr. Bewley relied on incorrect legal principles to reach his conclusions.

d) Conclusion on Claim Construction for the Phrase "spring loaded locking piece for engaging said clamping groove" in Claim 8

Based on the evidence and analysis above, we determine that § 112(f) does *not* apply to the claim 8 limitation "spring loaded locking piece for engaging said clamping groove" because the limitation recites words that would have been understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure, including the words "spring loaded" and "locking piece." Although this phrase uses some functional terms, this is not sufficient to convert a claim element containing that term into a 'means for performing a specified function' within the meaning of section 112(6). *Greenberg*, 91 F.3d at 1583 ("the fact that a particular mechanism—here 'detent mechanism'—is defined in functional terms is not sufficient to convert a claim element containing that term into a 'means for performing a specified function' within the meaning of section 112(6)").

D. Ground 1: Claim 8, 9 and 11 as Obvious over Rousselle and Tsai

Petitioner contends that claims 8, 9, and 11 would have been obvious over Rousselle and Tsai. Pet. 9–53.

1. Summary of Rousselle (Ex. 1005)

We make the following findings of fact concerning Rousselle.

Rousselle, titled "Collapsible Shelter/Tent with Frame Locking Mechanism," "relates to collapsible shelters and tents having sheet material walls supported by a collapsible frame." Ex. 1005, code (54), 1:14–18.

Figure 1A of Rousselle is reproduced below.

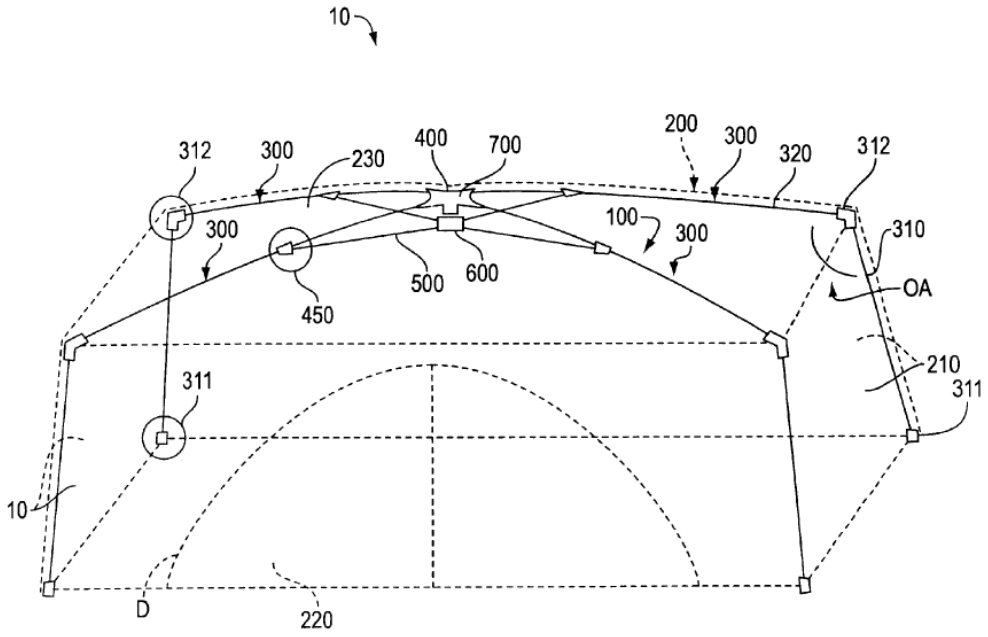


Figure 1A of Rousselle depicts an example of a collapsible shelter/tent in an erected state. *Id.* at 6:29–30. As shown in Figure 1A, shelter/tent 10 includes collapsible frame 100 that supports sheet-material cover 200. *Id.* at 6:30–32. Sheet material cover 200 includes sides 210 and ceiling 230, and collapsible frame 100 has four supporting legs 300 pivotally attached to upper clevis 400. *Id.* at 6:44–46, 6:54–56. Rousselle describes that "[a]lthough four legs are preferred, the frame can have only three legs or can

have five or more legs." *Id.* at 6:56–58. Each leg 300 includes leg tube 310 extending from tent foot 311 to hinge 312 and band bar 320 extending from hinge 312 to upper clevis 400. *Id.* at 6:58–61. Each leg 300 also includes hinge 450 that pivotally supports an outer end of center tube 500, while an inner end of center tube 500 is pivotally connected to lower clevis 600. *Id.* at 6:61–64. Upper and lower devices 400 and 600 may be locked together via novel locking mechanism 700. *Id.* at 6:66–67.

Figure 1D of Rousselle is reproduced below.

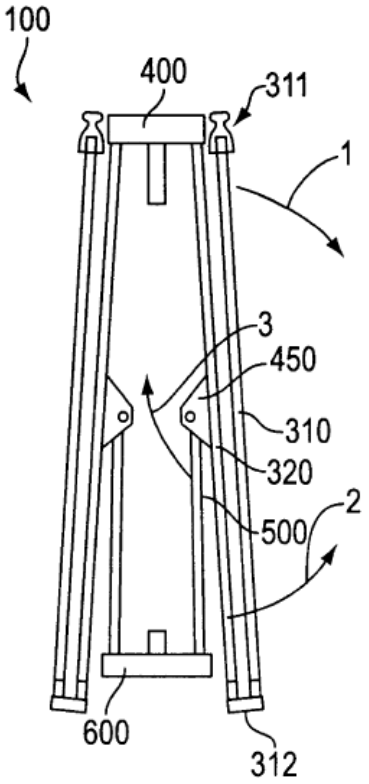


Figure 1D of Rousselle depicts an example of a shelter/tent in a collapsed state. *Id.* at 4:1–3. In order to erect a shelter/tent from such a collapsed state, a user may begin by moving leg tubes 310 downward in the direction of arrow 1 and raising band bars 320 upward in the direction of arrow 2. *Id.* at 13:5–9. Rousselle describes that this action causes center tubes 500 to elevate in the direction of arrow 3, and as center tubes 500 approach a

horizontal position, their outer ends push against cover 200, causing legs 300 to flex. *Id.* at 13:9–15. After center tubes 500 are lifted past approximately the horizontal axis, lower clevis 600 is forced upward towards the upper clevis 400. *Id.* at 13:26–29. The outward force of center tubes 500 also creates pressure further forcing leg tube 310 in the direction of arrow 1 and hinge 312 to its fully opened state, as shown in Figure 1(A). *Id.* at 13:16–21.

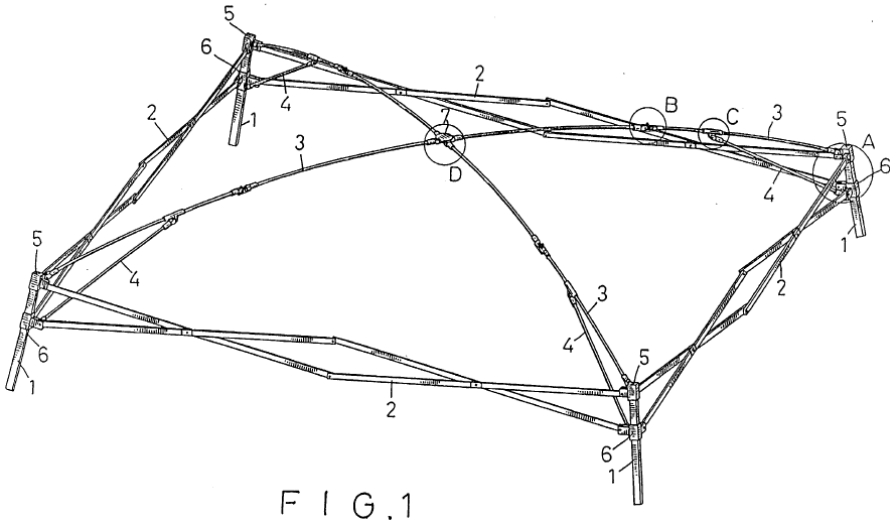
Rousselle also describes that once lower clevis 600 has been moved upward a certain distance, the user can place one hand under lower clevis 600 and the other above upper clevis 400 and push the clevises together such that locking mechanism 700 can lock the clevises together. *Id.* at 13:22–26.

2. Summary of Tsai (Ex. 1007)

We make the following findings of fact concerning Tsai.

Tsai, titled "Shelter frame with scissors-type linkage," "relates . . . to shelters including collapsible frames." Ex. 1007, code (54), 1:4–6. More specifically, Tsai describes "a shelter frame with a canopy support including . . . support rods" that "provides a greater support area than many prior canopy supports, which results in an aesthetically pleasing shelter canopy that is less likely to sag." *Id.* at 4:13–22; *see also id.* at 3:17–19.

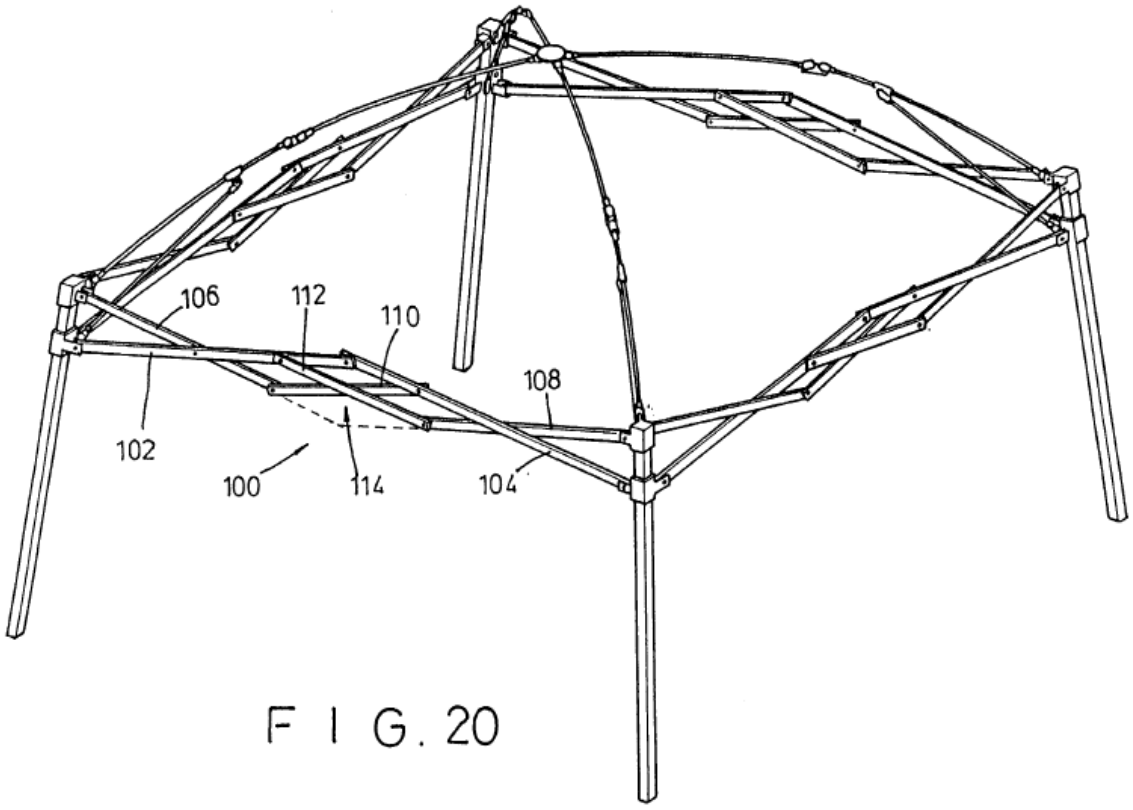
Figure 1 of Tsai is reproduced below.



F I G . 1

Figure 1 of Tsai depicts a collapsible shelter frame according to one embodiment. *Id.* at 5:16–17. As shown in Figure 1, the shelter frame includes a canopy support and a lower frame member that includes four upwardly extending poles 1 connected to one another by four pairs of scissors-type (or x-type) linkages 2. *See id.* at 7:4–10. Each scissors-type linkage 2 is pivotally secured to another linkage and to one of the poles 1. *Id.* at 7:10–12.

Figure 20 of Tsai is reproduced below.



F I G. 20

Figure 20 of Tsai depicts a shelter frame according to another embodiment. As shown in Figure 20, "[o]ne or all of the scissors-type linkage pairs shown in FIGURE[] 1 . . . may be replaced by a linkage assembly 100." *Id.* at 9:29–32. Linkage assembly 100 includes structural members 102 and 104 pivotally secured to one another and to respective sliding connectors 6. *Id.* at 9:32–35. Structural members 106 and 108 are secured to respective fixed connectors 5, and structural members 102–108 form two scissors-type linkages and operate in a scissor-like manner. *Id.* at 9:35–10:4. To eliminate the relatively low connection point associated with the structure shown in Figure 1 (shown in dashed lines in Figure 20), linkage assembly 100 also includes a linking device comprised of linking members 110 and 112. *Id.* at 10:4–8. "Linking member 110 extends from the free end of structural member 106 to structural member 104, and linking member 112

extends from the free end of structural member 108 to structural member 102." *Id.* at 10:8–12. According to Tsai, this results in a shelter frame with more headroom at point 114 midway between the poles—often the location of the entrance to the shelter. *Id.* at 10:12–15.

Tsai also describes that its shelter frame may be readily assembled, erected (or unfolded) for use and folded for storage and transport. Figure 21 of Tsai is illustrative and is reproduced below.

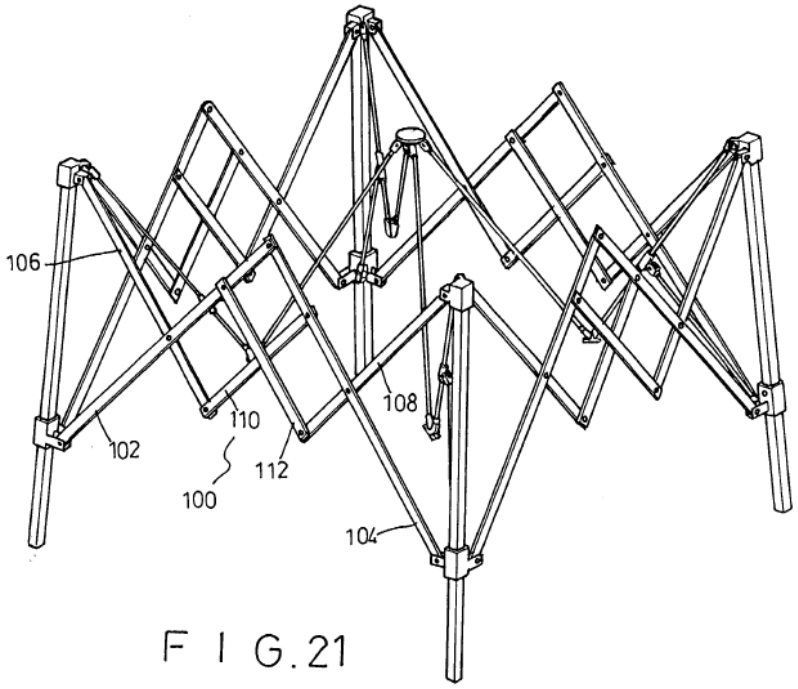


Figure 21 of Tsai depicts a view of the embodiment shown in Figure 20 in a partially folded orientation. *Id.* at 6:25–27.

