

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SRAM, LLC,
Petitioner,

v.

FOX Factory, Inc.,
Patent Owner.

IPR2024-00216
Patent 8,550,223 B2

Before MEREDITH C. PETRAVICK, FRANCES L. IPPOLITO, and
BRENT M. DOUGAL, *Administrative Patent Judges*.

IPPOLITO, *Administrative Patent Judge*.

DECISION
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

SRAM, LLC (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting an *inter partes* review of claims 1–9, 11–15, and 19 of U.S. Patent No. 8,550,223 B2 (Ex. 1001, “the ’223 patent”). FOX Factory, Inc. (“Patent Owner”) filed a Preliminary Response (Paper 8, “Prelim. Resp.”).

Applying the standard set forth in 35 U.S.C. § 314(a), we instituted an *inter partes* review as to all claims and grounds set forth in the Petition. Paper 11 (“Inst. Dec.”).

After institution, Patent Owner filed a Patent Owner Response (Paper 15, “PO Resp.”), Petitioner filed a Reply (Paper 18, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 21, “PO Sur-reply”). An oral hearing was held for this proceeding on March 7, 2025, and the transcript is of record. Paper 32 (“Tr.”).

We have jurisdiction pursuant to 35 U.S.C. § 6. This Decision is a Final Written Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73 as to the patentability of the Challenged Claims. Petitioner bears the burden of proving unpatentability of the Challenged Claims. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must prove unpatentability by a preponderance of the evidence. *See* 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2021). Having reviewed the arguments and the supporting evidence, we determine that Petitioner has shown, by a preponderance of the evidence, that claims 1–9, 11–15, and 19 of the ’223 patent are unpatentable.

II. BACKGROUND

A. *Related Matters*

The parties indicate that the '223 patent has been asserted in the following United States District Court actions: *FOX Factory, Inc. v. SRAM, LLC*, C.A. No. 1:23-cv-00313-RM-KAS (D. Colo.) and *FOX Factory, Inc. v. SRAM, LLC*, C.A. No. 2:22-cv-04805-DOC-JC (C.D. Cal.) (transferred to D. Colo. February 1, 2023) (collectively referred to as “District of Colorado proceeding”). Pet. 117; Paper 4, 1. The District of Colorado proceeding was stayed on January 31, 2025 pending the outcome of this *inter partes* review. Paper 28 (“Petitioner’s Updated Mandatory Notices”).

B. *Real Parties in Interest*

Petitioner identifies itself as the real party-in-interest. Pet. 117. Patent Owner identifies itself and FOX Factory Holding Corp. as the real parties-in-interest. Paper 4, 1.

C. *The '223 Patent*

The '223 patent, titled “Methods and Apparatus for Position Sensitive Suspension Dampening,” relates generally to methods and apparatus for use in vehicle suspension, and more specifically to methods and apparatus useful for variable and position sensitive dampening rate in vehicle shock absorbers. Ex. 1001, code (54), 1:13–17.

Figure 2, reproduced below, depicts a section view of dampening assembly 200 of a shock absorber shown in an axially extended position. Ex. 1001, 3:23–25. Notably, the shock absorber spring is not shown.

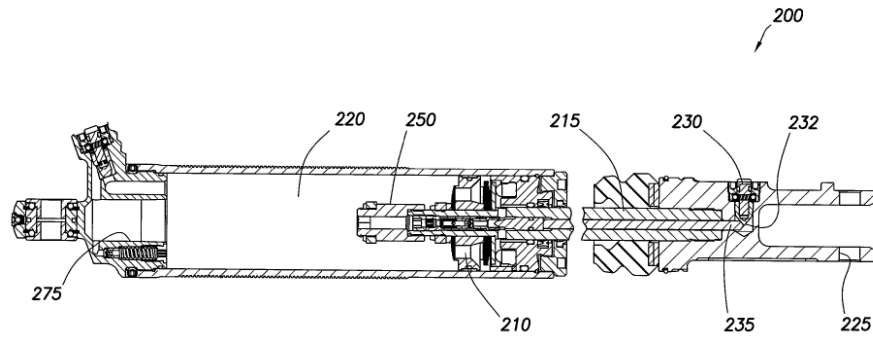


FIG.2

Dampening piston 210 is fixed relative to shaft 215, both of which are axially movable relative to housing or chamber 220. *Id.* at 3:25–27. Piston 210 is equipped with fluid paths therethrough to permit dampening fluid within chamber 220 to be metered through piston 210. *Id.* at 3:27–29. For example, when shaft 215 moves into chamber 220, fluid moves from a first side (the compression portion) to an opposite side (the rebound portion) of chamber 220 through the paths formed in piston 210. *Id.* at 3:29–33. Piston shaft 215 includes a fluid path formed in its interior and provides for fluid communication between bottom out cup 275 and rebound portion 221 of chamber 220 during the rebound stroke. *Id.* at 5:28–32.

Figure 3A, reproduced below, is a section view showing bottom out piston 250 entering bottom out cup 275 during a compression stroke of a shock absorber. Ex. 1001, 3:4–6. Figure 3B, also reproduced below, is a section view showing bottom out cup 275 of Figure 3A with bottom out piston 250 fully engaged and sealed therein. *Id.* at 3:7–9.

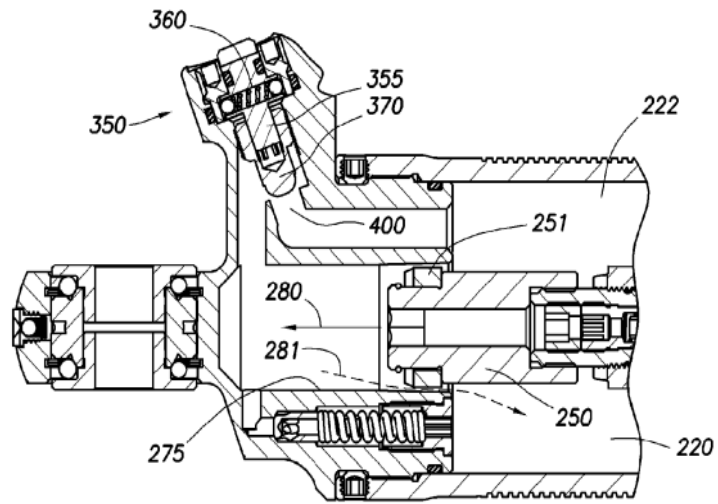


FIG. 3A

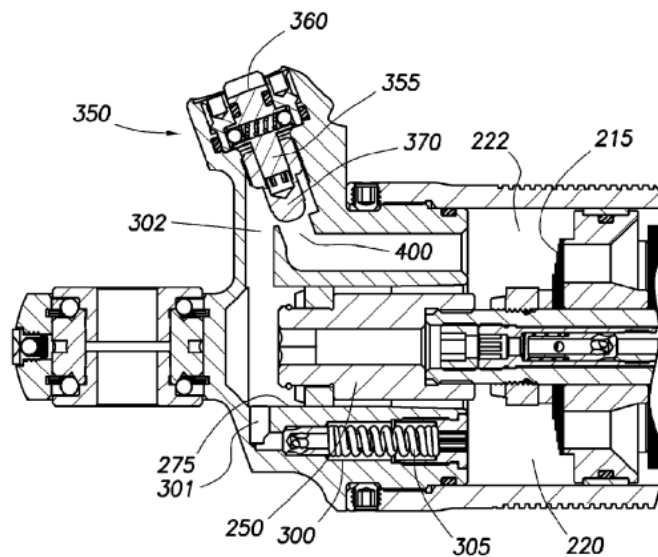


FIG. 3B

Bottom out piston 250 engages bottom out cup 275 formed at lower end of chamber 220. *Id.* at 3:41–43. User-adjustable metering valve 350 with externally accessible adjustment features is in communication with bottom out cup 275 and can be found at end of fluid flow path 302. *Id.* at 4:31–33. Bottom out piston 250 includes piston ring or dynamic seal 251 for axially slidable engagement with an inner diameter of bottom out cup 275. *Id.* at 3:51–54. As piston 250 completely engages with bottom out cup 275,

dampening can increase because shaft 215 can only progress further as fluid (e.g., substantially incompressible) is moved from bottom out cup 275 through one of two paths 301, 302 leading back into compression portion 222 of chamber 220. *Id.* at 3:64–4:2.

D. Challenged Claims

Petitioner challenges claims 1–9, 11–15, and 19. Pet. 1. Claims 1, 11, and 19 are independent claims. Claim 1 is reproduced below:

1. A damper for a shock absorber comprising:
 - a damper chamber divided by a piston and shaft into a compression and rebound portions;
 - a bottom out cup formed at an end of the compression portion;
 - and
 - a fluid flow path formed in the bottom out cup for providing fluid communication from the cup to the compression portion of the chamber during a compression stroke of the damper; wherein the capacity of the fluid flow path is adjustable.

Ex. 1001, 7:39–48.

Claim 11 is reproduced below:

11. A fluid damper comprising:
 - a damper chamber divided by a piston mounted on a movable rod, into a primary compression and a primary rebound chamber;
 - a bottom out cup in fluid communication with the damper chamber;
 - a bottom out piston formed on the movable rod for sealingly engaging an interior of the bottom out cup, the damper including a first position in which the bottom out piston is not housed in the bottom out cup and a second position in which the bottom out piston is housed therein; and
 - an adjustable fluid flow path formed in the cup, the flow path providing fluid communication between the cup and the

primary compression chamber in a compression stroke of the damper.