3. Claim 8

Petitioner contends that the combination of Rousselle and Tsai renders obvious claim 8. Pet. 12–50. In the subsections below, we discuss Petitioner's arguments on each limitation.

In its Response,[12] Patent Owner does not dispute specifically Petitioner's arguments that the combination of Rousselle and Tsai teaches or suggests the limitations of claim 8, except for limitations D(iii)(1) and D(iii)(2), which Patent Owner asserts, as discussed *supra*, should be treated under § 112(f). *See* PO Resp. 62 (chart stating whether each limitation in claim 8 is disclosed in either Rousselle, Chang, or Tsai, reproduced below).

Clm.8	Rouss.	Chang	Tsai
Pre.	YES	YES	YES
A	YES	YES	YES
B	NO	NO	YES
C	YES	YES	YES
D	YES	YES	NO
Di	YES	YES	NO
Dii	YES	YES	NO
Dii1	YES	YES	NO
Dii2	YES	YES	NO
Dii3	YES	YES	NO
Dii4	YES	YES	NO
Diii	YES	YES	NO
Diii1	NO	NO	NO
Diii2	YES	YES	NO
[E]	NO	NO	NO

[12] Patent Owner addresses Grounds 1–3 collectively. *See* PO Response 57 (heading "ii" states "GROUNDS 1-3: the asserted obviousness of claims 8, 9 and 11 are not prima facie because neither petitioner nor its expert correctly resolved the differences between claim 7 and Ohnishi"). This heading is cited to illustrate the collective argument of Grounds 1–3. The substance of the heading is confusing because Patent Owner fails to explain why Grounds 4 and 5, concerning patentability of claim 7 based on Ohnishi, affect the merits of Grounds 1–3, concerning patentability of claims 8, 9, and 11 based on different references.

As is clear from an analysis of Patent Owner's chart, the only elements Patent Owner asserts are not disclosed in one or more of the cited references in Grounds 1–3 are the limitations in clauses "Diii1"[13] and "E."[14]

a) [8pre] A collapsible canopy with a center lock, said collapsible canopy comprising:

Petitioner asserts that Rousselle discloses the preamble of claim 8 because Rousselle discloses a collapsible canopy, e.g., "[a] collapsible shelter/tent," that "includes an improved locking mechanism that very securely maintains the structure in an erected position." Pet. 12 (citing Ex. 1005, Abstract; Ex. 1002 ¶ 63). Petitioner also asserts that Rousselle's locking mechanism is centrally located. *Id.* (citing, e.g., Ex. 1005, Figs. 1(A)–1(C); Ex. 1002 ¶ 63).

Patent Owner does not contest specifically Petitioner's arguments with respect to the preamble of claim 8. *See generally* PO Resp. 62 (chart).

Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Rousselle discloses or suggests the preamble of claim 8 ([8pre]).

b) [8A] at least three supporting legs

Petitioner asserts that Rousselle's canopy discloses limitation [8A] because it can include three or more legs. Pet. 13 (citing Ex. 1005, 2:50–53, 6:54–61, Figs. 1A–C). Petitioner also asserts that each of Rousselle's legs

[13] Clause [D][iii][1] states: "a spring loaded locking piece for engaging said clamping groove." *See, e.g.*, Pet. 44.
[14] Clause [E] states: "wherein when said center lock is in a locked state, said spring loaded locking piece is engaged with said clamping groove and said clamp locking part is inserted into said clamp locking part receiving section, wherein when said center lock is in an unlocked state said center pole is detached from said center bottom cap." *See, e.g.*, Pet. 48.

300 includes a "leg tube 310" that extends from the ground to hinge 312, and each leg tube 310 is a supporting leg. *Id.* (citing Ex. 1005, 6:57–61, Fig. 1A; Ex. 1002 ¶ 65).

Patent Owner does not contest specifically Petitioner's arguments with respect to this limitation. *See generally* PO Resp. 62 (chart).

Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Rousselle discloses or suggests limitation [8A].

c) [8B] a plurality of outer retractable units connected between every two adjacent supporting legs

Petitioner asserts that Tsai discloses limitation [8B] because Tsai's shelter frame includes supporting legs that are "connected by a linking assembly having first and second scissors-type linkages and a linking device." Pet. 14–15 (citing Ex. 1007, 3:11–19, 3:20–4:4, 7:4–20, Figs. 1, 20). According to Petitioner, Tsai's Figures 20 and 21 show Tsai's "linking assembly" comprises an outer retractable unit connected between every two adjacent supporting legs. *Id.* at 14–16 (citing Ex. 1007, Figs. 20–21; Ex. 1002 ¶ 68–69).

Patent Owner does not contest specifically Petitioner's arguments with respect to this limitation. *See* PO Resp. 62 (chart).

Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Tsai discloses or suggests limitation [8B].

d) [8C] a plurality of inner retractable units connected to each supporting leg ["inner units"], wherein said outer retractable units

and said inner retractable units form a roof frame for said collapsible canopy ["roof frame"]

Petitioner contends that Rousselle, Tsai, or both disclose or suggest limitation [8C]. Pet. 19–26.

Regarding "a plurality of inner retractable units connected to each supporting leg ['inner units']," Petitioner argues that Rousselle discloses a plurality of inner units (each comprised of band bar 320, hinge 450, and center tube 500) and discloses that an inner unit is connected to each supporting leg (leg tube 310, via hinge 312). *Id.* at 20–21 (citing Ex. 1005, 6:57–64, Figs. 1A–1C; Ex. 1002 ¶ 82). Petitioner also argues that Rousselle's inner units are retractable "at least because they are designed to extend and retract relative to the center of the canopy," and because "they are designed to retract on themselves." *Id.* at 21–22 (citing Ex. 1005, Figs. 1A, 1D; Ex. 1002 ¶ 83).

Petitioner also argues that Tsai's canopy support rods 3, which consist of two rod members pivotally connected to one another by intermediate pivot connector 31, are "inner units that connect a supporting leg to the central hub of the canopy." *Id.* at 22–23 (citing Ex. 1007, 8:34–9:28, Fig. 20; Ex. 1002 ¶ 84). Petitioner further argues that "Tsai's canopy support rods are retractable because they are designed to extend and retract relative to the center of the canopy, including folding on themselves." *Id.* at 23–24 (citing Ex. 1002 ¶ 85; Ex. 1007, Figs. 20, 21). According to Petitioner, a person of ordinary skill would have understood that, when combining Tsai's inner retractable units (canopy support rods) with Rousselle's canopy, it would be preferred to retain Rousselle's hinge 450 and center tube 500, so as to connect Tsai's canopy support rod to both the upper and lower clevis of Rousselle. *Id.* at 24 (citing Ex. 1002 ¶ 86).

Regarding "said inner retractable units form a roof frame for said collapsible canopy ['roof frame']," Petitioner argues that, as shown in Rousselle's Figure 1(A), Rousselle's inner retractable units form a roof frame because they extend over the top of the canopy, supporting the roof formed by the sheet-material cover 200. *Id.* at 27–28 (citing Ex. 1005, 6:30–33, Fig. 1(A); Ex. 1002 ¶ 98). Petitioner also argues that, as shown in Tsai's Figure 20, Tsai's inner retractable units (e.g., canopy support rods 3) form a roof frame because they extend over the top of the canopy, supporting the roof cover. *Id.* at 28–29 (citing Ex. 1007, 7:4–20, Fig. 20; Ex. 1002 ¶ 99). Patent Owner further argues that Tsai's outer retractable units (e.g., linking assembly 100) form part of a roof frame because they extend around the edge of the top of the canopy, supporting the roof cover. *Id.* Thus, Petitioner asserts that Rousselle's frame, as modified by Tsai, discloses inner retractable units and outer retractable units that form a roof frame for the collapsible canopy. *Id.* (citing Ex. 1002 ¶ 100).

Patent Owner does not contest specifically Petitioner's arguments with respect to this limitation. *See generally* PO Resp. 62 (chart).

Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Rousselle, Tsai, or both discloses or suggests limitation [8C].

e) [8D] a center lock, wherein said plurality of inner retractable units are connected through said center lock, said center lock comprising:

Petitioner contends that Rousselle, Tsai, or both discloses or suggests limitation [8D]. Pet. 30–33. Petitioner asserts that Rousselle discloses "a novel locking mechanism 700" which connects the "upper and lower

devises[15] 400 and 600." *Id.* at 31 (citing Ex. 1005, 6:65–67). Petitioner also asserts that Rousselle's locking mechanism 700 along with the upper and lower clevises comprise a center lock, and as shown in Rousselle's Figure 1(A), are centrally located. *Id.* (citing Ex. 1005, Fig. 1(A); Ex. 1002 ¶ 104). Petitioner further argues that Rousselle's inner retractable units (e.g., band bars 320, hinges 450, and center tubes 500) are connected to both upper and lower clevises (400, 600) and thus are connected to, and through, the "novel locking mechanism." *Id.* (citing Ex. 1005, 6:61–67; Ex. 1002 ¶ 104).

Petitioner argues that although Tsai does not disclose a center lock, its inner retractable units (e.g., canopy support rods 3) are connected to, and through, a central hub (e.g., head 7). *Id.* at 32 (citing Ex. 1007, 9:11–13 ("one end of each canopy support rod 3 is secured to a fixed linkage 5 and the other end is secured to the head 7"), Fig. 20; Ex. 1002 ¶ 105). Thus, Petitioner also argues that if Tsai's inner retractable units are combined with Rousselle's canopy, Tsai's inner retractable units would connect to, and through, Rousselle's center lock, which is in the same place as Tsai's center hub. *Id.* at 33 (citing Ex. 1002 ¶ 105).

Patent Owner does not contest specifically Petitioner's arguments with respect to this limitation. *See generally* PO Resp. 62 (chart)[16].

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[15] Petitioner argues that Rousselle uses the terms "devises" and "clevises" interchangeably when referring to elements 400 and 600. Pet. 31 (citing Ex. 1002 ¶ 104 n.2.)

[16] We determined in our analysis of claim element [8B] "that Petitioner has sufficiently shown that Tsai discloses or suggests limitation [8B]." Petitioner does *not* rely on Rousselle for this limitation.

Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Rousselle, Tsai, or both, discloses or suggests limitation [8D].

f) [8D][i] a center top cap

Petitioner contends that Rousselle discloses or suggests limitation [8D][i]. Pet. 33–35. In particular, Petitioner argues that Rousselle's locking mechanism 700 includes a center top cap referred to as "upper clevis 400," which performs the same function in the same manner as the center top cap in the '710 patent. *Id.* at 34–35 (citing Ex. 1005, 6:65–7:19, Figs. 1(A), 1(D); Ex. 1002 ¶ 109). Petitioner also argues that, for example, Rousselle's upper clevis 400 is centrally located, and at the top of both the locking mechanism 700 and the canopy as a whole, and connects the inner retractable units. *Id.* (citing Ex. 1005, Figs. 1(A), 1(D); Ex. 1002 ¶ 109).

Patent Owner does not contest specifically Petitioner's arguments with respect to this limitation. *See generally* PO Resp. 62 (chart).

Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Rousselle discloses or suggests limitation [8D][i].

g) [8D][ii] a center pole, comprising:

Petitioner contends that Rousselle discloses or suggests limitation [8D][ii]. Pet. 35–36. Petitioner asserts that Rousselle's locking mechanism 700 includes a center pole referred to as "pin 710." *Id.* at 35 (citing Ex. 1005, 7:1–19, Figs. 1(D), 2(A)–2(C); Ex. 1002 ¶ 112).

Patent Owner does not contest specifically Petitioner's arguments with respect to this limitation. *See generally* PO Resp. 62 (chart).

Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Rousselle discloses or suggests limitation [8D][ii].

h) [8D][ii][1] a center pole top end rigidly connected to said center top cap

Petitioner contends that Rousselle discloses or suggests limitation [8D][ii][1]. Pet. 36–37. Petitioner asserts that the top end of Rousselle's pin 710 (the center pole top end) is rigidly connected to the upper clevis 400 (the center top cap) because Rousselle discloses the top end of pin 710 "can . . . be fixed directly to the upper clevis 400, such as being pressed, threaded, or welded directly thereto, or can be fixed thereto in any other known manner." *Id.* at 36 (citing Ex. 1005, 7:1–19, Fig. 1(D), 2(C); Ex. 1002 ¶ 115).

Patent Owner does not contest specifically Petitioner's arguments with respect to this limitation. *See generally* PO Resp. 62 (chart).

Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Rousselle discloses or suggests limitation [8D][ii][1].

i) [8D][ii][2] a center pole bottom end

Petitioner contends that Rousselle discloses or suggests limitation [8D][ii][2]. Pet. 37–38. Petitioner asserts that pin 710 includes a bottom end, as shown in Figure 2(C). *Id.* (citing Ex. 1005, 7:1–19, Figs. 1(D), 2(A)–2(C); Ex. 1002 ¶ 118).

Patent Owner does not contest specifically Petitioner's arguments with respect to this limitation. *See generally* PO Resp. 62 (chart).

Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Rousselle discloses or suggests limitation [8D][ii][2].

j) [8D][ii][3] a clamping groove

Petitioner contends that Rousselle discloses or suggests limitation [8D][ii][3]. Pet. 38–40. Petitioner asserts that Rousselle's pin 710 includes a "groove 712" that is clamped by the pin 731 to engage the locking mechanism. *Id.* at 39 (citing Ex. 1005, 7:20–35, Figs. 2(A)–2(C); Ex. 1002 ¶ 122).

Patent Owner does not contest specifically Petitioner's arguments with respect to this limitation. *See generally* PO Resp. 62 (chart).

Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Rousselle discloses or suggests limitation [8D][ii][3].

k) [8D][ii][4] a clamp locking part located at the lower end of said clamping groove

Petitioner contends that Rousselle discloses or suggests limitation [8D][ii][4]. Pet. 40–42. In particular, Petitioner asserts that Rousselle's pin 710 includes a rounded, widened area (clamp locking part) located at the lower end of groove 712. *Id.* at 41 (citing Ex. 1005, 7:20–35, Figs. 2(A)–2(C); Ex. 1002 ¶ 126).

Patent Owner does not contest specifically Petitioner's arguments with respect to this limitation. *See generally* PO Resp. 62 (chart).

Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Rousselle discloses or suggests limitation [8D][ii][4].

l) [8D][iii] a center bottom cap detachably connected to said center pole bottom end, said center bottom cap comprising:

Petitioner contends that Rousselle discloses or suggests limitation [8D][iii]. Pet. 42–43. In that regard, Petitioner asserts that Rousselle's

locking mechanism includes a "socket 720 fixed to the lower clevis 600," which together comprise a center bottom cap. *Id.* at 42 (citing Ex. 1005, 7:1–5, Figs. 1(D), 2(A); Ex. 1002 ¶ 129). Petitioner also asserts that socket 720 receives the bottom end of center pin 710, and comprises pin 731, which extends into groove 712 (clamping groove) to connect center pin 710 (and therefore the attached upper clevis 400 (center top cap)) to socket 720 and attached lower clevis 600 (center bottom cap). *Id.* at 42–43 (citing Ex. 1005, 7:20–31, Fig. 2(A); Ex. 1002 ¶ 129). Petitioner further asserts that Rousselle discloses that socket 720 (part of the center bottom cap) can be detached from center pin 710 (center pole) by "disengag[ing] the pin 731 from the groove 712 [clamping groove] in the center pin 710 [center pole]." *Id.* at 43 (citing Ex. 1005, 7:32–35, Figs. 1(D), 2(A); Ex. 1002 ¶ 129).

Patent Owner does not contest specifically Petitioner's arguments with respect to this limitation. *See generally* PO Resp. 62 (chart).

Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Rousselle discloses or suggests limitation [8D][iii].

m) [8D][iii][1] a spring loaded locking piece for engaging said clamping groove

Petitioner contends that Rousselle discloses or suggests limitation [8D][iii][1]. Pet. 44–45. Petitioner asserts that Rousselle's locking mechanism includes "ring 730" and attached "pin 731," which are pushed rightwardly in Figure 2(A) by "spring SP." *Id.* at 44 (citing Ex. 1005, 7:20–31, Fig. 2(A)). Petitioner also asserts that spring SP pushing ring 730 rightward causes "pin 731 [to] extend[] through a lateral hole in the socket member 720 into a groove 712 in the center pin 710." *Id.* at 44 (citing Ex. 1005, 7:20–31, Fig. 2(A); Ex. 1002 ¶ 132). Petitioner further asserts that

Rousselle's spring loaded locking piece is part of socket 720, which is "fixed to the lower clevis 600" and thus comprised in the center bottom cap. *Id.* at 45 (citing Ex. 1005, 7:1–31, Fig. 2(A); Ex. 1002 ¶ 132).

As discussed above in our claim construction section, II.C, Patent Owner argues this limitation should be construed under § 112(f). Patent Owner concludes that this limitation should be construed to mean: "(1) an elastic element and an integral member with a through hole featuring a clamping hole part; or (2) a push piece combined with an elastic wire with a through hole featuring an elastic deforming part." PO Resp. 36 (heading "ii").

As discussed above, we determine that § 112(f) does *not* apply to the limitation "spring loaded locking piece for engaging said clamping groove," and therefore we do not adopt Patent Owner's proposed construction for this limitation. *See supra* Section II.C. Thus, based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Rousselle discloses or suggests limitation [8D][iii][1].

n) [8D][iii][2] a clamp locking part receiving section for receiving said clamp locking part

Petitioner contends that Rousselle discloses or suggests limitation [8D][iii][2]. Pet. 45–47.

Patent Owner does not contest specifically Petitioner's arguments with respect to this limitation. *See generally* PO Resp. 62 (chart).

Based on Petitioner's arguments and evidence, we determine Petitioner has sufficiently shown that Rousselle discloses or suggests limitation [8D][iii][2].

o) [8E] wherein when said center lock is in a locked state, said spring loaded locking piece is engaged with said clamping groove and said clamp locking part is inserted into said clamp locking part receiving section ["locked state"], wherein when said center lock is in an unlocked state said center pole is detached from said center bottom cap ["unlocked state"]

Petitioner contends that Rousselle discloses or suggests limitation [8E]. Pet. 48–50. In regard to the "locked state," Petitioner argues that Rousselle's Figure 2(A) shows the locking mechanism in the locked state in which "pin 731 (part of the spring loaded locking piece) 'extends . . . into a groove 712 in the center pin 710' and thus is engaged with the clamping groove (groove 712)." *Id.* at 48–49 (citing Ex. 1005, 7:20–31, Fig. 2(A)). Petitioner also argues that pin 710, including its lower end portion (the clamp locking part), is inserted into the central bore 723 (the clamp locking part receiving section). *Id.* at 49 (citing Ex. 1005, 7:20–31, Fig. 2(A); Ex. 1002 ¶ 139).

In regard to the "unlocked state," Petitioner argues Rousselle discloses that "[i]n order to disengage the clevises, the ring 730 can be moved laterally . . . against the force of the spring SP to disengage the pin 731 from the groove 712 in the center pin 710." *Id.* at 49 (citing Ex. 1005, 7:32–35). Petitioner also argues that this allows the user to "unlock the vertical pin 710 from the socket 720 mounted on the lower clevis 600." *Id.* (citing Ex. 1005, 14:44–50). Petitioner further asserts that a person of ordinary skill would have understood that once the pin 710 is unlocked from the socket 720, the pin 731 is no longer engaging or retaining the pin 710, and thus the pin 710 (center pole) is detached from the socket 720 and lower clevis 600 (center bottom cap). *Id.* (citing Ex. 1002 ¶ 142).

Patent Owner asserts that this clause should be governed by § 112 (f) (PO Resp. 63), an argument we have rejected. Patent Owner also argues that statements made by the Chinese Patent Office (CNIPA) identify differences between Rousselle and claim 8. PO Resp. 63–64 (citing Ex. 2001). We considered this evidence but give it minimal probative weight based on the differences in laws between the U.S. and China and the different evidence in the records of each proceeding. Applying United States law, we find that Rouselle discloses a spring loaded locking piece (i.e., the combination of ring 730 and pin 731) that is engaged with a clamping groove (i.e., groove 712) in the locked state. *See* Ex. 1005, Figs. 2A, 2C.

Based on Petitioner's arguments and evidence as summarized above, we determine Petitioner has sufficiently shown that Rousselle discloses or suggests limitation [8E].

p) Motivation to combine Rousselle and Tsai with a reasonable expectation of success

Petitioner contends a person of ordinary skill in the art would have been motivated to combine Rousselle and Tsai and would have had a reasonable expectation of success in doing so. Pet. 17–19 (citing Ex. 1002 ¶¶ 70–79), 25–26 (citing Ex. 1002 ¶¶ 87–94). In particular, Petitioner asserts that a person of ordinary skill would have been motivated to include Tsai's outer retractable units in Rousselle's canopy because Tsai discloses the benefits of such units, including increased canopy stability. *Id.* at 17 (citing Ex. 1007, 1:26–2:11, 2:12–32; Ex. 1002 ¶¶ 70–76). Petitioner also asserts that outer retractable units like those disclosed in Tsai were well-known, leading a person of ordinary skill to reasonably expect success in the combination. *Id.* (citing Ex. 1002 ¶ 73; Exs. 1009–1011). Petitioner further argues that the combination represents nothing more than the simple

addition of one known element (Tsai's outer retractable unit) to another known element (Rousselle's shelter/tent) to obtain predictable results (a shelter/tent as in Rousselle with outer retractable units). *Id.* at 18 (citing Ex. 1002 ¶¶ 74–76; *KSR*, 550 U.S. at 417).

Petitioner argues that a person of ordinary skill in the art would have understood that Tsai's folding inner retractable units would allow for a more compact collapsed canopy, and provide increased stability. *Id.* at 25 (citing Ex. 1002 ¶¶ 88–89). Petitioner also argues that inner retractable units, such as those disclosed in Tsai, were well-known, leading a person of ordinary skill to reasonably expect success in the combination. *Id.* at 26 (citing Ex. 1002 ¶ 91; Exs. 1006, 1009–1011). Petitioner further argues that the combination represents nothing more than the simple addition of one known element (Tsai's inner retractable unit) to another known element (Rousselle's shelter/tent) to obtain predictable results (a shelter/tent as in Rousselle with folding inner retractable units). *Id.* (citing Ex. 1002 ¶¶ 92–94; *KSR*, 550 U.S. at 417).

Patent Owner argues "CNIPA confirmed on February 9, 2021 the 'novelty' and 'non-obvious[ness]' of a CN claim over Rousselle hypothetically combined with a significant canopy frame." PO Resp. 68 (citing Ex. 2001, 16, 17, 26). Patent Owner also asserts "[t]he CN claims 1 and 15 are comparable to challenged claim 8." *Id*.

After considering the arguments of Petitioner and Patent Owner, we determine that Petitioner has provided sufficient reasoning, with rational underpinning, why a person having ordinary skill in the art would have been motivated to combine Tsai with Rousselle in the manner Petitioner proposes, with a reasonable expectation of success.

q) Secondary Considerations

Patent Owner argues that "[s]econdary evidence of non-obviousness supports a conclusion that claims 8, 9 and 11 are valid." PO Resp. 66 (heading "D"). The "secondary evidence" on which Patent Owner relies is the "existence of patents granted on the invention in other countries, like China and Japan" (PO Resp. 67), superior utility of the claimed invention relative to the prior art (*id*. at 68), "Petitioner's copying or imitating the patented technology" (*id*. at 72), and attempts to license the patented technology (*id*. at 74).

Objective indicia of non-obviousness play an important role as a guard against the statutorily proscribed hindsight reasoning in the obviousness analysis. *WBIP, LLC v. Kohler Co*., 829 F.3d 1317, 1328 (Fed. Cir. 2016). "[E]vidence of secondary considerations may often be the most probative and cogent evidence in the record." *Stratoflex, Inc. v. Aeroquip Corp*., 713 F.2d 1530, 1538 (Fed. Cir. 1983). "[E]vidence rising out of the so-called 'secondary considerations' must always when present be considered en route to a determination of obviousness." *Id*. at 1538. We have done so in this proceeding.

To the extent Patent Owner implies that its technology was copied by Petitioner, it is well established that not every competing product that arguably falls within the scope of a patent is evidence of copying; otherwise, "every infringement suit would automatically confirm the nonobviousness of the patent." *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1325 (Fed. Cir. 2004).

Second, objective evidence of nonobviousness is relevant only if there is a nexus between this evidence and the claimed invention. *Fox Factory,*

Inc. v. SRAM, LLC, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (*Fox Factory I*); *Fox Factory, Inc. v. SRAM, LLC*, 813 F. App'x 539, 542 (Fed. Cir. 2020) (*Fox Factory II*). The question of nexus is highly fact specific, and it is Patent Owner's burden to establish a sufficient nexus. *Fox Factory I*, 944 F.3d at 1373. A presumption of nexus applies if the asserted objective evidence "is tied to a specific product and that product 'embodies the claimed features, and is coextensive with them.'" *Id.* (quoting *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1072 (Fed. Cir. 2018)). To the extent that a presumption of nexus does not apply, Patent Owner may still prove nexus "by showing that the evidence of secondary considerations is the 'direct result of the unique characteristics of the claimed invention.'" *Id.* (quoting *In re Huang*, 100 F.3d 135, 140 (Fed. Cir. 1996)).

Patent Owner does not provide any evidence to demonstrate a nexus between the claimed invention of the '710 patent and the purported objective evidence. Patent Owner has not shown that the asserted objective evidence is tied to a specific product of Patent Owner and that product embodies the claimed features, and is coextensive with them. *Fox Factory I*, 944 F.3d at 1373. Nor has Patent Owner shown that the evidence of secondary considerations is the direct result of the unique characteristics of the claimed invention.

r) Summary

Based on the evidence and analysis discussed above, we determine Petitioner has established by a preponderance of the evidence that claim 8 is unpatentable based on Rousselle and Tsai.

4. Claims 9 and 11

Dependent claims 9 and 11 each depend directly from independent claim 8. Petitioner presents argument and evidence as to why these claims are unpatentable based on Rousselle and Tsai. *See* Pet. 50–53. Patent Owner does not specifically address claims 9 and 11. Accordingly, we determine that Petitioner has established by a preponderance of the evidence that claims 9 and 11 are unpatentable based on Rousselle and Tsai.

E. Grounds 2 and 3: Claims 8, 9, and 11 as Obvious Over Chang and Tsai (Ground 2) or Tsai in view of Rousselle or Chang (Ground 3)

Petitioner contends that claims 8, 9, and 11 would have been obvious over Chang and Tsai (Ground 2, Pet. 53–87), or reversing positions of the references in Grounds 1 and 2, Tsai in view of Rousselle or Chang (Ground 3, Pet. 87–93). Ground 3 merely duplicates Grounds 1 and 2, but reverses the order of the references. The order of references, however, is irrelevant. *See, e.g., In re Bush*, 296 F.2d 491, 496 (CCPA 1961) ("[i]n a case of this type where a rejection is predicated on two references each containing pertinent disclosure which has been pointed out to the applicant, we deem it to be of no significance, but merely a matter of exposition, that the rejection is stated to be on A in view of B instead of B in view of A, or to term one reference primary and the other secondary."); *see also In re Cook*, 372 F.2d 563, 566 n.4 (CCPA 1967). Accordingly, Ground 3 rises or falls with Grounds 1 and 2.

As noted above, Patent Owner groups Grounds 1, 2, and 3 together and argues them as a single ground. *See* PO Resp. 87.

We discuss below the new reference, Chang, in Ground 2.

1. Summary of Chang (Ex. 1006)

We make the following findings of fact concerning Chang.

Chang, titled "A tent which is pitched and disassembled by one touch," relates to "a tent which is pitched and disassembled like an umbrella by one touch." Ex. 1006, code (54), 1:6–9. Figure 11 of Chang is reproduced below.

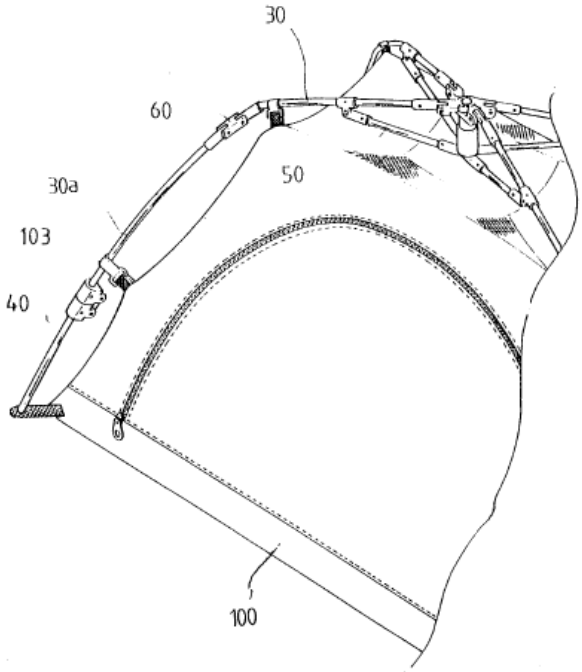


Figure 11 of Chang depicts an example of a tent frame and tent-sheet 100, including a tent leg assembly. *Id.* at 6:5–6. As shown in Figure 11, each of the tent's leg poles 40 is connected with flexible pole 30a, which is connected via hinge assembly 60 with flexible pole 30, which is connected to upper hub assembly 10 and to supporting pole 50, which is connected to lower hub assembly 20. *Id.* at 9:9–17, Figs. 1, 11.