Ex. 1001, 8:8–23.

Claim 19 is reproduced below:

19. A damper for a shock absorber comprising:

a fluid;

a compression chamber;

a bottom out cup;

a valve wherein;

in a compression stroke of the damper, the fluid flows from the bottom out cup to the compression chamber at a first rate with the valve in a first position and at a second rate with the valve in a second position where the first rate is greater than the second rate and the valve includes an adjuster accessible from an exterior of the shock absorber.

Ex. 1001, 8:61–9:5.

E. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–9, 11–15, and 19 would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–9, 11–15, 19	102	Nakaya ¹
4, 8 ²	103	Nakaya, Kodama ³

¹ U.S. Patent No. 6,558,430 B1, issued May 6, 2003 (Ex. 1005) (“Nakaya”).

² Petition includes Kodama in this challenge on pages 37–39. Pet. 37–39.

³ U.S. Patent No. 5,405,407, issued April 11, 1995 (Ex. 1006) (“Kodama”).

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–5, 9, 11–15, 19 ⁴	102	Chen ⁵
1–5, 9, 11–15, 19	103	Chen alone or with Deferme ⁶ , Kodama ⁷
1–5, 9, 11–15, 19	103	Fox ’751, ⁸ Chen, Kodama ⁹
5–9	103	Fox ’751, Chen, Nakaya, Kodama
1–5, 9, 19	102	Gartner ¹⁰
4	103	Gartner, Kodama

Pet. 3–4. Petitioner also relies on the Declarations of Eric Wang, Ph.D. (Exs. 1002, 1019) and Kevin Wesling (Ex. 1003). Patent Owner relies on the declarations of Alexander Slocum, Ph.D. (Exs. 2007, 2010).

III. ANALYSIS

A. Level of Ordinary Skill in the Art

In determining the level of skill in the art, we consider the type of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the

⁴ The listing of grounds on page 3 indicates claims 1–5, 9, 11–15, and 19 are challenged. Pet. 3. The heading on page 52 lists claims 1–9, 11–15, and 19 as challenged. Pet. 52. The Petition substantively addresses claims 1–5, 9, 11–15, and 19 on pages 56–78. For clarity, we treat the heading on page 52 as a typographical error.

⁵ UK Patent Application No. GB2377254A, published August 1, 2003 (Ex. 1007) (“Chen”).

⁶ U.S. Patent Application Publication No. 2006/0283676 A1, published Dec. 21, 2006 (Ex. 1008) (“Deferme”).

⁷ Petition includes Kodama in this challenge on page 65. Pet. 65.

⁸ U.S. Patent No. 6,604,751 B2, issued Aug. 12, 2003 (Ex. 1009) (“Fox ’751”).

⁹ Petition includes Kodama in this challenge on p. 85. Pet. 85 (claim 4).

¹⁰ U.S. Patent No. 8,162,112 B2, issued Apr. 24, 2012 (Ex. 1010) (“Gartner”).

technology, and the educational level of active workers in the field. *Custom Accessories, Inc. v. Jeffrey-Allan Indus. Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *Orthopedic Equip. Co. v. U.S.*, 702 F.2d 1005, 1011 (Fed. Cir. 1983).

Petitioner contends that a person of ordinary skill in the art (“POSITA”) at the time of the invention of the ’223 patent “would have a degree in Mechanical Engineering and at least three years’ experience in vehicle suspension technology, or a Master’s degree in Mechanical Engineering with a concentration in design of vehicle suspension technology and/or shock absorbers.” Pet. 5–6, n.1. Patent Owner does not contest Petitioner’s proposed level of ordinary skill in the art. *See* PO Resp.

Based on the complete record, we adopt Petitioner’s proposal as reasonable and consistent with the prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art may reflect an appropriate level of skill in the art).

B. Principles of Law

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831 (Fed. Cir. 1990).

In *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966), the Supreme Court set out a framework for assessing obviousness under § 103 that requires consideration of four factors: (1) the “level of ordinary skill in the pertinent art,” (2) the “scope and content of the prior art,” (3) the “differences between the prior art and the claims at issue,” and (4)

“secondary considerations” of non-obviousness such as “commercial success, long-felt but unsolved needs, failure of others, etc.” *Id.* at 17–18. “While the sequence of these questions might be reordered in any particular case,” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 407 (2007), the Federal Circuit has “repeatedly emphasized that an obviousness inquiry requires examination of all four Graham factors and that an obviousness determination can be made only after consideration of each factor.” *Nike, Inc. v. Adidas AG*, 812 F.3d 1326, 1335 (Fed. Cir. 2016).

We note that, with respect to the fourth *Graham* factor, the current record in this proceeding does not include any argument or evidence directed to secondary considerations of nonobviousness. The analysis below addresses the first three *Graham* factors.

C. Claim Construction

In an *inter partes* review proceeding, the Board interprets claim language using the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), as described in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). See 37 C.F.R. § 42.100(b). Under the principles set forth by our reviewing court, the “words of a claim ‘are generally given their ordinary and customary meaning,’” as would be understood by a person of ordinary skill in the art in question at the time of the invention. *Phillips*, 415 F.3d at 1312. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). Extrinsic evidence, when available, may also be useful when construing claim terms under this standard, extrinsic evidence should be

considered in the context of the intrinsic evidence. *See Phillips*, 415 F.3d at 1317–19.

1. “a bottom out cup”/ “a bottom out cup at the end of the compression portion” (claims 1, 11, 19)

Prior to institution, Patent Owner contended that the claim phrase “a bottom out cup at the end of the compression portion,” recited in independent claim 1, should be construed to mean “a *secondary* chamber at the *lower* end of the compression portion of the damper chamber and *configured to receive a secondary piston at the end portion of a compression stroke.*” Prelim. Resp. 7 (emphases added).

With respect to “a bottom out cup” recited in claims 11 and 19, Patent Owner proposed this term to mean “a *secondary* chamber at the *lower* end of the [*primary*] compression chamber of the damper chamber and *configured to receive a secondary piston* at the end portion of a compression stroke.” *Id.* (emphases added and brackets in original).

In the Decision on Institution, we declined to construe the recited “bottom out cup” to require a specific location of the damper chamber or to import the limitations: a secondary chamber, a secondary piston, or “generates secondary compression forces.” Inst. Dec. 14. Instead, we preliminarily construed “bottom out cup” as a “cup-shaped feature configured for providing dampening.” *Id.* We noted that our construction was consistent with the disclosure of the ’223 patent, which teaches that “[w]hat is needed is a *dampening system* that will prevent or mitigate *bottom out* and that can be adjusted as a ride, and corresponding use of the shock absorber, progresses.” Ex. 1001, 2:28–31 (emphases added).

In the Patent Owner’s Response, Patent Owner maintains its previously proposed construction of “bottom out cup” as “a secondary

chamber at the lower end of the compression portion of the damper chamber and configured to receive a secondary piston at the end portion of a compression stroke.” PO Resp. 8–9 (citing Ex. 2010 ¶¶ 35–36). Patent Owner asserts, however, that “[t]he claim construction of ‘bottom out cup’ is not pertinent to the disputes related to Grounds I–IV; it is only relevant for Ground V.” *Id.* at 9 n.2. Specifically, Patent Owner contends that

the Board’s construction of “bottom out cup” as a “cup-shaped feature configured for providing dampening” may be sufficient to resolve the disputes related to Ground V (alleged unpatentability based on . . . [Gartner]) *if the construction is clarified to state that the “bottom out cup” provides “dampening only at the end portion of a compression stroke.”*

Id. (citing Ex. 2010 ¶ 37) (emphases added). Patent Owner argues “[t]his clarification is needed to distinguish between any cup-shaped damper chamber and the ‘bottom out cup’ whose purpose is to increase dampening in the final stages of a shock absorber’s compression stroke.” PO Resp. 9 (citing Ex. 2010 ¶ 37; Ex. 1001, 1:65–2:9, 2:22–26). Patent Owner contends Petitioner’s experts agree that the “bottom out cup” technology provides dampening near the end of a compression stroke. *Id.* at 9–10 (citing Ex. 2011, 18:18–22:12; Ex. 2012, 15:6–16:19).

Based on the complete record, we do not adopt Patent Owner’s proposed constructions in their entirety, but modify our prior construction to include “at the end of a compression stroke.” To start, claim 1 expressly recites:

A damper for a shock absorber comprising:
a damper chamber divided by a piston and shaft into a
compression and rebound portions;
*a bottom out cup formed at an end of the compression
portion; and*

a fluid flow path formed in the bottom out cup for providing fluid communication from the cup to the compression portion of the chamber during a compression stroke of the damper; wherein the capacity of the fluid flow path is adjustable.

Ex. 1001, 7:39–48 (emphasis added). We note that the express language of claim 1 recites a “damper chamber,” but does not recite “a secondary piston,” “a secondary chamber,” or “a secondary chamber at the lower end of the compression portion of the damper chamber.” Claim 1 expressly recites that the “bottom out cup” is at “*an end* of the compression portion” of the damper chamber, but does not require that end to be a *lower* end.

Similarly, independent claim 19 recites “a bottom out cup,” but does not recite that the bottom out cup includes a secondary chamber, a secondary piston, or that the bottom out cup is located at any end of any compression portion. Ex. 1001, 8:64.