Figure 8B of Chang is reproduced below.

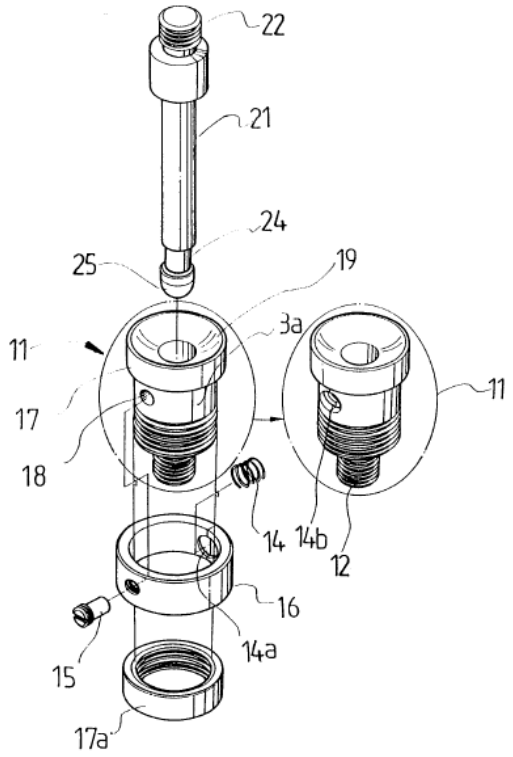


Figure 8B depicts lock pipe 11 and lock pin 21 for combining the tent canopy's upper and lower hub assemblies to prevent their separation. *Id.* at 5:20–21, 14:5–8.

Chang also describes that its "tent can be folded or unfolded easily." *Id.* at 18:21–22 (claim 6); *see, e.g.*, *id.* at 11:16–24, Figs. 11, 15, 17A. For example, as shown above, Figure 11 of Chang depicts a tent in an unfolded state, whereas Figure 17A of Chang, reproduced below, depicts a tent in a folded state.

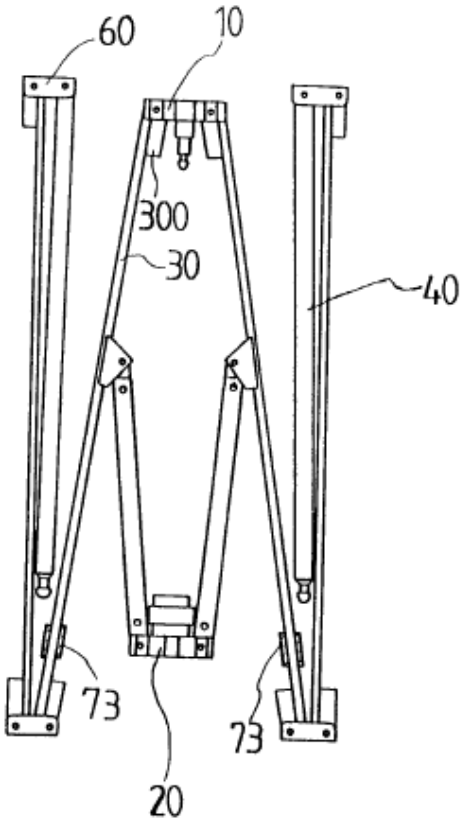


Figure 17A of Chang depicts a tent frame and canopy in a folded state, with upper hub assembly 10 and lower hub assembly 20 separated from one another. *Id.*

Patent Owner acknowledges that Chang and Rousselle disclose the same elements in regard to claim 8. *See* PO Resp. 62 (chart comparing disclosures of Rousselle, Chang, and Tsai to the limitations in claim 8).

2. Claim 8

Petitioner contends that the combination of Chang and Tsai renders obvious claim 8. Pet. 55–83. In its Response, Patent Owner asserts that ground 2 fails for the same reasons as ground 1. *See* PO Resp. 57 (arguing Grounds 1-3 collectively, as a group). In particular, Patent Owner asserts that Chang discloses the same subject matter as Rousselle, but Petitioner failed to rebut the differences that convinced the CNIPA that the claims

were nonobvious over Rousselle, which has essentially the same lock as Chang. *Id.* at 81, 84. Patent Owner does not dispute Petitioner's contentions with respect to claim 8's limitations, except for asserting that Chang's lock does not possess at least element D(iii)(1). *Id.* at 82–83.

On the current record, Petitioner sufficiently shows that the combination of Chang and Tsai teaches or suggests the limitations of claim 8 and provides sufficient reasoning with rational underpinning for combining the teachings as claimed. *See* Pet. 55–83. Petitioner asserts that Chang discloses the preamble of claim 8 because Chang discloses a collapsible canopy, e.g. "a tent which is pitched and disassembled like an umbrella by one touch," and that collapses during disassembly. *Id.* at 55–56 (citing Ex. 1006, code (57), Figs. 11, 17; Ex. 1002 ¶ 160). Petitioner also asserts that Chang discloses a centrally located locking mechanism comprising lock pipe 11, lock pin 12, and upper and lower hub assemblies. *Id.* at 57–58 (citing Ex. 1006, 14:5–8, Fig. 11; Ex. 1002 ¶ 161).

Regarding limitation 8[A] (supporting legs), Petitioner asserts that Chang's canopy comprises at least four supporting leg poles 40. *Id.* at 58 (citing Ex. 1006, 8:10–9:17, Figs. 11, 15, 18; Ex. 1002 ¶ 163). In regard to limitation 8[B] (outer units), Petitioner asserts that Tsai discloses this limitation for the reasons discussed regarding ground 1. *Id.* at 59–60 (citing Pet. § V.A.3.b; Ex. 1007, 3:20–4:4, 7:4–20, Fig. 20; Ex. 1002 ¶ 166). Petitioner also asserts that a person of ordinary skill in the art would have been motivated to combine Tsai's outer retractable units with Chang's canopy and frame for several reasons, including (1) increased stability, (2) outer retractable units like those disclosed in Tsai were well-known, leading a person of ordinary skill to reasonably expect success in the combination,

and (3) the combination represents nothing more than the simple addition of one known element (Tsai's outer retractable unit) to another known element (Chang's tent) to obtain predictable results (a tent as in Chang with outer retractable units). *Id.* at 59–60 (citing Pet. § V.A.3.b.ii; Ex. 1002 ¶¶ 167–172; Exs. 1009–1011; *KSR*, 550 U.S. at 417).

Regarding limitation 8[C] (inner units and roof frame), Petitioner asserts that Chang and Tsai disclose or at least suggest this limitation. *Id.* at 60–64. With respect to the inner units, Petitioner argues that Chang's flexible poles 30 and 30a, alone or in combination with supporting pole 50, form an inner unit that is connected to supporting leg pole 40, and that these inner units are retractable because they extend and retract relative to the center of the cavity, as well as retract on themselves. *Id.* at 60–61 (citing Ex. 1006, 9:9–17, Figs. 11, 17A; Ex. 1002 ¶¶ 175–176). Petitioner also argues that Tsai discloses this limitation for the reasons discussed regarding ground 1. *Id.* at 62 (citing Pet. § V.A.3.c.1.; Ex. 1002 ¶¶ 177–178). Petitioner further argues that a person of ordinary skill in the art would have been motivated to combine Tsai's inner retractable units with Chang's canopy and frame for several reasons, including increased stability, with a reasonable expectation of success. *Id.* at 62–63 (citing Exs. 1005, 1009–1011; Ex. 1002 ¶¶ 180–185; *KSR*, 550 U.S. at 417). With respect to the roof frame, Petitioner asserts that Chang's supporting legs and retractable units form "the frame of the tent," which supports a "tent-sheet." *Id.* at 63–64 (citing Ex. 1006, 9:23–10:1, Fig. 11). Petitioner also asserts that Tsai's inner and outer retractable units form part of a roof frame. *Id.* at 64 (citing Pet. § V.A.3.c.ii; Ex. 1007, Fig. 20; Ex. 1002 ¶ 188). Thus, according to Petitioner, Chang's frame, as modified by Tsai, discloses inner retractable

units and outer retractable units that form a roof frame for the collapsible canopy, and a person of ordinary skill would have been motivated to combine Chang with Tsai, and would have reasonably expected success in doing so. *Id.* (citing Pet. §§ V.B.2.b, V.B.2.c.i; Ex. 1002 ¶ 189).

Regarding limitation 8[D] (center lock), Petitioner argues that Chang discloses a locking mechanism comprising lock pipe 11 and lock pin 21, which locks together upper and lower hub assemblies 10 and 20, and is located in the center of the frame. *Id.* at 65–66 (citing Ex. 1006, 14:5–8, Figs. 8–8C; Ex. 1002 ¶¶ 192–193). Petitioner also argues that because Chang's lock includes upper hub assembly 10 and lower hub assembly 20, the inner retractable units (e.g., flexible poles (30 and 30a) alone or including supporting poles (50)) are connected to the locking mechanism. *Id.* at 66 (citing Ex. 1006, 9:1–17, 14:5–22, Fig. 11; Ex. 1002 ¶ 193). Further, Petitioner argues that because each of the inner retractable units (e.g., flexible poles 30, 30a, alone or including supporting poles 50) are connected to the center lock (e.g., to the upper and/or lower hub assembly), the inner retractable units are connected to each other through the center lock. *Id.* at 66–67 (citing Ex. 1006, 9:1–17, 14:5–22, Fig. 11; Ex. 1002 ¶ 193).

Petitioner asserts that Chang discloses or suggests limitation [D][i] (center top cap) because Chang's locking mechanism includes a center top cap referred to as upper hub assembly 10, which is centrally located at the top of the canopy. *Id.* at 67 (citing Ex. 1006, 9:1–8, 14:5–22, Figs. 8, 8B, 11, 15, 17A; Ex. 1002 ¶ 196).

Petitioner also asserts that Chang discloses or suggests limitation [D][ii] (center pole) because Chang's locking mechanism includes lock pin

21, which is located in the center of the locking mechanism. *Id.* at 68 (citing Ex. 1006, 9:1–8, 14:5–22, Figs. 8–8C; Ex. 1002 ¶ 199). Regarding limitation [D][ii][1] (center pole top end rigidly connected), Petitioner argues that Chang teaches or suggests this limitation because screw 22 on lock pin 21 (center pole), as shown in Figure 8B, rigidly connects to upper hub assembly 10 (center top cap). *Id.* (citing Ex. 1006, 9:1–8, 14:5–22, Figs. 8–8B; Ex. 1002 ¶¶ 202–203). Regarding limitation [D][ii][2] (center pole bottom end), Petitioner also argues that Chang teaches or suggests this limitation because lock pin 21 (center pole) includes a bottom end. *Id.* at 71 (citing Ex. 1006, 14:5–22, Figs. 8B–8C; Ex. 1002 ¶ 207). Petitioner further asserts that Chang teaches or suggests limitation [D][ii][3] (clamping groove) because Chang's round-shape groove 24 is a clamping groove that is clamped by the locking mechanism. *Id.* at 71–72 (citing Ex. 1006, 14:11–22, Figs. 8B–8C; Ex. 1002 ¶ 210). Petitioner further asserts that Chang teaches or suggests limitation [D][ii][4] (clamp locking part) because Chang's lock pin 21 includes a "protruded round (25)," which is a rounded, widened area (clamp locking part) located below round-shaped groove 24 (clamping groove). *Id.* at 72–73 (citing Ex. 1006, 14:11–15:3, Figs. 8B–8C; Ex. 1002 ¶ 213).

Regarding limitation [D][iii] (center bottom cap), Petitioner asserts that Chang teaches or suggests this limitation because Chang's lock pipe 11 is connected to lower hub assembly 20. In combination, lock pipe 11 and lower hub assembly 20 comprise the bottom cap, which is located in the center of the canopy. Pet. 73–76 (citing Ex. 1006, 9:1–8, 14:5–22, Figs. 8–8C, 11, 15, 17A; Ex. 1002 ¶¶ 216–217; *note also* annotated Figure 8C at Pet. 75).

Regarding limitation [D][iii][1] (spring loaded locking piece), Petitioner asserts that Chang teaches or suggests it because Chang discloses a spring loaded locking piece (operation hoop 16 and connection screw 15, spring loaded by spring 14) for engaging the clamping groove (round-shaped groove 24). *Id.* at 76–78 (citing Ex. 1006, 14:11–22, Figs. 8B–8C; Ex. 1002 ¶¶ 222–223). Petitioner also asserts Chang discloses that operation hoop 16 and connection screw 15 are connected to lock pipe 11 by protruded hoop 17a, which screws onto the bottom of lock pipe 11 and retains operation hoop 16 in place, so that Chang's spring loaded locking piece is part of the center bottom cap. *Id.* at 78–79 (citing Ex. 1006, 14:5–22, 15:7–13; Ex. 1002 ¶ 223). Petitioner further asserts that Chang teaches or suggests limitation [D][iii][2] (clamp locking part receiving section) because Chang's lock pipe 11 includes a bore that receives the lock clamping part, the bottom end of lock pin 21 (referred to as protruded round 25), which is inserted into lock pipe 11 attached to Chang's center bottom cap. *Id.* 79–80 (citing Ex. 1006, 14:5–15:3, Figs. 8B–8C; Ex. 1002 ¶ 226).

Petitioner argues that Chang discloses or at least suggests limitation [E] (locked and unlocked states). *Id.* at 80–82. Petitioner asserts that the left side of Figure 8C shows the locking mechanism in its locked state because "connection screw 15 (part of the spring loaded locking piece) is 'fitted into the round-shaped groove (24)' and thus is engaged with the clamping groove (round-shaped groove 24)." *Id.* at 80 (citing Ex. 1006, 5:22–23, 14:11–22, Fig. 8C; Ex. 102 ¶ 229). Petitioner also asserts that lock pin 21, including its lower end portion (the clamp locking part), is inserted into lock pipe 11, including its central bore (the clamp locking part receiving section). *Id.* at 80–81 (citing Ex. 1002 ¶ 229).

Petitioner asserts that the right side of Chang's Figure 8C shows the locking mechanism in its unlocked state with the center pole (lock pin 21) detached from the center bottom cap. *Id.* at 82 (citing Ex. 1006, Fig. 8C; Ex. 1002 ¶ 233). Petitioner also asserts that Chang discloses that "if the operation hoop (16) is pressed on the one side, the connection screw (15) is moved to the backward" and thus away from round-shaped groove 24 (clamping groove). *Id.* at 81 (citing Ex. 1006, 14:11–22, Fig. 8C). According to Petitioner, a person of ordinary skill would have understood that this would allow lock pin 21 to be removed from lock pipe 11, placing the locking mechanism into an unlocked state by detaching the center pole (lock pin 21) from the center bottom cap (including lock pipe 11). *Id.* at 81–82 (citing Ex. 1006, 14:11–22, Fig. 8C; Ex. 1002 ¶ 232).