Independent claim 11, reproduced below, recites:

a bottom out cup in fluid communication with the damper chamber;

a bottom out piston formed on the movable rod for sealingly engaging an interior of the bottom out cup, the damper including a first position in which the bottom out piston is not housed in the bottom out cup and a second position in which the bottom out piston is housed therein[.]

Ex. 1001, 8:12–19. Claim 11 recites “a bottom out cup in fluid communication with the damper chamber” but does not require the bottom out cup to be at a lower end of a compression chamber. We observe that claim 11 recites “a bottom out piston” for “sealingly engaging an interior of the bottom out cup.” However, the “bottom out piston” is recited separately from the “bottom out cup,” whereas Patent Owner’s proposed construction

introduces a “secondary piston” into the construction of the “bottom out cup.”

Further, the disclosure of the ’223 patent does not support Patent Owner’s proposed construction. For example, column 3 of the ’223 patent discloses a bottom out piston “constructed and arranged to engage a bottom out cup 275 formed at the *lower end* of the chamber 220.” Ex. 1001, 3:42–44. The disclosure in column 3 expressly describes the bottom out cup as located at a lower end of chamber 220. Elsewhere, the Abstract describes “a secondary compression chamber in fluid communication with the damper chamber.” Ex. 1001, code (57). This disclosure is consistent with the language of claims 1, 11, and 19 that does not require the secondary compression chamber to be at the lower end of the chamber. *Id.* Further, we note once more that the “bottom out piston” as described is a separate component that is not included in the “bottom out cup.” *See* Ex. 1001, 3:42–44.

Patent Owner’s declarant, Dr. Slocum, testifies that the ’223 patent uses the term “bottom out cup” and “secondary dampening mechanism” or “secondary compression chamber” interchangeably. Ex. 2010 ¶ 36 (citing Ex. 1001, Abstract, 2:22–35, 2:43–51, 3:1–3). Dr. Slocum further contends that “it is implicit that the ‘bottom out cup’ is configured to receive a bottom out piston, i.e., a secondary piston that is distinct from the main dampening piston, and that the bottom out piston generates secondary compression forces within the ‘bottom out cup.’” *Id.* (citing Ex. 1001, 2:45–55).

Nonetheless, Patent Owner’s and Dr. Slocum’s proposal incorporates these features and structures, “secondary” chamber/mechanism, secondary piston, or bottom out piston, implicitly (and explicitly) into the “bottom out cup,” even where these terms are recited separately, e.g., claim 11. We find

that this approach improperly imports limitations into the term “bottom out cup” and renders other portions of the claim language superfluous.

Generally, constructions that do so are disfavored. *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 801, 809–810 (Fed. Cir. 2021)); *Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1049 (Fed. Cir. 2019).

With regard to Patent Owner’s alternative claim construction for “Ground V” challenge based on Gartner, we modify our prior construction for the reasons below.

Here, we understand Patent Owner’s point to be that a bottom out cup provides dampening that is different from a “conventional damper chamber.” PO Resp. 10 (citing Ex. 2010 ¶ 38); *see also* PO Sur-reply 3. Patent Owner contends that a bottom out cup provides “dampening functionality only near the end of the compression stroke and clarifies that it is not just any cup-shaped feature.” *Id.*; PO Sur-reply 3 (“[T]he Board’s preliminary construction should be modified to state that the ‘bottom out cup’ provides dampening only in the final stages of a shock absorber’s compression stroke (not throughout the compression stroke).”).

Dr. Slocum further testifies that “the whole patent is about what happens at the end of stroke when the secondary piston enters the cup. Until that point, the cup is not doing anything, so it doesn’t really mean anything.” Ex. 1020, 47:15–19; *see also* Ex. 2010 ¶ 38 (“SRAM’s interpretation of ‘bottom out cup’ as simply ‘a cup-shaped feature’ is neither helpful to the resolution of the prior-art disputes between the parties, nor is it technically correct because it eliminates the dampening functionality of the bottom out cup and demotes it to any cup-shaped component regardless of any dampening function.”).

Petitioner responds that the '223 patent's written description does not limit the "bottom out cup" to "providing dampening only at the end portion of a compression stroke" and that "nearly every embodiment provides some amount of damping whenever the shock absorber 100 is compressing, with no specific limitation as to only providing damping at the end portion of the compression stroke." Pet. Reply 4 (footnote omitted). Petitioner further notes that claim 17, not challenged in this proceeding, expressly recites a second piston "for moving into sealing engagement with a bottom out cup *at an end of a compression stroke of the shock absorber.*" *Id.* (emphasis omitted).

As Petitioner discerns, claim 1 does not recite "dampening only at the end portion of a compression stroke." Rather, claim 1 expressly requires "a fluid flow path formed in the bottom out cup for providing fluid communication from the cup to the compression portion of the chamber *during a compression stroke of the damper[.]*" Ex. 1001, 7:44–47 (emphasis added). In this way, claim 1 contemplates that the bottom out cup operates "*during a compression stroke of the damper,*" rather than *only* at the end portion of a compression stroke or *only near* an end of a compression stroke.

Similarly, independent claims 11 and 19 do not require that the bottom out cup provide damping *only* at the end or near the end of a compression stroke. *See* Ex. 1001, 8:8–23, 8:61–9:5. Claim 11 recites "a bottom out cup in fluid communication with the damper chamber" and "an adjustable fluid flow path formed in the cup, the flow path providing fluid communication between the cup and the primary compression chamber *in a compression stroke of the damper.*" *Id.* (emphasis added). Claim 19 also recites "in a compression stroke of the damper" and does not limit damping to the end, or near the end of a compression stroke. *See id.* at 8:61–9:5 ("*in*

a compression stroke of the damper, the fluid flows from the bottom out cup to the compression chamber at a first rate with the valve in a first position and at a second rate with the valve in a second position where the first rate is greater than the second rate and the valve includes an adjuster accessible from an exterior of the shock absorber.”) (emphasis added).

The ’223 patent as a whole also does not describe the bottom out cup as damping or providing dampening *only* at the end or near the end of the compression stroke, but more broadly as *during* the compression stroke. With reference to Figure 3A, the ’223 patent discloses that bottom out piston 250 enters “the bottom out cup 275 *during a compression stroke of the shock absorber.*” Ex. 1001, 3:38–50 (emphasis added). Additionally, we observe that the ’223 patent discloses “[a]s the piston completely engages the cup 275, *dampening is increased.*” *Id.* at 3:64–65 (emphasis added). We understand this to mean that bottom out dampening occurs at the end of the compression stroke, but may also occur “during” the compression stroke and “increase” as the piston completely engages the bottom out cup.

Our understanding of the claim language is further supported and consistent with a comparison of claims 1, 11, and 19 with unchallenged claim 17. Claim 17 recites “a second piston formed at an end of the shaft for moving into sealing engagement with a bottom out cup *at an end of a compression stroke* of the shock absorber.” Ex. 1001, 8:47–49 (emphasis added). That language, as discussed above, is not recited in claims 1, 11, and 19, but indicates the phrase “an end of a compression stroke,” could have been but was not included in independent claims 1, 11, and 19. Nevertheless, claim 17 does not require that the bottom out cup operate *only* at the end of a compression stroke. As discussed above, the bottom out cup

may provide damping *during or in* a compression stroke in addition to at the end of a compression stroke.

Our view is further supported by the cross-examination testimony of Dr. Wang and Mr. Wesling. Ex. 2011, 18:18–22:16; Ex. 2012, 16:3–19. For example, during cross-examination, Mr. Wesling agreed with Patent Owner’s counsel that a bottom out cup holds a separate volume of fluid “so that the shock absorber is able to provide dampening at the end portion of a compression stroke[.]” Ex. 2011, 21:21–22:3. Likewise, Dr. Wang’s cross-examination does the same. An exchange between Dr. Wang and Patent Owner’s counsel during cross-examination is provided below:

Q. I think so. I just wanted to clarify that the increased dampening that is provided by the bottom out cut, is provided near the end portion of a compression stroke. Would you agree with that?

A. The bottom out cups in general are *activated towards the end of a – the compression stroke*, so that's the damping is at the end of the -- near the bottom out event. You know, what that means, is a 10 percent, a 50 percent. That’s a variable, *but toward the end of the stroke -- of the compression stroke, that bottom out cup becomes active* and they have included adjustable damping into that bottom out cup, *which is active at the end of the compression stroke, near the bottom out event.*

Ex. 2012, 16:3–19 (emphases added).

We discern that the Specification, claim language, and expert testimony of record supports a modified construction of the claim term “bottom out cup” to mean a “cup-shaped feature configured for providing dampening *at the end of a compression stroke.*” We modify our construction in this way, but decline to adopt Patent Owner’s proposed

construction that the bottom out cup provides dampening *only* at the end of a compression stroke.

2. *“a fluid flow path formed in the bottom out cup for providing fluid communication from the cup to the compression portion of the chamber during a compression stroke of the damper” (claim 1)*

Claim 1 recites “a fluid flow path formed in the bottom out cup for providing fluid communication from the cup to the compression portion of the chamber during a compression stroke of the damper[.]” Ex. 1001, 7:44–47.

According to Petitioner, claim 1 requires a fluid communication “bridge” between a bottom out cup and a compression portion. Pet. Reply 6 (citing Ex. 1002 ¶¶ 44, 93); Pet. 16–17, 32 n. 2. Petitioner contends that this limitation does not require the fluid to flow in a specific direction, but that “fluid communication” is more like a bridge that extends from one point to another. Pet. Reply 6.