The analysis of secondary considerations for Ground 1 applies equally to Ground 2.

Summary

Based on the evidence and analysis discussed above, we determine Petitioner has established by a preponderance of the evidence that claim 8 is unpatentable based on Chang and Tsai.

3. Claims 9 and 11

Dependent claims 9 and 11 each depend directly from independent claim 8. We have reviewed Petitioner's contentions with respect to these dependent claims and determine, based on the evidence and analysis discussed above, that Petitioner has established by a preponderance of the evidence that claims 9 and 11 are unpatentable based on Chang and Tsai.

For Ground 3, Patent Owner relies on the same arguments as those advanced for Grounds 1 and 2 of the Petition. Accordingly, in addressing

Patent Owner's arguments for Grounds 1 and 2, we have also addressed Patent Owner's arguments regarding Ground 3. Petitioner has established by a preponderance of the evidence that claims 8, 9, and 11 are unpatentable based on the assertions in Ground 3.

F. Grounds 4 and 5: Claim 7 as Anticipated or Obvious Over Ohnishi

Petitioner contends that claim 7 is anticipated by or would have been obvious over Ohnishi. Pet. 93–115.

1. Summary of Ohnishi (Ex. 1008)

We make the following findings of fact concerning Ohnishi.

Ohnishi, titled "Foldable Pushcart and Foldable Baby Carriage," "relates to a foldable pushcart that is reduced in size in front-back and width directions when folded, and a foldable baby carriage that is reduced in size in height and width directions when folded." Ex. 1008, code (54), 1:7–13. Figures 2 and 3 from Ohnishi are reproduced below.

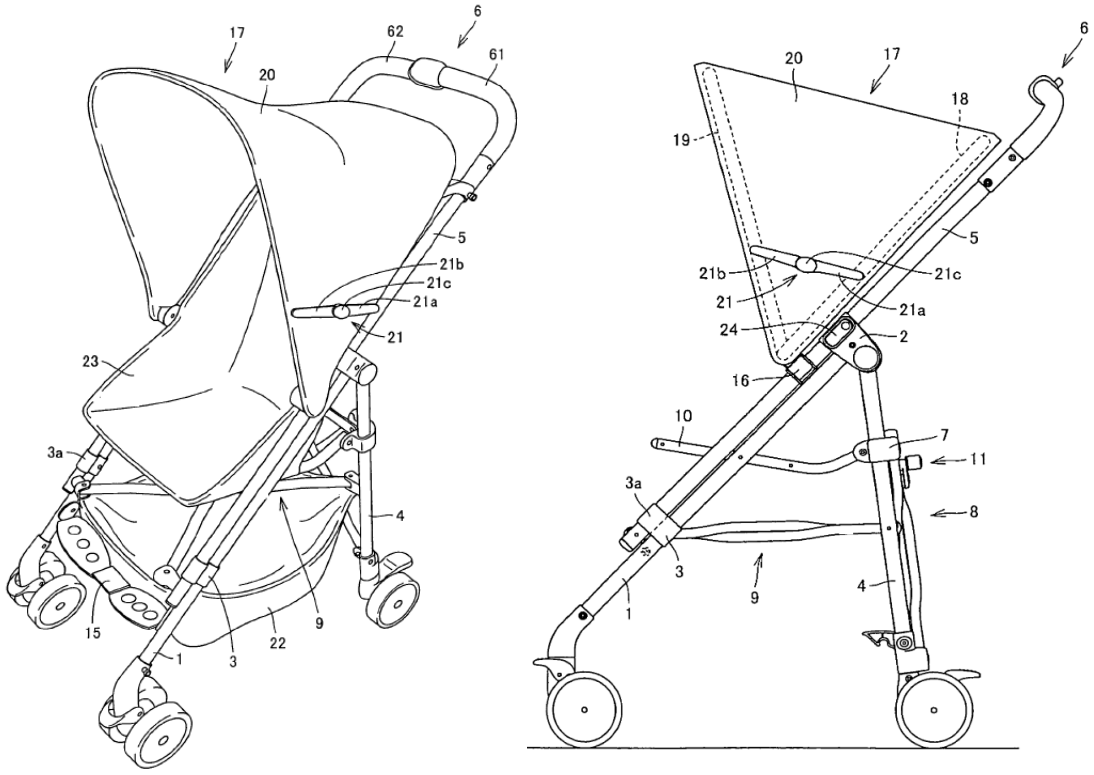


Figure 2 is a perspective view, and Figure 3 is a side view, of the disclosed pushcart/carriage in an open or unfolded state. *Id.* at 4:40–41. As shown in Figures 2 and 3, the baby carriage's body frame includes front legs 1, rear legs 4 push bars 5, handle member 6, support bars 10, back cross member 8, and bottom cross member 9. *Id.* at 4:43–48. Handle member 6 includes first and second L-shaped handle arms 61 and 62, the ends of which are separably connected to each other by a connecting mechanism. This structure is described in greater detail below with reference to Figures 9–11.

Figure 11 of Ohnishi is reproduced below.

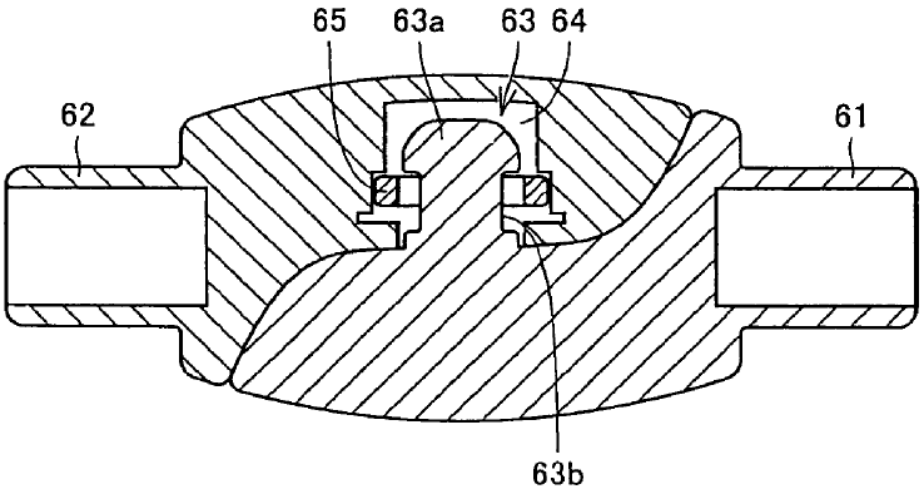


Figure 11 of Ohnishi depicts a top cross-sectional view of a connecting mechanism for separably connecting handle arms 61 and 62. *Id.* at 4:19–20. As shown in Figure 11, the connecting mechanism includes fixed shaft 63, which protrudes towards the rear of the baby carriage and is fixed to the inner end of first handle arm 61. *Id.* at 7:34–35, 7:36–37. The connecting mechanism also includes shaft receiving space 64—formed in the inner end of second arm handle 62 for receiving fixed shaft 63—and lock member 65.

Id. at 7:34–36. Lock member 65 is interposed between the head portion 63*a* of fixed shaft 63 and first handle arm 61. *Id.* at 7:65–67.

Figure 9 of Ohnishi is reproduced below.

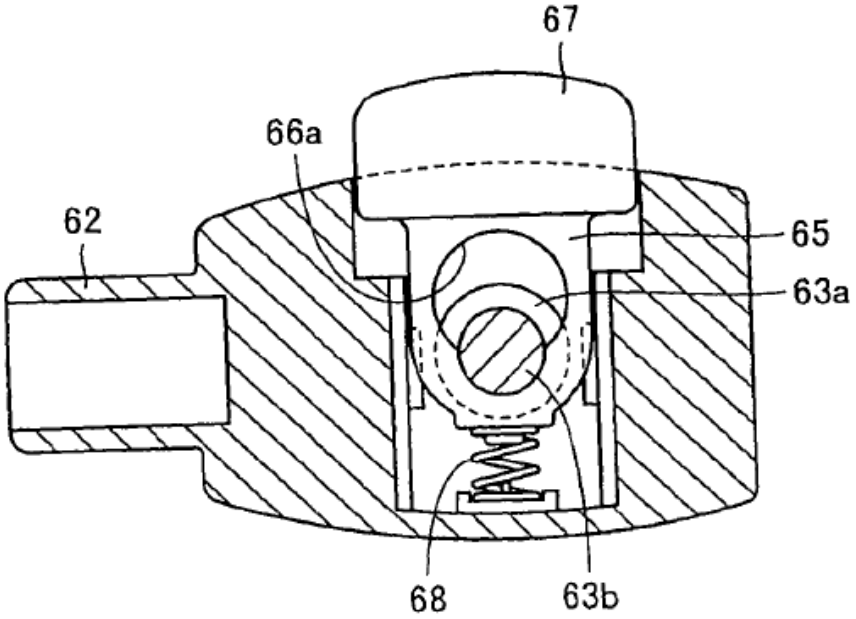


Figure 9 of Ohnishi depicts a front view of a main part of a connecting mechanism for separably connecting the first and second handle arms to each other. *Id.* at 4:15–17. As shown in Figure 9, fixed shaft 63, includes a head portion 63*a* of larger diameter and a neck portion 63*b* of smaller diameter. *Id.* at 7:36–39. The connecting mechanism includes lock member 65 located within shaft receiving space 64 of second handle arm 62, and operation member 67 fixed to an upper end of lock member 65. *Id.* at 7:51–53. In the middle of lock member 65 is through hole 66, which includes large-diameter hole 66*a* on the upper side and small-diameter hole 66*b* overlapping a lower part of hole 66*a* (shown in Figure 10). *Id.* at 7:40–46, Figs. 9, 10. Neck portion 63*b* of fixed shaft 63 is fixed to first handle arm 61 and fits in small-diameter hole 66*b* of lock member 65, which is supported by second handle arm 62. *Id.* at 7:61–64. Biasing member 68 (for

example, a coiled spring) is disposed between a lower end of lock member 65 and a bottom wall portion of second handle arm 62 and constantly biases lock member 65 upward. *Id.* at 7:56–59. In this way, the biasing force of biasing member 68 can maintain an engaged state in which first handle arm 61 and second handle arm 62 are in a fixedly connected state, corresponding to the open state of the baby carriage. *Id.* at 7:67–8:3.

To fold the baby carriage, operation member 67 may be pressed down to move lock member 65 to a lower position, such that large-diameter hole 66*a* is aligned with head portion 63*a* of fixed shaft 63. *Id.* at 8:4–8. Ohnishi states:

> Accordingly, by moving the inner end of the first handle arm 61 forward relative to the inner end of the second handle arm 62, the head portion 63*a* of the fixed shaft 63 passes through the large-diameter hole 66*a* of the lock member 65 and the first handle arm 61 and the second handle arm 62 are separated from each other.

Id. at 8:8–13.

Fig. 12 of Ohnishi is reproduced below.

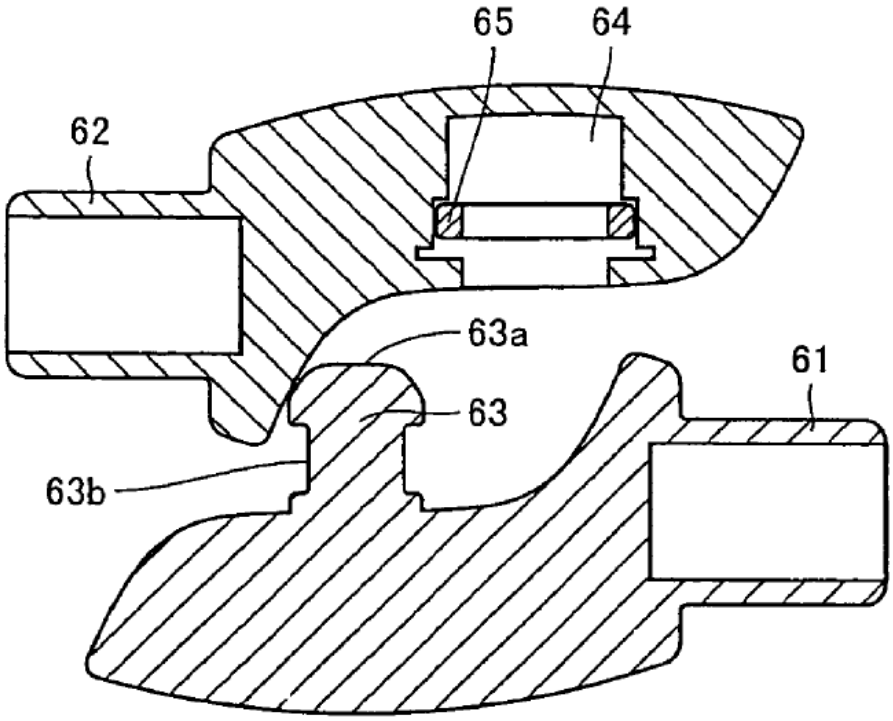


Fig. 12 of Ohnishi depicts a state in which first and second handle arms 61 and 62 have been separated from each other in the folded state of the baby carriage. *Id.* at 8:14–17; *see also id.*, Fig. 4 (showing a folded state of the baby carriage).

2. Claim 7

Claim 7 is directed to a central lock. Ex. 1001, 12:62. It does *not* include a collapsible canopy, as does claim 8.

Petitioner contends that Ohnishi anticipates or renders obvious claim 7 of the '710 patent. Pet. 94. Petitioner asserts that claim 7 is for a "central lock" (preamble) that includes many of the same elements as the lock claimed as part of claim 8 (e.g., center top cap, center pole, clamping groove, clamp locking part, center bottom cap, locking piece), but does not claim the canopy elements. *Id.* at 93 (citing Ex. 1002 ¶ 274). Petitioner also asserts that claim 7 recites the locking piece includes a first through hole composed of a smaller clamping hole part 411 and a larger through hole part

412 arranged side by side, and that the clamping hole part 411 clamps around the clamping groove when the lock is locked. *Id.* at 94 (citing Ex. 1001, Fig. 13, 7:58–8:17).

In regard to ground 4, Petitioner asserts that Ohnishi discloses each limitation of claim 7 and, therefore, anticipates claim 7. *Id.* at 96–113. In regard to ground 5, Petitioner asserts that to the extent Patent Owner argues Ohnishi does not disclose the positional aspects of the limitations of claim 7 (e.g., "that an upper end surface of its claimed locking part abuts against a lower end surface of its locking piece"), arranging Ohnishi's lock to meet those limitations would have been obvious to a person of ordinary skill for several reasons. *Id.* at 113–115 (citing Ex. 1002 ¶¶ 312–316).

In its Response, Patent Owner argues that ground 4 fails because Ohnishi does not show or describe a lock with an "abutment of parts" as recited by limitation [G] (identified below). PO. Resp. 41–42. Patent Owner also argues that ground 5 fails because, although Petitioner argues it would have been obvious to turn the lock upside down, "[t]he missing abutment of parts has not been shown to be obvious because the nuance was not appreciated or discussed." *Id.* at 75–77. In view of Patent Owner's arguments, we focus our analysis of grounds 4 and 5 on limitation [G] of claim 7.

a) Analysis Regarding Limitation [G]

Petitioner identifies the limitations of claim 7 as [A]–[I], and limitations [F][1], [F][2], and [G] recite the following:

[F][1] a portion of the other end of the center pole (2) is provided with a clamping groove (21) and

> [F][2] a clamp locking part (22) located at the lower end of the clamping groove (21);
>
> [G] when the central lock is in a locked state, part of an inner wall of the first through hole (41) of the locking piece (4) is clamped with the clamping groove (21) of the center pole (2), *and an upper end surface of the clamp locking part (22) abuts against a lower end surface of the locking piece (4).*

See Pet. 105–109 (emphasis added); Ex. 1001, 13:2–10.

Petitioner contends that Ohnishi teaches or suggests limitation [G]. Pet. 107–109. Petitioner argues that, when Ohnishi's connection mechanism is locked, "the neck portion 63b of the fixed shaft 63 . . . fits in the small-diameter hole 66b of the lock member 65[.]" *Id.* at 107 (citing Ex. 1008, 7:61–8:3). Thus, Petitioner also argues that in the locked state, part of Ohnishi's first through hole (small-diameter hole 66b) is clamped with the clamping groove (neck portion 63b) of the center pole, as shown in Figure 9. *Id.* at 107–108 (citing Ex. 1008, Fig. 9; Ex. 1002 ¶ 300). Petitioner's annotated version of Figure 9 is reproduced below.

FIG. 9

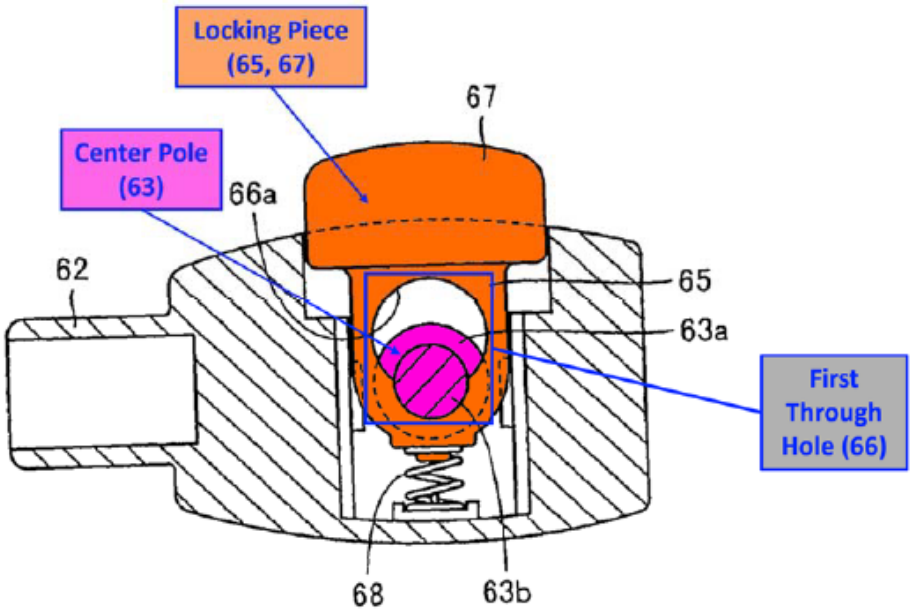
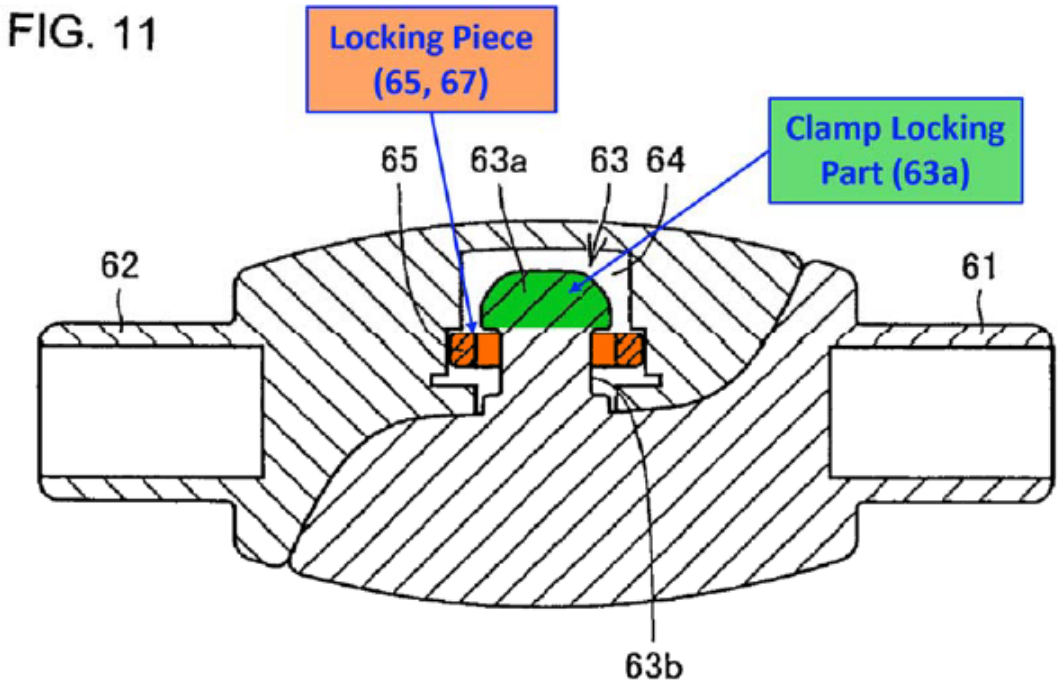


Figure 9 is a front view of a main part of a connecting mechanism for separably connecting the first handle arm (61) and second handle arm (62) to each other. Ex. 1008, 4:15–17. According to Petitioner, operation member 67 is fixed to an upper end of lock member 65, so that when the user presses operation member 67, both operation member 67 and lock member 65 move along a radial direction of the center pole (fixed shaft 63). Pet. 103–104.

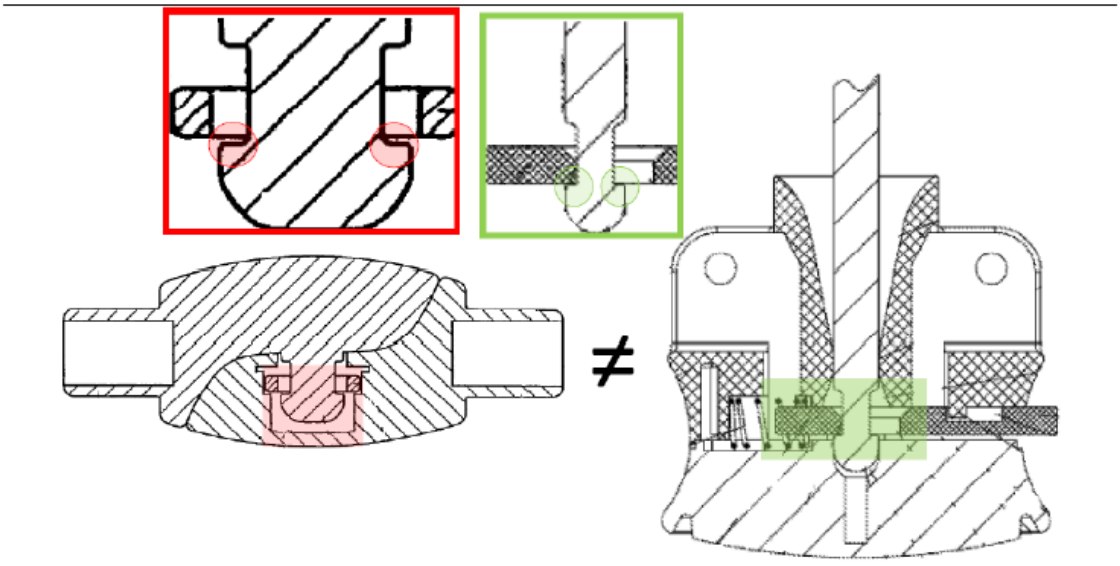
Petitioner further argues that in the locked state, Ohnishi's "lock member 65 is interposed between the head portion 63a of the fixed shaft 63 and the first handle arm 61." *Id.* at 108 (citing Ex. 1008, 7:61–8:3). Petitioner then argues that, "in the locked state, an upper end surface of the clamp locking part (head portion 63a) abuts a lower end surface of the locking piece (which includes lock member 65)." *Id.* (citing Ex. 1008, Fig. 11; Ex. 1002 ¶ 301). Petitioner asserts that Figure 11 shows this. *Id.* (citing Ex. 1008, Fig. 11; Ex. 1002 ¶ 301).

Petitioner's annotated version of Figure 11 is reproduced below.



Ex. 1008, Fig. 11. Annotated Figure 11 is a top cross-sectional view of the connecting mechanism of Ohnishi and shows first handle 61 and second handle 62 in a locked state. Ex. 1008, 4:19–20.

Patent Owner argues that Ohnishi does not show or describe a lock with an abutment of parts recited by limitation [G] because, as shown in Patent Owner's annotated figures in Table 4, Ohnishi depicts "the giant gap (highlighted in red circles) between a 'clamp locking part' of a pole and a 'locking piece[],'" rather than limitation [G]'s abutment of parts (highlighted in green circles), as can be seen in a preferred embodiment of claim 7. PO Resp. 42 (citing Table 4). Patent Owner's annotated figures in Table 4 are reproduced below.



PO Resp. 42 (citing Ex. 1001, Fig. 6; Ex. 1008, Fig. 11 (turned upside down)). Patent Owner argues that claim 7 has "textbook novelty under §102 over Ohnishi" because, as shown in red highlighting in the figures on the left from Ohnishi, an upper end surface of the clamp locking part 63a does not abut against a lower end surface of the locking mechanism 65, as required by limitation [G]. *Id.*

Patent Owner also argues it makes sense that limitation [G] would be missing from the disclosure of Ohnishi because "Ohnishi's baby-stroller lock is configured for a laterally-collapsible frame instead of vertically-collapsible canopy frame." PO Resp. 43. According to Patent Owner, just looking at the cross-section of Ohnishi's lock demonstrates that limitations [G] and [F] "would not be inherently met" by the disclosure of Ohnishi, because (1) first handle arm 61 is in front of second handle arm 62, which means that the arms "share a same altitude," and (2) "[t]he fixed shaft 63 protrudes toward the rear of the baby carriage" (*id*. at 43–44), which arrangement is different from the center bottom cap and the center top cap

that are vertically arranged relative to one another. PO Resp. 45–46. Patent Owner asserts that Ohnishi is a lateral-lock that maintains a gridlock against the frame's lateral collapse. *Id.* at 46 (citing Ex. 1008, Figs. 6–8, 12). Patent Owner also asserts that, unlike a collapsible canopy centerpiece lock, the lateral lock of Ohnishi "does not bear any automatic forces toward a vertical separation of the lateral-lock's two parts," which is just one of the reasons why it makes sense that Ohnishi also fails to inherently disclose limitation [G]. *Id.*

Regarding the lack of abutting parts, Petitioner asserts "a POSITA would have understood Ohnishi to disclose that the two parts touch, and therefore abut." Reply 30 (citing Ex. 1102 ¶¶ 35–39; Ex. 1101, 168:20–170:3 (admitting the parts "possibly" touch), 170:5–172:3, 173:11–18). Petitioner also asserts that a "POSITA would have understood that, just as in the '710 patent, Ohnishi's clamp locking part and locking piece would be in contact when the lock is in a locked state." *Id.* at 31.

b) Analysis and Conclusion

"A determination that a patent is invalid as anticipated under 35 U.S.C. § 102 requires that a prior art reference disclose every limitation of the claimed invention, either explicitly or inherently." *Liebel-Flarsheim Co. v. Medrad, Inc*., 481 F.3d 1371, 1381 (Fed. Cir. 2007) (citation omitted). 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*, 545 F.3d at 1369 (quoting *Connell v. Sears, Roebuck & Co*., 722 F.2d 1542, 1548 (Fed. Cir. 1983)). Here, based on the evidence, we are left

with the clear view that Ohnishi's disclosure does not meet the rigorous demands of anticipating claim 7 for the reasons advanced by Patent Owner. As asserted by Patent Owner, Ohnishi does not disclose all elements of claim 7 within the four corners of the document, and arranged as in claim 7. Moreover, Petitioner also has not met its burden to establish with a preponderance of the evidence that claim 7 would have been obvious based on Ohnishi. Petitioner has not established with persuasive evidence why it would have been obvious to modify Ohnishi, with a reasonable expectation of success, so that the locking parts abut against each other as claimed.

Based on the evidence, we agree with Patent Owner that Petitioner has not sufficiently shown that Ohnishi discloses or suggests limitation [G] of claim 7. In that regard, we determine Petitioner's argument, and Dr. Stein's testimony, that "in the locked state, an upper end surface of the clamp locking part (head portion 63a) abuts a lower end surface of the locking piece (which includes lock member 65)," are conclusory and fail to sufficiently explain why Ohnishi discloses, expressly or inherently, or suggests, that an upper end surface head portion 63a abuts against a lower end surface of locking piece 65.

III. CONTINGENT MOTION TO AMEND

Contingent on the determination that any of original claims 8, 9, or 11 are unpatentable, Patent Owner requests "that the Board grant this motion [to amend] and issue the corresponding substitute claims presented in the appended 'Listing of Claims.'" Mot. Amend. 1. Patent Owner did not request preliminary guidance from the Board in its Motion to Amend.[17]

[17] Under the "preliminary guidance" program, which applies to all AIA trial proceedings instituted on or after March 15, 2019, the patent owner is able to

As discussed above in Section II, Petitioner has established by a preponderance of the evidence that claims 8, 9, and 11 are unpatentable. Therefore, we consider Patent Owner's Motion to Amend.

A. Principles of Law

In an *inter partes* review, amended claims are not added to a patent as a matter of right, but instead must be proposed as a part of a motion to amend. 35 U.S.C. § 316(d). "Before considering the patentability of any substitute claims, . . . the Board first must determine whether the motion to amend meets the statutory and regulatory requirements set forth in 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121." *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 4 (PTAB Feb. 25, 2019) (precedential). A patent owner bears the burden of persuasion to show: (1) the amendment proposes a reasonable number of substitute claims; (2) the proposed substitute 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(a)(2), (a)(3), (d)(1); *Lectrosonics*, Paper 15 at 4–8. Petitioner, *not* Patent Owner, however, "bears the burden of persuasion to show, by a preponderance of the evidence, that any proposed substitute claims are unpatentable." 37 C.F.R. § 42.121(d)(2); *Lectrosonics*, Paper 15 at 4 (citing

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request preliminary non-binding guidance from the Board regarding a proposed preliminary amendment's compliance with the statutory and regulatory requirements. *See* 84 Fed. Reg. 9497 (Mar. 15, 2019).