In response, Patent Owner contends that a POSITA would understand “fluid communication from the cup to the compression portion of the chamber” to mean that fluid flows from the cup to the compression portion during a compression stroke. PO Resp. 12 (citing Ex. 1001, 3:62–4:2; Ex. 2010 ¶ 41). Patent Owner further argues “that fluid communication from the bottom out cup to the compression portion of the chamber requires some fluid to flow from the cup to the compression portion.” *Id.* at 11 (citing Ex. 2010 ¶ 40) (emphasis omitted). Patent Owner contends that “[i]f there is fluid flow in only the opposite direction, i.e., from the compression portion of the chamber to the cup (and no fluid flow the other way around), then there is no ‘fluid communication from the cup to the compression portion of the chamber’ as required by claim 1.” *Id.* Patent Owner asserts that

Petitioner's interpretation reads the words "from" and "to" out of the claims and improperly inserts the word "between" there (as in claim 11). *Id.*

We agree with Petitioner. Claim 1 recites a "fluid flow path . . . for *providing* fluid communication." This *fluid flow path* is not limited to any specific fluid flow direction, but requires that the fluid flow path *provides* for *fluid communication* from the bottom out cup to the compression portion of the chamber. In other words, claim 1 requires structure that allows for fluid communication, but does not limit the actual fluid flow to a specific direction. We see no reason why "providing fluid communication" would require fluid flow.

We recognize that the claim states that the fluid communication is "from the cup to the compression portion." However, we disagree that "providing fluid communication" in this context requires a particular direction of fluid flow as argued by Patent Owner.

For comparison, claim 19 recites

in a compression stroke of the damper, *the fluid flows* from the bottom out cup to the compression chamber at a first rate with the valve in a first position and at a second rate with the valve in a second position where the first rate is greater than the second rate and the valve includes an adjuster accessible from an exterior of the shock absorber.

Id. at 8:66–9:5 (emphasis added). Here, claim 19 expressly requires the *fluid* to flow from the bottom out cup to the compression chamber. This language is distinct and distinguishable from that recited in claim 1, which does not dictate the direction of the actual fluid flow, only that the fluid flow path provides fluid communication for that direction, i.e., fluid may flow in that direction.

The '223 patent's disclosure is consistent and supports our understanding of the claim language. The '223 patent describes fluid movement from the bottom out cup through one of two paths 301, 302 leading back into the compression portion 222 of chamber 220. Ex. 1001, 3:64–4:2. With regard to path 302, the '223 discloses that

at an end of *fluid flow path* 302 is a user-adjustable metering valve 350 with externally accessible adjustment features. The valve 350 is operable provide an easily and readily adjustable dampening feature operable with the bottom out chamber 275 and piston 250. In FIGS. 3A-B *the valve 350 is shown in an open position whereby fluid may flow through an orifice 400. In FIG. 3C, the valve is shown in a closed position wherein orifice 400 is fully obstructed.*

Ex. 1001, 4:31–39 (emphases added). In this manner, the '223 patent explains that the disclosed fluid flow path structures may permit or restrict fluid flow, even blocking fluid movement entirely, when closed. *Id.* We understand the '223 patent discloses fluid flow paths designed to allow *fluid communication* from the cup to the compression chamber, but this disclosure does not require that the actual flow of the fluid occur a certain direction or way in the fluid flow path. For example, when the valve is closed, the actual fluid flow in fluid flow path 302 does not occur, but fluid flow path 302 provides fluid communication because that path may be opened.

Patent Owner contends that Petitioner improperly seeks to construe claim 1's "from" and "to" as "between," which is recited in claim 11. PO Resp. 11.

We need not decide that the terms "from" and "to" are equivalent or the same as "between." In this situation, the claims speak for themselves. Claim 1 recites that the "fluid flow path" provides a fluid communication from the bottom out cup to the compression portion of the chamber. We

understand this to mean claim 1 requires structural features that allow for the fluid communication *from* the bottom out cup *to* the compression portion of the chamber. Whether the same is required of claim 11's recitation of "between" is not currently an issue we must resolve. The parties do not dispute the construction of claim 11.¹¹

Consequently, we find that the ordinary and customary meaning of the claim phrase "a fluid flow path formed in the bottom out cup for providing fluid communication from the cup to the compression portion of the chamber during a compression stroke of the damper" requires structure that allows a fluid flow path to provide fluid communication from the bottom out cup to a compression portion of a chamber, without limiting actual fluid flow to a particular direction.

3. *Remaining Terms*

We discern further construction of these claim phrases or others is not required for the purposes of this Decision. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to construe 'only those terms that . . . are in controversy, and only to the extent

¹¹ We understand the parties to agree that independent claim 11 does not require fluid flow directionality. *See* PO Resp. 11 ("While it is correct that claim 11, which recites 'fluid communication between the cup and the primary compression chamber,' does not provide a direction of the fluid flow between the cup and the compression chamber, claim 1 requires 'fluid communication from the cup to the compression portion of the chamber.'" (emphasis omitted)). Further, the parties agree that claim 19 requires fluid flow directionality. *See* Pet. Reply 6 ("[I]ndependent claim 19 specifically identifies the direction of fluid flow: 'in a compression stroke of the damper, the fluid flows from the bottom out cup to the compression chamber[.]'" (second alteration in original)). As such, the construction of these limitations recited in claims 11 and 19 are not in dispute.

necessary to resolve the controversy.”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

D. Claims 1–5, 9, and 19 Anticipated by Gartner or Obvious over Gartner with Kodama

Petitioner asserts independent claims 1 and 19 and dependent claims 2–5, and 9 are anticipated by Gartner, and claim 4 would have also been obvious over Gartner in view of Kodama. Pet. 3–4, 105–116.

1. Gartner (Ex. 1010)

Gartner is a U.S. patent titled “Methods and Apparatus for Protecting a Shock Absorber from Bottoming.” Ex. 1010, code (54). Gartner relates to “shock absorbers having multiple flowpaths for the constrained flow of hydraulic fluid during compression of a vehicle suspension.” *Id.* at 1:37–40.

Figure 6 of Gartner, reproduced below, is a cutaway perspective view of a shock absorber. Ex. 1010, 2:30.

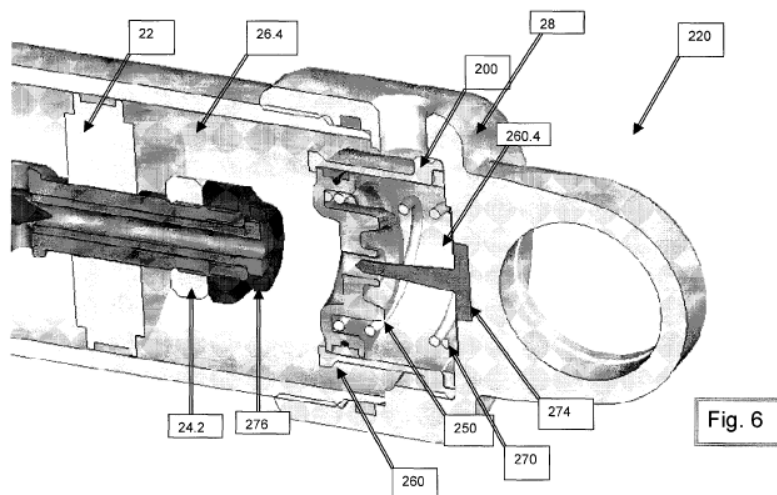


Figure 6 depicts shock absorber 220 that includes second, internal shock absorber 200. *Id.* at 7:11–13. Internal shock 200 includes cylinder 260 that is coupled to internal compression end 28 of shock 220. *Id.* at 7:14–16. Retaining lip 262 of cylinder 260 captures piston 250 therein and spring 270

biases piston 250 away from end 28 to create internal compression volume 260.4. *Id.* at 7:18–20. Shock 220 includes metering needle 274 having a tip and shaft extending through volume 260.4. *Id.* at 7:23–24. Piston 250 is slidable within the inner diameter of cylinder 260. *Id.* at 7:30–31.

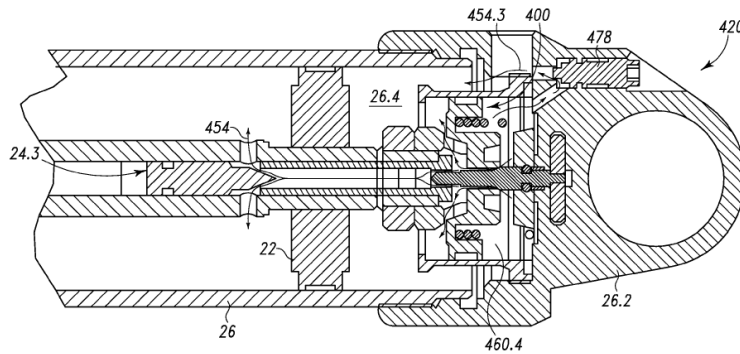
Additionally, piston 250 includes central orifice 255 which is adapted and configured to receive within it the tip and shaft of needle 274. *Id.* at 7:28–30. Piston 250 may include a pocket adapted and configured to receive ram 276. *Id.* at 7:40–41.

Gartner discloses that “during the initial portion of the compression stroke, the damping forces of shock absorber 220 are provided by a main compression flowpath 32” and “second shock absorber 200 is inactive, and does not provide any damping force.” *Id.* at 7:49–51, 7:55–56. “As the vehicle suspension continues to compress, ram 276 of rod 24 comes into contact with the complimentary-shaped pocket of piston 250.” *Id.* at 7:58–60. Gartner further provides that

[a]s shock absorber 220 continues in the compression stroke, ram 276 pushes piston 250 relative to cylinder 260. This relative motion results in a reduction in compression volume 260.4, and hydraulic fluid 20.1 flows through an annular orifice formed between the outer surface of needle 274 and the central passage 255 of piston 250.

Id. at 7:62–67.

Figure 12A of Gartner, reproduced below, is a cutaway side view of shock absorber 420.



Shock absorber 420 is the same as shock absorber 220, as described in Figure 6, but includes, among other things, means for externally adjusting the second flow path. *Id.* at 9:20–24. Shock absorber 420 includes one or more features for externally adjusting the damping characteristics of second internal shock absorber 400. *Id.* at 9:25–27. Auxiliary path 454.3 includes a first passageway in end cap 26.2 interconnecting compression volume 460.4 with adjustment screw 478. *Id.* at 9:35–37. The external end of screw 478 is sealed from the fluid environment, and includes an adjustment feature such as an internal hex head or external hex head. *Id.* at 9:37–40. The other end of screw 478 is in fluid communication with the first passageway previously described, and also with a second passageway that is in fluid communication with compression volume 26.4. *Id.* at 9:40–43. Screw 478 is threadably received within end cap 26.2. *Id.* at 9:43–44. As the screw is turned along the threads, a nose of screw 478 projects more or less into the second flow passage, and thereby forms more or less of a restriction to flow. *Id.* at 9:45–47. Adjustment of screw 478 results in a fixed-characteristic fluid bypass. *Id.* at 9:47–48. Gartner also discloses that “[f]luid from compression volume 160.4 flows through one or more orifices or passageways 154.1 in piston 150.” *Id.* at 6:2–3. One flowpath for hydraulic

fluid is through central passage 550.1, through central orifice 555, and into internal passage 24.1 of rod 24.

2. *Kodama (Ex. 1006)*

Kodama is a U.S. patent titled “Cylinder for Artificial Leg.” Ex. 1006, code (54). Kodama relates to a cylinder used in an artificial leg for a person having an upper thigh cut and an upper thigh stub. *Id.* at 1:5–7. Figure 2 of Kodama, reproduced below, is a longitudinal sectional view showing the “stretched” state of the prior art cylinder. *Id.* at 3:55–57.

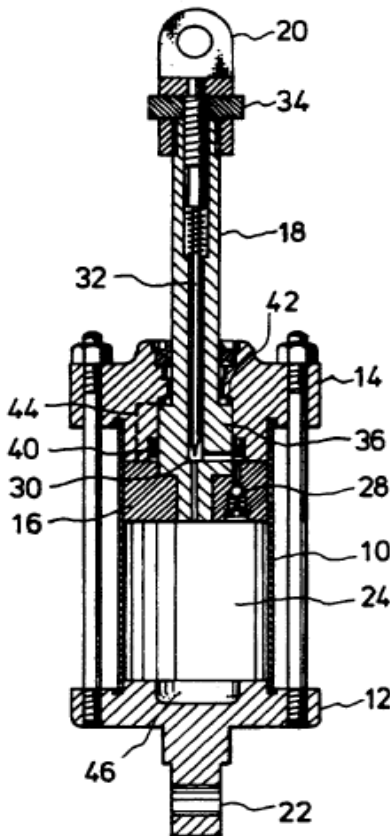
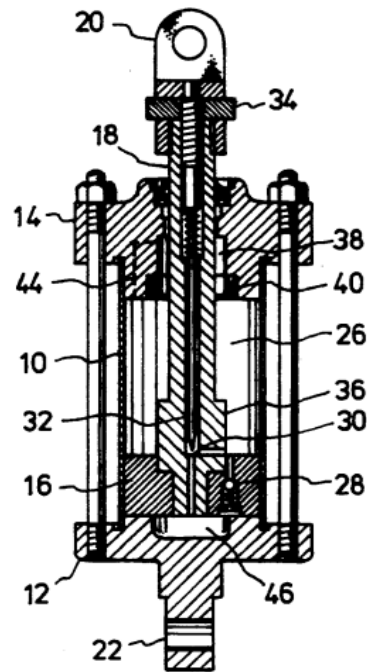


Figure 3, also reproduced below, is a longitudinal sectional view showing the “contracted” state of the cylinder of Figure 2. *Id.* at 3:58–59.



Kodama discloses that within the cylinder, piston 16 partitions the inner cavity of sleeve 10 into head chamber 24 adjacent to head cover 12 and rod chamber 26 adjacent to rod cover 14. *Id.* at 1:34–36. Piston rod 18 taught in Kodama includes throttle valve 30 having needle valve body 32 and also connects head chamber 24 to rod chamber 26. *Id.* at 1:48–51. Valve body 32 can be moved forward and backward by adjusting screw 34 to change the aperture of throttle valve 30. *Id.* at 1:51–53. Kodama also teaches that by adjusting throttle valve 30, the contracting resistance of the cylinder can be adjusted. *Id.* at 1:54–56.

3. Discussion

Petitioner asserts that independent claims 1 and 19, and dependent claims 2–5 and 9 are anticipated by Gartner. Pet. 105–116.

Patent Owner contends that this challenge fails because Gartner does not disclose a “bottom out cup.” PO Resp. 58–60; PO Sur-reply 21–24.

a) *Claim 19*

(1) *Petitioner's Contentions*

Petitioner generally contends Gartner discloses a damper for shock absorber 420 with a bottom out cup 260, 460 formed at the end of compression portion 26.4. Pet. 108–109 (citing Ex. 1010, Fig. 12A; Ex. 1002 ¶ 179; Ex. 1003 ¶ 174). Reproduced below is Petitioner's annotated version of Gartner Figure 12A:

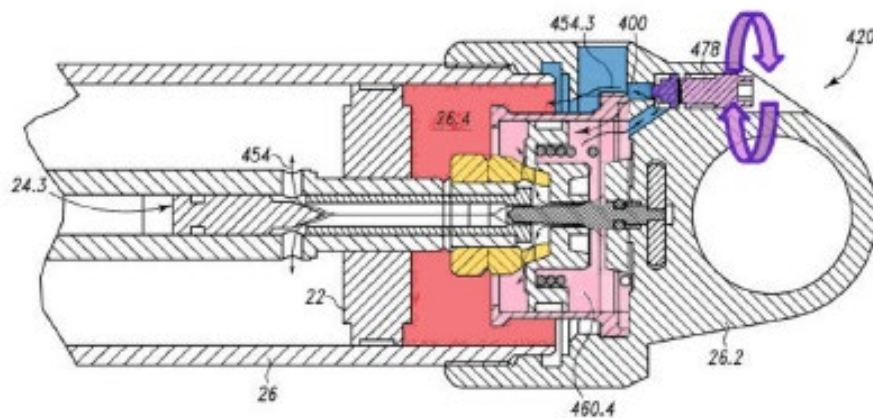
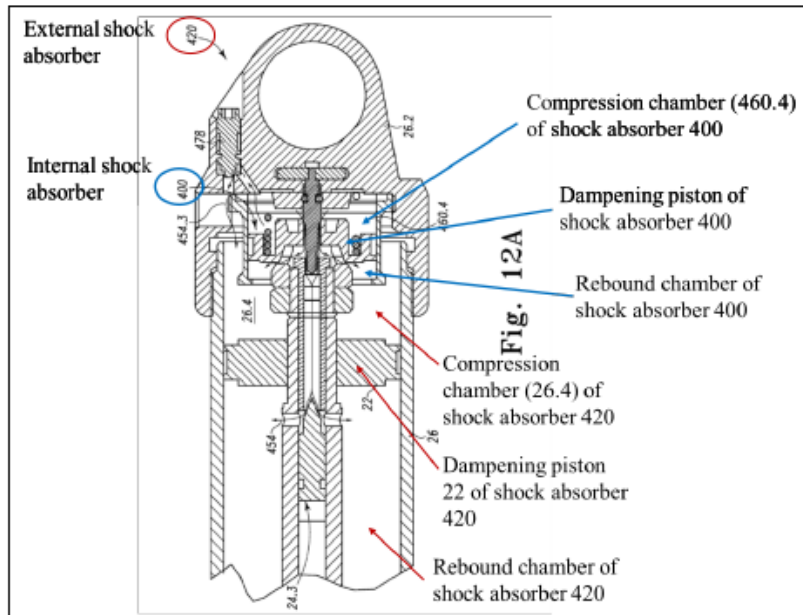


Fig. 12A

Pet. 116. In Petitioner's annotated Figure 12A, Petitioner marks bottom out piston (light orange), bottom out cup 260, 460 (pink), compression chamber 26.4 (light red), screw type valve 478 needle (dark purple), screw (light purple), and a fluid path (blue). *Id.* Petitioner further asserts that during a compression stroke with the bottom out piston, the fluid flows from bottom out cup to compression chamber at a first rate with the screw type valve 478 (needle (dark purple), screw (light purple)) in a first position and at a second rate with the screw type valve in a second position. *Id.* at 115. Petitioner adds that the capacity of the fluid flow path 454.3 is adjustable via adjustable screw type needle valve 478. *Id.* at 110.

(2) *Patent Owner's Contentions*

Patent Owner argues that Gartner does not disclose a “bottom out cup” because Gartner expressly discloses second internal shock absorber 400 placed within shock absorber 420. PO Resp. 58–60. Patent Owner provides an annotated version of Gartner’s Figure 12A, reproduced below.