Aqua Prods. Inc. v. Matal, 872 F.3d 1290, 1311 (Fed. Cir. 2017); *Bosch Auto. Serv. Sols. LLC v. Iancu*, 878 F.3d 1027, 1040 (Fed. Cir. 2017)).

B. Analysis of Motion to Amend

We begin our analysis with an overview of proposed substitute claims 12, 13, and 14, followed by a discussion of Patent Owner's compliance with the statutory and regulatory requirements for a motion to amend. Then we address Petitioner's assertions of unpatentability of the proposed substitute claims 12, 13, and 14.

1. Overview of Proposed Substitute Claims 12, 13, and 14

Proposed substitute independent claim 12, to replace independent claim 8, is reproduced below with crossed-out text and underlined text showing Patent Owner's amendments:

> 12. A collapsible canopy with a center lock, said collapsible canopy comprising:
>
> A. at least three supporting legs,
>
> B. a plurality of outer retractable units connected between every two adjacent supporting legs, and
>
> C. a plurality of inner retractable units connected to each supporting leg, wherein said outer retractable units and said inner retractable units form a roof frame for said collapsible canopy, and
>
> D. a center lock, wherein said plurality of inner retractable units are connected through said center lock, said center lock comprising:
>
> i. a center top cap,
>
> ii. a center pole, comprising:
>
> 1. a center pole top end rigidly connected to said center top cap,
>
> 2. a center pole bottom end,

3. a clamping groove, and

4. a clamp locking part located at the lower end of said clamping groove, and

iii. a center bottom cap detachably connected to said center pole bottom end, said center bottom cap comprising:

1. a spring loaded locking ~~piece~~ means for engaging said clamping groove, and

2. a clamp locking part receiving section for receiving said clamp locking part,

wherein when said center lock is in a locked state, said spring loaded locking ~~piece~~ means is engaged with said clamping groove and said clamp locking part is inserted into said clamp locking part receiving section, wherein when said center lock is in an unlocked state said center pole is detached from said center bottom cap.

Mot. Amend. 26–27 (Listing of Claims). Proposed substitute claim 13 (*id.* at 27–28) replaces claim 9. Proposed substitute claim 14 (*id.* at 28–29) replaces claim 11.

2. Reasonable Number of Substitute Claims

Patent Owner's proposal to substitute a single claim for each of challenged claims 8, 9, and 11 (*see* Mot. Amend 1–2) meets the requirement for a reasonable number of substitute claims. *See* 37 C.F.R. § 42.121(a)(3) (establishing a rebuttable presumption that only one substitute claim is needed to replace each challenged claim).

3. Enlargement of Claim Scope

Patent Owner asserts that proposed substitute claim 12 does not seek to enlarge the scope of the originally issued claim 8 because proposed substitute claim 12 "expressly invokes 35 USC § 112(f)." Mot. Amend. 1. Petitioner does not dispute Patent Owner's contention that proposed

substitute claim 12 does not seek to enlarge the scope of the challenged claims of the '710 patent. *See generally* Mot. Amend. Opp.

Based on the entire record, we determine that proposed substitute claims 12, 13, and 14 do not enlarge the scope of the claims of the '710 patent. *See* 37 C.F.R. § 42.121(a)(2)(ii) ("A motion to amend may be denied where . . . [t]he amendment seeks to enlarge the scope of the claims of the patent . . . .").

4. Support for Proposed Substitute Claims / New Matter

Patent Owner asserts that the priority documents of the '710 patent support the supplemental claims. Mot. Amend. 3. Patent Owner provides "a chart with the substitute claim limitations in the lefthand column with quotes or cites in the righthand column from the priority documents that support the claim limitations." *Id.* at 3–6. Petitioner does not dispute Patent Owner's assertions, so there are no disputes for us to resolve in this regard.

5. Responding to a Ground of Unpatentability

37 C.F.R. § 42.121(a)(2)(i) states that "[a] motion to amend may be denied where . . . [t]he amendment does not respond to a ground of unpatentability involved in the trial." Thus, in considering the motion, we review the entirety of the record to determine whether a patent owner's amendments respond to a ground of unpatentability involved in the trial.[18]

Original claims 8, 9 and 11 recite "a collapsible canopy with a center lock" where the "center lock" includes an element of "a spring loaded

[18] In addition to the references in the grounds asserted in this IPR proceeding, that is references "involved in the trial," Patent Owner identifies "Choi" (Ex. 2034) as part of the "closest known prior art." Mot. Amend. 11. Choi is a reference cited in a related patent application. *Id.* Petitioner does not address Choi in its Opposition or Sur-Reply to the Motion to Amend.

locking piece for engaging the clamping groove" and a recited configuration of a "locked state." Relative to original claim 8, substitute claim 12 expressly invokes 35 U.S.C. § 112(f) by simply changing the identified element to spring loaded "locking *means*," rather than "locking piece," for engaging the clamping groove. Mot. Amend. 1 (emphasis added). According to Patent Owner, this minor change is considered a narrowing amendment. *Id.*

Relative to original claim 9, Patent Owner asserts "substitute claim 13 has a narrowed scope because it recites a more limited 'spring loaded locking piece' and a more limited configuration of the 'locked state.'" *Id.*

Relative to original claim 11, Patent Owner asserts "substitute claim 13 [sic 14, *see id.* at 28 ("14. (Substitute for claim 11")"] has a narrowed scope because it recites a more limited 'spring loaded locking piece' and a more limited configuration of the 'locked state.'" *Id.* at 1–2.

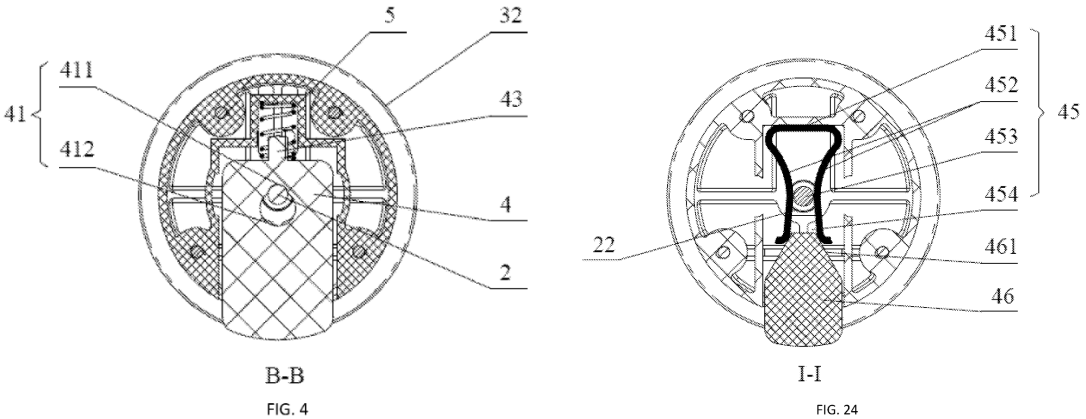
While Petitioner disputes the patentability of substitute claims 12–14, Petitioner does not dispute Patent Owner's assertions as to whether he substitute claims respond to a ground of unpatentability. We conclude that the substitute claims respond to a ground of unpatentability.

6. Patentability of Proposed Substitute Claims

a) Claim Construction

Patent Owner asserts that proposed substitute claim 12 recites a "spring loaded [locking] *means for engaging the clamping groove*," which "invokes § 112(f)." Mot. Amend. 6 (emphasis added). Patent Owner also asserts "[a]s a result, the element should be interpreted as the structures in the '710 [patent] specification that perform the recited function." *Id.*

Based on a means-plus-function construction, Patent Owner asserts that element D(iii)(1) should be construed to mean "(1) an elastic element and an integral member with a through hole featuring a clamping hole part; or (2) a push piece combined with an elastic wire with a through hole featuring an elastic deforming part," and their equivalents. *Id.* (heading (i)). "The first structure is taken from the first preferred embodiment of the 'spring loaded locking piece' in the specification." *Id.* at 7. "The second structure is taken from the second preferred embodiment of the 'spring loaded locking piece' in the specification." *Id.* at 8. These two embodiments have been discussed above and the key element at issue in this limitation, locking piece 4, from each embodiment is shown, respectively, in Figures 4 and 24 of the '710 patent, which are reproduced again below. *See also* Mot. Amend. 6–10 (discussing the locking piece and why, in Patent Owner's view, substitute claim 12 is not unpatentable over the prior art cited in the Petition).



Patent Owner acknowledges that its proposed construction for substitute claim 12 is the same as its argued construction for claim 8. Tr. 53:2–8.

We agree with Patent Owner that because substitute claim 12 uses the word "means," there is a presumption that § 112(f) applies. *Williamson*, 792 F.3d at 1348. Petitioner also agrees. Mot. Amend. Opp. 2.

In Petitioner's Reply in primary briefing in this proceeding, Petitioner asserted that "Even Under PO's Proposed § 112(f) Construction, Rousselle and Chang Disclose This Limitation" (Reply 13 (heading "b."), with "This Limitation" referring to the "spring loaded locking piece" (*id.* at 10 (heading "1")). Petitioner recognized in this Reply that the corresponding structure of the '710 patent was the same structure provided in the first and second disclosed embodiments in the written description. *Id*. at 13. Thus, Petitioner's asserted construction of the means-plus-function clause in substitute claim 12 was, and still is, the same as Patent Owner's. *See* Mot. Amend. Opp. 1 ("even if it invoked § 112(f), claim 8 (and thus proposed claim 12) would have been obvious over Rousselle, Chang, and/or Tsai"); 2 ("Proposed Claim 12's Means-Plus-Function Limitations are Disclosed by Rousselle and Chang," heading "A")); Tr. 9:15–24 ("So our view is, [claim 8] doesn't invoke 112(f). . . . But even if it is construed under 112(f), the structure is still disclosed by the prior art. So there are sort of two different arguments there, and we believe that under either one, we would prevail.").

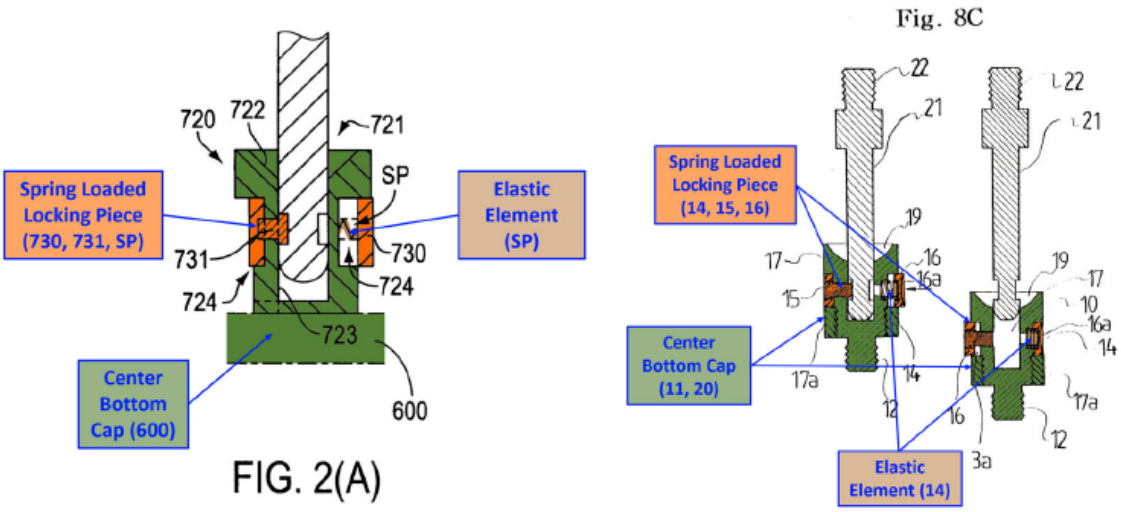
In considering the Motion to Amend, we will apply the construction of proposed substitute claim 12 that has been agreed-upon by the parties.

b) Substitute Claim 12
Spring Loaded Locking Means

We have discussed each limitation in substitute claim 12 in our discussion of claim 8. The only change in substitute claim 12 is the means-plus-function clause in claim 12. The corresponding disclosed structure for this clause is (1) an elastic element and an integral member with a through

hole featuring a clamping hole part; or (2) a push piece combined with an elastic wire with a through hole featuring an elastic deforming part. Mot. Amend. 6–10. Petitioner asserts "Rousselle and Chang disclose this limitation because they disclose an elastic element and an integral member with a through hole featuring a clamping hole part." Mot. Amend. Opp. 2 (citing Ex. 1102 ¶¶ 14–33, 48).

Petitioner asserts Rousselle and Chang both disclose an elastic element (e.g., a spring). *Id.* at 3. According to Petitioner, "Rousselle and Chang disclose that Rousselle's ring 730 and Chang's hoop 16 are pushed rightward by Rousselle's spring SP and Chang's spring 14." *Id.* Petitioner provides the following annotated figures from Rousselle (Fig. 2(A), on the left) and from Chang (Fig. 8C, on the right), reproduced below. *Id.*



Petitioner asserts that spring SP in Rousselle and spring 14 in Chang "are elastic elements." *Id.* (citing Ex. 1102 ¶¶ 18–19; Ex. 1101, 196:22–197:15).

Petitioner also asserts that Rousselle and Chang each disclose an "integral member with a through hole featuring a clamping hole part." Mot. Amend. Opp. 3. According to Petitioner, Rousselle discloses a "ring 730"

with attached "pin 731," which a person or ordinary skill "would have understood comprise an integral member." Mot. Amend. Opp. 3. Petitioner provides the following annotated Figure 2(A) to illustrate its argument. *Id.* at 4.