PO Resp. 59. Patent Owner’s annotated Figure 12A is marked with the respective compression and rebound chambers within shock absorber 420 and internal shock absorber 400. *Id.* Patent Owner contends that

[i]nternal shock absorber 400 includes a damper chamber that is divided by a piston into a compression chamber (volume 460.4) and a rebound chamber. Ex. 2010, ¶106. Compression volume 460.4 is the primary compression chamber of the internal shock absorber 400, and is not a “bottom out cup.”

Id. at 60.

(3) *Discussion*

Based on the complete record, we determine that Petitioner has demonstrated by a preponderance of the evidence that Gartner anticipates claim 19. As Petitioner has marked in its annotated version of Figure 12A

shown above, we find that Gartner's shock absorber 420 includes bottom out piston, bottom out cup 260, 460, compression chamber 26.4, screw type valve 478, and a fluid that flows in at least the fluid path marked in blue. *See Pet.* 116.

Patent Owner argues that Gartner does not identify or describe element 460.4 (or 460) of internal shock absorber 400 as a "bottom out cup." PO Sur-reply 22; PO Resp. 60. Patent Owner adds that Gartner's compression volume 460.4 within internal shock absorber 400 cannot be considered a bottom out cup because it is part of a shock absorber. PO Sur-reply 23 (citing Ex. 1020, 150:24–152:11 55:3–67:12, 71:2–72:2, 154:3–18).

To better understand Gartner, we note that shock absorber 420 contains features of shock absorber 220 described with reference to Gartner's Figures 6–8. *See Ex.* 1010, 9:20–24 ("Shock absorber 420 is the same as shock absorber 220 as previously described, except for the changes which are shown and described herein."). In Figure 6, Gartner depicts shock absorber 220 that includes second, internal shock absorber 200. *Id.* at 7:11–13. Internal shock 200 includes cylinder 260 that is coupled to internal compression end 28 of shock 220. *Id.* at 7:14–16. Retaining lip 262 of cylinder 260 captures piston 250 therein and spring 270 biases piston 250 away from end 28 to create *internal compression volume 260.4*. *Id.* at 7:18–20 (emphasis added). Gartner further discloses that "the damping forces of shock absorber 220 are provided by a main compression flowpath 32" and "second shock absorber 200 is inactive, and does not provide any damping force." *Id.* at 7:49–51, 7:55–56. "As the vehicle suspension continues to compress, ram 276 of rod 24 comes into contact with the complimentary-shaped pocket of piston 250." *Id.* at 7:58–60. Gartner explains that [a]s shock absorber 220 continues in the compression stroke, ram 276 pushes

piston 250 relative to cylinder 260. This relative motion results in a reduction in compression volume 260.4. *Id.* at 7:62–67.

With respect to the similar structures described in Figure 12A, Gartner discloses internal shock absorber 400 within shock absorber 420. *Id.* at Fig. 12A. Internal shock absorber 400 includes compression volume 460.4. *Id.* In operation, we understand external shock absorber 420 and internal shock absorber 400 to function similar to the embodiment shown in Figures 6–8 where the second shock absorber 400 is inactive, and does not provide any damping force during the initial portion of the stroke. *Id.* at 7:49–51, 7:55–56, 9:20–24. As the suspension continues to compress, the motion results in a reduction in compression volume 460.4. *See id.* at 7:62–67.

It bears mentioning that Gartner discloses these structural features – shock absorber within a shock absorber – to more generally address how to protect a shock absorber from bottoming. *See* Ex. 1010, code (54).

Gartner’s Abstract provides:

Methods and apparatus for accommodating vehicle suspensions that may *bottom out*. Some embodiments of the present invention include the secondary shock absorber placed within a primary shock absorber. Yet clear embodiments describe a shock absorber having multiple fluid flowpaths during compression, with one of the flowpaths being active near the *bottoming-out condition*.

Id. code (57) (emphases added). Though Gartner does not explicitly employ the term “bottom out cup,” it is not lost upon us that the internal shock absorber, e.g., shock absorber 400, functions during/in a compression stroke (e.g., after the initial portion of the compression stroke), to provide dampening while protecting from bottoming out.

Considering Gartner’s disclosure, we credit Dr. Wang’s testimony because his testimony is better supported by the reference. Dr. Wang

testifies that “bottom out cup 260, 460 (pink) is a cup-shaped feature configured for providing damping . . . [and] bottom out cup 260, 460 (pink) is formed at the end of compression portion 26.4 (light red) and provides additional damping to reduce bottoming out[.]” Ex. 1019 ¶ 58 (citing Ex. 1010, Abstract, annotated Fig. 12A, 1:15–33, 9:33–48; Ex. 1002 ¶¶ 179–180, 188–190; Pet. 108–110). As discussed above, internal shock absorber 400 contains cup-shaped compression volume 460.4 that provides additional damping after the initial portion of the compression stroke. *See* Ex. 1010, 7:49–51, 7:55–56, 7:62–67, 9:20–24. Gartner further discloses these features as accommodating or protecting from bottoming out. *See id.* code (57).

Patent Owner’s position and Dr. Slocum’s testimony otherwise, requires Gartner to expressly invoke the term “bottom out cup” instead of compression volume. *See* Ex. 2010 ¶¶ 104–106. We disagree that is necessary. The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831 (Fed. Cir. 1990). We find that Gartner discloses a “cup-shaped feature configured for providing dampening at the end of a compression stroke.” Gartner discloses that internal shock absorber 400 provides damping after the initial portion of the stroke and as compression continues, compression volume 460.4 reduces as part of that damping. Ex. 1010, 7:49–51, 7:55–56, 7:62–67, 9:20–24.

We also have not adopted Patent Owner’s proposed construction that a bottom out cup may provide damping *only* at the end portion of a compression stroke. PO Resp. 60; Sur-reply 24; *see also supra* sect. III.C.1. Thus, we are not persuaded that Gartner is distinguishable for this reason. *See also* Ex. 2010 ¶ 106 (“[N]owhere does Gartner disclose that internal

shock absorber 400 (or a portion thereof) is activated only at the end portion of a compression stroke to provide additional dampening, as required by the correct construction of a “bottom out cup.”).

We further find that Gartner teaches shock absorber 4000 includes auxiliary compression flowpath 454.3 with first passageway in end cap 26.2 interconnecting compression volume 460.4 with adjustment screw 478. Ex. 1010, 9:33–37. “As the screw is turned along the threads, a nose of screw 478 projects more or less into the second flow passage, and thereby forms more or less of a restriction to flow.” *Id.* at 9:45–47. This disclosure is consistent with and supports Petitioner’s position that Gartner discloses

in a compression stroke of the damper, the fluid flows from the bottom out cup to the compression chamber at a first rate with the valve in a first position and at a second rate with the valve in a second position where the first rate is greater than the second rate and the valve includes an adjuster accessible from an exterior of the shock absorber.

Ex. 1001, 8:66–9:5.

After review of the arguments and evidence, we conclude that Petitioner has demonstrated by a preponderance of evidence that claim 19 is anticipated by Gartner.

b) Claim 1

For claim 1, Petitioner presents arguments and evidence that are similar or identical to those discussed above for claim 19. *See* Pet. 105–110, 108–109 (“Gartner discloses ‘a bottom out cup formed at an end of the compression portion.’ Gartner discloses a bottom out cup 260, 460 (pink) formed at the end of compression portion 26.4 (light red).”) (citing Ex. 1010, Fig. 12A; Ex. 1002 ¶ 179; Ex. 1003 ¶ 174).

Patent Owner relies on the same arguments discussed above for claim 19. PO Resp. 58–60; PO Sur-reply 21–24.

Based on the reasons discussed above for claim 19, and the arguments and evidence presented by Petitioner (Pet. 105–110), we conclude that Petitioner has established by a preponderance of evidence that claim 1 is anticipated by Gartner.

c) Claim 2–5 and 9

Claims 2–5 and 9 depend from independent claim 1.

Petitioner contends that Gartner anticipates each of these claims. Pet. 111–113. For claim 4, Petitioner also contends that claim 4 is unpatentable over the asserted combination of Gartner and Kodama. *Id.* at 111–112.

Patent Owner does not address any of Petitioner’s arguments regarding these specific limitations beyond what it has presented for claims 1 and 19. PO Resp. 58–60, PO Sur-reply 21–24.

Based on the reasoning and evidence provided in the Petition (*see* Pet. 111–113), we determine that Petitioner has shown by a preponderance of evidence that claims 2–5 and 9 are anticipated by Gartner, and that claim 4 is rendered obvious by the asserted combination of Gartner and Kodama.

4. Conclusion

After review of the arguments and evidence, we conclude that Petitioner has established by a preponderance of evidence that claims 1–5, 9, and 19 are anticipated by Gartner. We determine that Petitioner has established by a preponderance of the evidence that claim 4 would have been obvious over Gartner and Kodama.

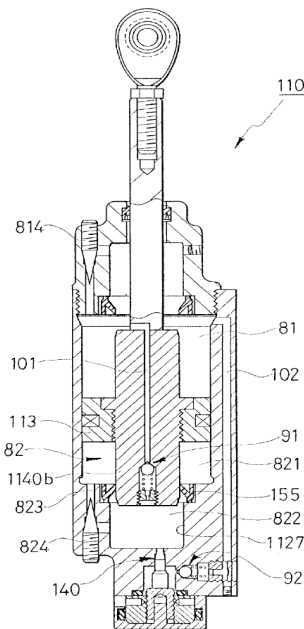
E. Claims 1–9, 11–15, and 19 Anticipated by Nakaya

Petitioner asserts independent claims 1, 11, and 19, and dependent claims 2–9 and 12–15 are anticipated by *Nakaya*. Pet. 21–52. For the

reasons that follow, we determine that Petitioner has demonstrated by a preponderance of the evidence that Nakaya anticipates claims 1–9 and 11–15. We determine that Petitioner has not demonstrated by a preponderance of the evidence that Nakaya anticipates claim 19.

1. *Nakaya (Ex. 1005)*

Nakaya is a U.S. patent titled “Air-Cylinder Apparatus for Prosthetic Limb.” Ex. 1005, code (54). Nakaya relates to an air-cylinder apparatus for use in a prosthetic limb designed for assisting the bending and stretching motion of an amputee’s knee. *Id.* at 1:6–8. Nakaya discloses the use of air as working fluid for the air-cylinder apparatus for its compressibility properties. *Id.* at 1:25–26. Figure 8 depicts air-cylinder apparatus 110 and is reproduced below:



Nakaya discloses that air-cylinder apparatus 110 comprises cylinder body 112. *Id.* at 6:25–26. The interior of cylinder body 112 is divided, by piston 113, into first chamber 81 located on the head side and second chamber 82 located on the bottom side. *Id.* at 6:37–39. In particular, Nakaya discloses

chamber 822 as a predetermined chamber which is defined within middle sized-diameter hole 1127. *Id.* at 9:6–10. At bottom part 112b, there is provided throttle passage 823 as an auxiliary passage for communicating with two chambers 821, 822. *Id.* at 9:12–15. Nakaya discloses a screw type needle valve 824 as a throttle valve. *Id.* at 9:16–17. Additionally, Nakaya describes throttle valve 824 can be “set” between 0.003–0.004 mm² for varying amounts of pressure in the chamber 821. *Id.* at 9:19–20, 9:27–29.

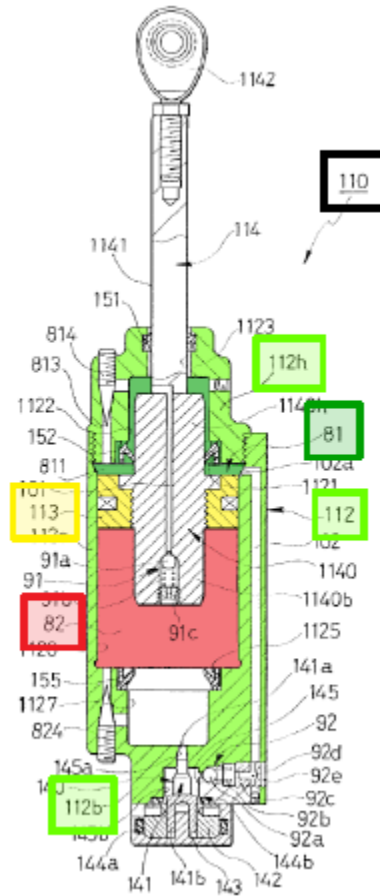
2. *Claim 1*

Petitioner contends that Nakaya discloses every limitation of claim 1. Pet. 21–33. Patent Owner opposes. PO Resp. 22–33.

a) A damper for a shock absorber comprising:

(1) Petitioner’s Contentions

Petitioner contends that “Nakaya discloses a fluid-based (air being the fluid) damper of a shock absorber 110 for a suspension system.” Pet. 21 (citing Ex. 1005, code (57), Figs. 7–9, 17–19). In the Petition, Petitioner provides an annotated version of Nakaya’s Figure 7, reproduced below:



Id. Annotated version of Nakaya's Figure 7 on page 21 of the Petition marks the damper in light green. *Id.* Referring to the annotated figure, Petitioner asserts that

[t]he damper is formed by a cylindrical body 112 (light green) that is closed on either end by head part 112h and bottom part 112b (light green). The volume formed in the damper is divided by a piston 113 (yellow) into a compression portion 82 (light red) and a rebound portion 81 (dark green).

Id. (citing Ex. 1005, Fig. 7; Ex. 1002 ¶ 52; Ex. 1003 ¶ 52), 29 (citing Ex. 1005, Fig. 7; Ex. 1002 ¶ 89; Ex. 1003 ¶ 89).

(2) *Patent Owner's Contentions*

Patent Owner argues that the preamble is limiting and that Nakaya's air cylinder apparatus for a prosthetic limb is not a "damper" and cannot be used as a damper. PO Resp. 22. Patent Owner contends that

[n]owhere does Nakaya disclose dissipation of energy, which is an essential characteristic of a "damper." Instead, Nakaya is an air-based system for a prosthetic limb to attain energy storage and recovery during walking in order to minimize energy expended by the amputee.

Id. at 22–23 (citing Ex. 2010 ¶ 55). Patent Owner further argues that a "damper" is intended to cushion hard landings and bumps by dissipating energy. *Id.* at 24–25 (citing Ex. 2010 ¶¶ 55, 56; Ex. 2011, 29:22–30:22). Patent Owner adds that

[e]ven if the pressure within chamber 82 (the alleged "compression chamber") of air-cylinderbody 112 increases due to bending motion of the knee, such increase in pressure is desired because it applies the necessary energy to help propel walking.

Id. at 25–26 (citing Ex. 2010 ¶ 61). According to Patent Owner, a POSITA would not recognize Nakaya's apparatus as a damper because if it were otherwise, "the user would strain to walk and would feel like they were walking or running in loose sand, which is not the intended function of a prosthetic limb." *Id.* at 26 (citing Ex. 2010 ¶ 59).

(3) *Discussion*

We observe first that Petitioner contends Nakaya is a damper because Nakaya's air-cylinder apparatus contains damping elements. Pet. Reply 7. In other words, Petitioner's point is that Nakaya discloses the necessary

structural features to perform the function of a damper, i.e., damping, and in fact performs damping.

We agree.

Turning to Nakaya, Figures 7 and 8 are provided below:

FIG. 7

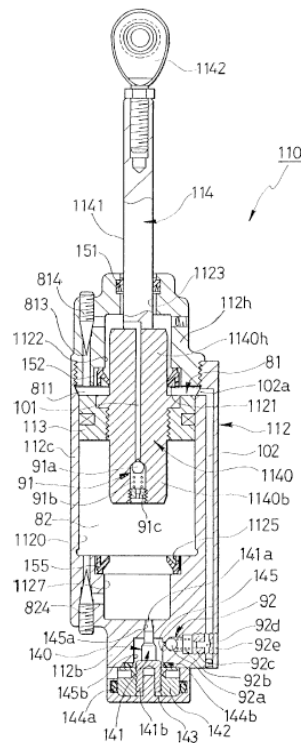
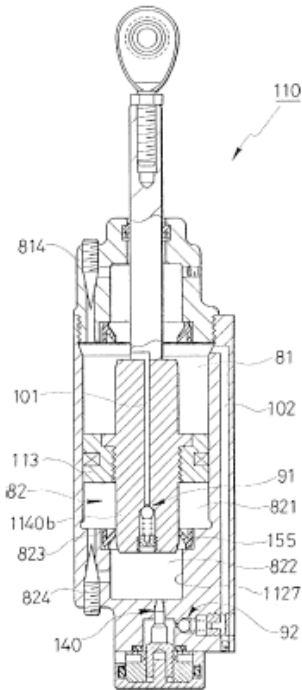


FIG. 8



In Figures 7 and 8, Nakaya discloses air-cylinder apparatus 110 with cylinder body 112. Ex. 1005, 6:25–26. Figure 7 shows “a state in which the knee is fully stretched and the bending angle is zero, Fig. 8 shows ... the knee slightly bent[.]” *Id.* at 6:18–21. As shown in both Figures 7 and 8, the interior of cylinder body 112 is divided, by piston 113, into first chamber 81 located on the head side and second chamber 82 located on the bottom side. *Id.* at 6:37–39. In Figure 8, Nakaya discloses chamber 822 as a predetermined chamber that is defined within middle sized-diameter hole 1127. *Id.* at 9:6–10.

Nakaya further teaches that at bottom part 112b, there is provided throttle passage 823 as an auxiliary passage for communicating with two chambers 821, 822. Ex. 1005, 9:12–15. Nakaya discloses a screw type needle valve 824 as a throttle valve that can be “set” between 0.003–0.004 mm² for varying amounts of pressure in the chamber 821. *Id.* at 9:16–17, 9:19–20, 9:27–29. Nakaya also discloses “constant throttle valve 140 is located within a step hole 145 disposed at a lower part of the bottom part 112 b of the cylinder body 112.” *Id.* at 8:3–5. Nakaya explains that “[b]y converting a rotary motion to a linear motion utilizing the threading engagement between the threaded ring 142 and the guide part 141b of the valve body 141, the constant throttle valve 140 can adjust the throttling degree and opening degree of the valve body 141.” *Id.* at 8:22–27. Additionally, Nakaya discloses that

[s]ince the constant throttle valve 140 is disposed on the second passage 102 and its valve body 141 is confronted with the opening leading to the second chamber 82, *the flow of air from the second chamber 82 towards the first chamber 81 is normally restricted.* An opening area of the constant throttle valve 140 is set, for example, 0.008 to 0.009 mm².