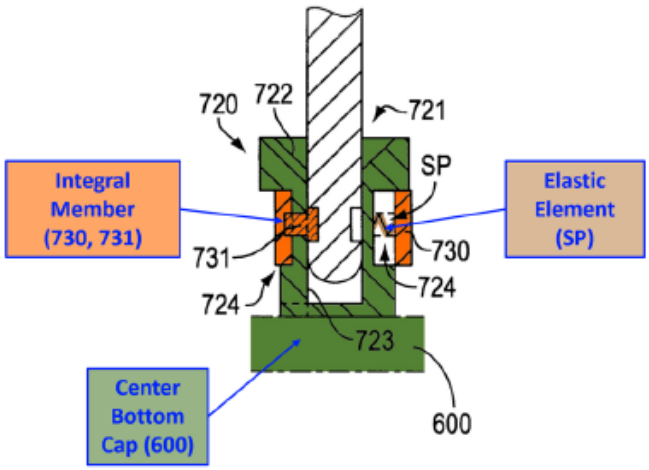
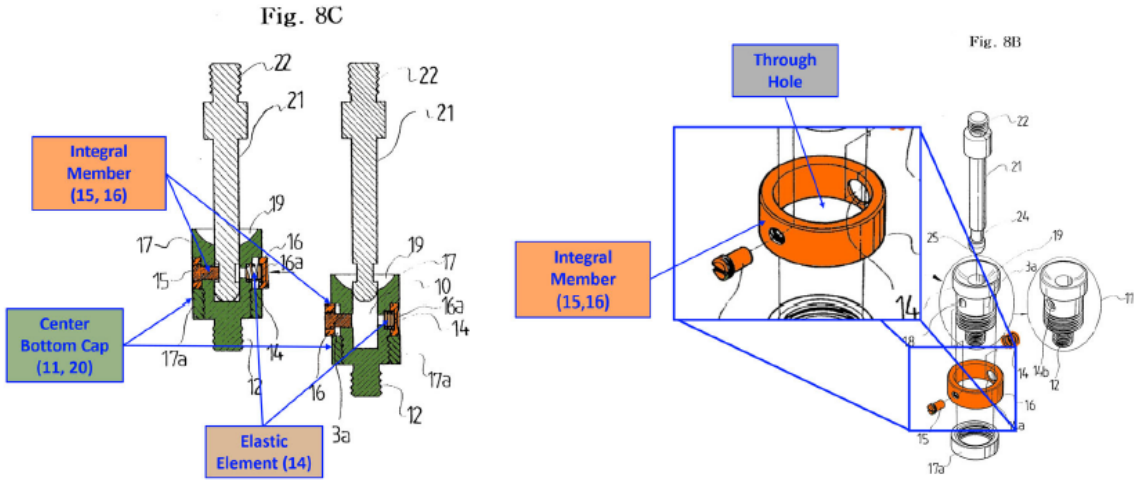


FIG. 2(A)

Petitioner asserts that ring 730 and pin 731 comprise an integral member at least because they are rigidly connected parts that form a whole. *Id.* (citing Ex. 1102 ¶21; Ex. 1103, 903; *Advanced Cardiovascular Sys., Inc. v. Scimed Life Sys., Inc.*, 887 F.2d 1070, 1071–74 (Fed. Cir. 1989) (declining to limit "integral" to "of one piece"); and other cases). Even if ring 730 and pin 731 are not an integral member, Petitioner asserts "it would have been obvious to a POSITA to form them as an integral member." *Id.* (citing Ex. 1102 ¶ 21; Ex. 1101, 202:9–203:5 (Dr. Bewley admitting "[i]t is possible" to form the ring and pin "out of a single piece")).

Regarding Chang, Petitioner also asserts a person of ordinary skill would have understood Chang's "operation hoop 16" with attached "connection screw 15" to comprise "an integral member having a through hole with a clamping hole part." *Id.* at 4–5. Petitioner provides the

following annotated Figures 8B (on the right) and 8C (on the left) to illustrate its argument.



Patent Owner asserts three differences between Rousselle and substitute claim 12:

(1) Rousselle does not disclose a "collapsible frame with external retractable units;"

(2) Rousselle's "spring (SP) and ring (730)" do not have "a clamping section because pin (731) is not part of the spring-loaded ring (730);" and

(3) Rousselle "has a pin that engages the clamping [groove] instead [of] its spring-loaded ring." Mot. Amend. 12–13 (citing Ex. 2033 ¶¶ 70–71).

For the first asserted difference, Petitioner does *not* rely on Rousselle for the "external retractable units." Petitioner relies on Tsai for this element in claim 8 and the corresponding element in substitute claim 12. Pet. 15–19 ("A POSITA would have been motivated to include Tsai's outer retractable units in Rousselle's canopy for several reasons." Ex. 1002 ¶¶ 70–76). Indeed, Patent Owner acknowledges that Tsai discloses this element. *See* Mot. Amend. 16 (chart answering "YES" to whether Tsai discloses claim limitation "B").

For the second and third asserted differences, Petitioner relies on Rousselle's "spring SP pushing the ring 730 rightward [which] causes 'pin 731 [to] extend[] through a lateral hole in the socket member 720 into a groove 712 in the center pin 710." Pet. 44 (citing Ex. 1005, 7:20–31, Fig. 2(A)). Petitioner explains that "Rousselle discloses a spring loaded locking piece (ring 730 and pin 731, as biased by spring SP) *that engages the clamping groove (groove 712)*. *Id.* at 44–45 (emphasis added, citing Ex. 1002 ¶ 132). Petitioner relies on Rousselle's annotated Figure 2(A) to illustrate this asserted structure, which is reproduced below.

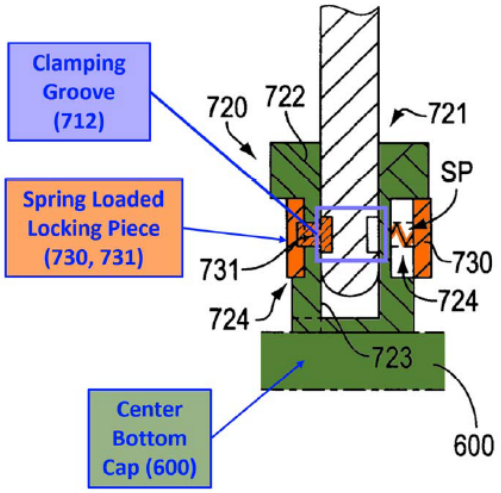


FIG. 2(A)

While Patent Owner may disagree with this argument and its supporting evidence, we give it credibility and determine that this evidence is substantial and outweighs the evidence to the contrary. In particular, Patent Owner places too much weight on the term "integral" in Patent Owner's formulation of the corresponding structure in the '710 patent. No doubt, in the first corresponding embodiment of the '710 patent, locking piece 4 is a one-piece structure. *See* Ex. 1001, Figs. 4 and 13. By contrast, Rouselle provides two rigidly connected pieces (ring 730 and pin 731) and

Chang provides two rigidly connected pieces (hoop 16 and screw 15). *See* Ex. 1005, Fig. 2A; Ex. 1006, Fig. 8B. Nonetheless, under Federal Circuit precedent, whether the claim term "integral" requires a one-piece construction is determined on a cases-by-case basis, based on the intrinsic evidence at issue. *See Advanced Cardiovascular*, 887 F.2d at 1071–74. Patent Owner proffers no claim construction analysis to suggest that the intrinsic evidence relating to the '710 patent indicates an integral member should be limited to a one-piece construction, and we discern none. Moreover, we conclude that even if the integral member of claim 12 must have a one-piece construction, the two-piece constructions of Rouselle and Chang are nonetheless "equivalents thereof" under 35 U.S.C. § 112(f) due to the rigid coupling between the two pieces.

Patent Owner also relies on the same "secondary" evidence of non-obviousness we have discussed above in the context of our analysis of claims 7–9, and 11. Mot. Amend. 17–24. We reach the same conclusion for the substitute claims as we reached for the original claims. This "secondary" evidence is *not* persuasive.

Accordingly, we determine claim 12 is unpatentable under § 103 based on Rousselle or Chang, and Tsai, substantially as set forth above in connection with Petitioner's grounds 1–3, and as supplemented here.

c) Substitute Claims 13 and 14

Petitioner asserts that "proposed" claim 13's additional limitations are disclosed by Rousselle and Chang. Mot. Amend. Opp. 7–11. Petitioner also asserts that "proposed" claim 14's additional limitations are disclosed by Rousselle, Chang, and/or Ohnishi. Mot. Amend. Opp. 11–20. Petitioner provides a clause-by-clause analysis of these claims, citing evidence to

support its assertions. Petitioner concludes that claims 13 and 14 would have been obvious based on these references.

"With respect to substitute claims 13 and 14, Patent Owner asserts "the CNIPA [the Chinese Patent Office] recently identified three differences between the claimed subject matter and Rousselle." Mot. Amend. 13–15. Patent Owner concludes, "[s]o, the substitute claims are different than the closest known art." *Id*. at 15. While we consider this evidence, it is not binding on us, and we give it minimal probative value. We find this minimal evidence far outweighed by the substantial contrary evidence we have discussed in this opinion.

In addition, claims 13 and 14 require the locking piece to be "disposed inside" (claim 13) or "received in" (claim 14) the center bottom cap. Patent Owner argues Rouselle falls short in this regard, because ring 730 and pin 731 are disposed outside of socket 720, rather than inside of socket 720. Mot. Amend. 13–14. Petitioner disagrees, "[b]ecause Rousselle's pin 731 extends through, and is thus disposed inside of, the socket 720, which is part of the center bottom cap." Mot. Amend. Opp. 7–8 (citing Ex. 1102 ¶ 50). We agree with Petitioner's position, and we additionally find that Rouselle's ring 730 is disposed and received in annular recess 724 of socket 720. *See* Ex. 1005, Fig. 2(A), 7:23–31. We discern nothing in claim 13 or claim 14 that requires the entirety of the locking piece to be disposed inside or received in the center bottom cap.

For claim 14, Patent Owner also asserts the claim "is different than Ohnishi" because Ohnishi discloses "a "foldable pushcart and foldable baby carriage" instead of a collapsible canopy. Mot. Amend. Reply 9. It is Patent Owner's position that, with respect to claim 8, "Ohnishi does not teach or

disclose elements Diii2," and with respect to claim 14, Ohnishi does not disclose "a locking mechanism wherein an upper end surface of the clamp locking part 'abuts against' a lower end surface of a locking piece." *Id*. at 9–10. Patent Owner also asserts that Chang, Rousselle and Tsai "do not disclose or teach elements D(iii)(1) and [E] of claims and 12-14." *Id.* at 10.

Patent Owner's arguments are not supported by any cited, probative evidence. Moreover, "[a] brief must make all arguments accessible to the judges, rather than ask them to play archeologist with the record." *DeSilva v. DiLeonardi*, 181 F.3d 865, 866–67 (7th Cir. 1999); *see also Novartis AG v. Torrent Pharms.*, 853 F.3d 1316, 1326 n.2 (Fed. Cir. 2017) (explaining that a party failed to provide sufficient argument in support of its motion before the Board because the motion's "superficial treatment amounts to little more than a request that the Board peruse the cited evidence and piece together a coherent argument on [the movant's] behalf").

Additionally, to the extent these arguments were raised against original claims 7–9 and 11, these arguments have already been addressed. As Petitioner points out, "Professor Stein's testimony shows that the substitution of Ohnishi's locking piece for Rousselle or Chang's locking piece would cause the resulting apparatus to operate on the same principles as before the modification." Mot. Amend. Sur-reply 7.

Patent Owner also relies on the same "secondary" evidence of non-obviousness we have discussed above in the context of our analysis of claims 7–9, and 11. Mot. Amend. 17–24. We reach the same conclusion for the substitute claims as we reached for the original claims. This "secondary" evidence is *not* persuasive.

Accordingly, we determine claim 13 is unpatentable under § 103 based on Rousselle or Chang, and Tsai. We also determine that claim 14 is unpatentable under § 103 based on Rousselle or Chang, combined with Tsai and Ohnishi, as asserted by Petitioner.

d) Conclusion Regarding Substitute Claims 12–14

Based on the evidence and the analysis above, we determine that substitute claims 12–14 are not patentable. Accordingly, we deny Patent Owner's Motion to Amend.

IV. MOTION TO SUBMIT SUPPLEMENTAL INFORMATION

Patent Owner filed a Motion to Submit Supplemental Information (Paper 21, "Mot. Suppl. Evid."), under 37 C.F.R. § 42.123(b), seeking to submit eight exhibits (Exs. 2037–2044) relating to proceedings from the Chinese Patent Office in a Chinese patent corresponding to the '710 patent in this IPR proceeding. Petitioner opposed the Motion (Paper 22). We grant the motion.

Under our Rule 123(b), the moving party the party must prove why the proffered information could not have been obtained earlier and that consideration of the information is in the interests-of-justice. "A party filing a motion has the burden of proof to establish that it is entitled to the requested relief." 37 C.F.R. § 42.20. Patent Owner asserts that the information "did not exist earlier than Jan. 18, 2022." Mot. Suppl. Evid, 1. Patent Owner also argues the motion is in the interest of justice. *Id.*

In this *inter partes* review, the better course is to have a complete record of the evidence to facilitate public access as well as appellate review. *Sony Computer Entm't Am. LLC v. Game Controller Tech. LLC*, IPR2013-00634, Paper 32 at 31 (PTAB Apr. 14, 2015); *see also Gnosis S.p.A. v. S.*

Alabama Med. Sci. Found., IPR2013-00118, Paper 64 at 43 (PTAB June 20, 2014) (citing *Donnelly Garment Co. v. NLRB*, 123 F.2d 215, 224 (8th Cir. 1941) ("If the record on review contains not only all evidence which was clearly admissible, but also all evidence of doubtful admissibility, the court which is called upon to review the case can usually make an end of it, whereas if evidence was excluded which that court regards as having been admissible, a new trial or rehearing cannot be avoided.")). Thus, we grant the motion to submit the supplemental evidence.

In *Donnelly* the Court stated, in the context of reviewing an administrative determination of the National Labor Relations Board based on findings by a Trial Examiner, "[w]e think that experience has demonstrated that in a trial or hearing where no jury is present, more time is ordinarily lost in listening to arguments as to the admissibility of evidence and in considering offers of proof than would be consumed in taking the evidence proffered . . . One who is capable of ruling accurately upon the admissibility of evidence is equally capable of sifting it accurately after it has been received . . . .". *Donnelly*, 123 F.2d at 224. Here, the Board, sitting as a non-jury tribunal with administrative expertise, is well positioned to determine and assign appropriate weight to evidence presented, including giving it no weight. We note we did not cite to any of the supplemental evidence in support of our analysis in this opinion.

V. CONCLUSION[19]

Petitioner has established by a preponderance of the evidence that claims 8, 9, and 10 are unpatentable under Grounds 1, 2, and 3. Petitioner has *not* established that claim 7 is unpatentable under Grounds 4 and 5.

Petitioner has established by a preponderance of the evidence that substitute claims 12, 13, and 14 are unpatentable. Accordingly, we deny the Motion to Amend.

We grant Patent Owners motion to submit supplemental evidence.[20]

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 8, 9, and 11 are unpatentable;

FURTHER ORDERED that Petitioner has not shown by a preponderance of the evidence that claim 7 is unpatentable;

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

FURTHER ORDERED that Patent Owner's Motion to Submit Supplemental Information is granted; and

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[19] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner'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 Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner 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).

[20] This evidence was submitted with the Motion and has been in our record since the motion was filed.

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.

In Summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
8, 9, 11	103	Rousselle and Tsai	8, 9, 11	
8, 9, 11	103	Chang and Tsai	8, 9, 11	
8, 9, 11	103	Tsai and Rousselle or Chang	8, 9, 11	
7	102(a)(1)	Ohnishi		7
7	103	Ohnishi		7
Overall Outcome			8, 9, 11	7

Motion to Amend Outcome	Claim(s)
Original Claims Cancelled	
Substitute Claims Proposed in the Amendment	12, 13, 14
Substitute Claims: Motion to Amend Granted	
Substitute Claims: Motion to Amend Denied	12, 13, 14
Substitute Claims: Not Reached	

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