Id. at 8:27–33 (emphasis added).

With this disclosure in mind, Petitioner’s declarant, Dr. Eric Wang, testifies that a “POSITA would recognize that Nakaya includes both a spring (energy storage) and damper (energy dissipation) elements because it looks like a shock absorber, having a piston in a pressure cylinder that has a means for transferring fluid from one side to the other, thereby causing damping.” Ex. 1010 ¶ 20. Dr. Wang further opines that a POSITA would understand that

Nakaya’s throttle valves/passages 140, 832, 4824a, and 4824b provide damping . . . when the working fluid, air, is forced

through Nakaya's various restrictive components, like the throttle passage 823 and constant throttle valve 140 in the embodiment of Figures 7 to 9 ("Nakaya's First Embodiment") and the two paths around Nakaya's throttle valves 4824a, 4824b in the embodiment of Figures 17 to 19 ("Nakaya's Fourth Embodiment").

Id. ¶¶ 20–21.

Consistent with Dr. Wang's testimony, Patent Owner's own arguments and Dr. Slocum's testimony support Petitioner's position. In the Patent Owner Response, Patent Owner relies on Dr. Slocum's declaration testimony for the proposition that "[t]he Nakaya apparatus is not a 'damper,' nor can it be used as such, because nowhere does Nakaya disclose dissipation of energy, which is an essential characteristic of a 'damper.'" PO Resp. 22 (citing Ex. 2010 ¶ 55). Nevertheless, Patent Owner concedes Nakaya discloses damping through restrictive air flow components. In particular, Patent Owner states that

Nakaya's system is thus "double acting" with equal active energy storage in both downward and upward directions, which is achieved through air compression and *only a minimal amount of damping due to the use of metered orifices for air flow*.

Id. at 15 (citing Ex. 2010 ¶ 58) (emphasis added). Dr. Slocum further testified under cross-examination that Nakaya provides damping. An exchange between Petitioner's counsel and Dr. Slocum is provided below:

Q. Thank you. Dr. Slocum, Nakaya performs damping during the compression stroke, correct?

A. *It is a -- part of what it does is*, its primary thing, again, it's a prosthetic limb device, if you provided *a lot of damping*, it will be like running through sand. So the primary function is actually energy storage and return.

Ex. 1020, 90:22–91:5 (emphasis added). Dr. Slocum added during the same cross-examination that

You can't only -- you can't have a pure energy storage device. Any time you're moving fluid, right, there will be losses. And so your goal is to make them happen where you want them to happen to give you the dynamic response you want. For the knee, this prosthetic device, for example, *if it had absolutely zero damping and it was a [sic] idealistic pure mechanical spring, you couldn't walk[.]*

Id. at 99:15–24 (emphases added).

While Dr. Slocum and Patent Owner agree that Nakaya provides damping, the dispute is whether Nakaya provides enough damping. Dr. Slocum testifies that Nakaya's "damping level is typically a couple percent at most. You need a little bit, like just a pinch of salt in your stew, to make it very responsive." Ex. 1020, 100:24–101:2. Patent Owner asserts that "Nakaya apparatus is not a 'damper' because it does not dissipate *significant* amounts of energy, which is an essential characteristic of a 'damper.'" PO Sur-reply 9 (emphasis added).

Nevertheless, Patent Owner has not explained sufficiently how claim 1 requires "significant" or more than "a couple percent" of damping. Patent Owner contends that a "damper" is intended to cushion hard landings and bumps by dissipating energy. PO Resp. 24–25 (citing Ex. 2010 ¶¶ 55, 56; Ex. 2011, 29:22–30:22). Yet, that is precisely what Dr. Slocum testifies happens in Nakaya's apparatus. Dr. Slocum states that

[Nakaya's] damping level is typically a couple percent at most. You need a little bit, like just a pinch of salt in your stew, to make it very responsive. *You want it to feel like spring in your step*, but you don't want to then start going unstable, because that's very bad.

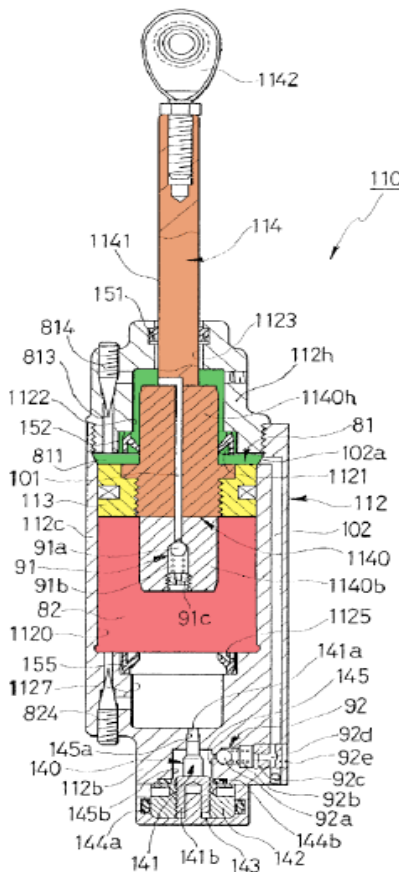
Ex. 1020, 100:24–101:4 (emphasis added). In our view, Dr. Slocum's testimony that Nakaya's damping provides a "spring in your step" without instability is consistent and in line with Patent Owner's description of a

“damper” as intended to “cushion hard landings and bumps by dissipating energy.”

In this way, we find that Nakaya’s disclosure and the testimonies of Dr. Slocum and Dr. Wang support Petitioner’s position. In other words, Petitioner has identified how Nakaya’s disclosed structure performs (and is reasonably capable of performing) the function of damping as a damper. Thus, Petitioner has shown that Nakaya discloses a “damper.”

b) a damper chamber divided by a piston and shaft into a compression and rebound portions

Petitioner contends that Nakaya discloses “a damper chamber divided by a piston and shaft into a compression and rebound portions.” Pet. 29–30. Petitioner provides an annotated version of Nakaya’s Figure 7, reproduced below:



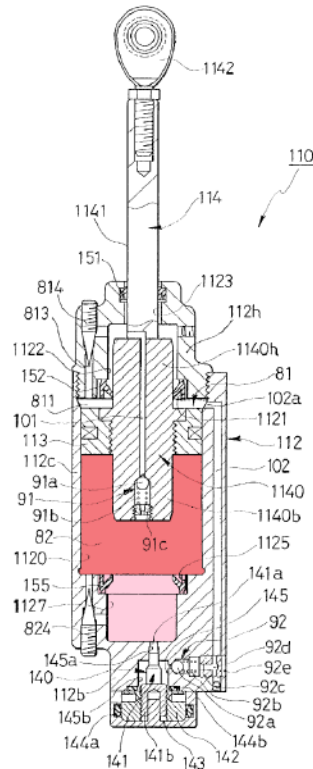
Id. at 30. Petitioner’s annotated version of Figure 7 from page 30 of the Petition marks piston 113 in yellow; piston shaft/rod 114 in dark orange; compression portion in light red; and rebound portion 81 in dark green. *Id.* at 29 (citing Ex. 1005, Fig. 7; Ex. 1002 ¶ 90; Ex. 1003 ¶ 90).

Patent Owner does not specifically contest Petitioner’s contentions with respect to this limitation, aside from the arguments discussed for the preamble. PO Resp. 22–26.

Based on our review of the complete record, we agree with and adopt Petitioner’s arguments as our own. Pet. 29–30. Additionally, we have considered Patent Owner’s arguments regarding “damper,” but find that Petitioner has explained sufficiently with reference to Nakaya’s disclosure and expert testimony how Nakaya discloses this limitation. *Id.*; see PO Resp. 22–26.

*c) a bottom out cup formed at an end of the
compression portion*

For this limitation, Petitioner provides an annotated version of Nakaya’s Figure 7, reproduced below:



Pet. 31. Petitioner's annotated version of Figure 7 from page 31 of the Petition marks bottom out cup 1125, 1127 in pink at the end of compression portion 82 in light red. Pet. 31 (citing Ex. 1005, Fig. 7; Ex. 1002 ¶ 91; Ex. 1003 ¶ 91).

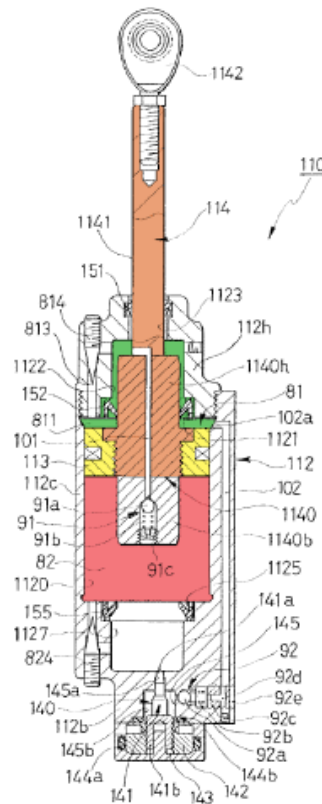
Patent Owner does not specifically contest Petitioner's contentions with respect to this limitation, aside from the arguments discussed for the preamble. PO Resp. 22–26.

Further, we note that Petitioner provides annotated versions of Nakaya's Figures 7 and 8 on page 22 of the Petition (reproduced below).

diameter section 1140 at a stage where the bending angle of the knee exceeds a predetermined value.

Id. at 8:49–56. Based on these teachings, we understand Nakaya to disclose that holes 1125, 1127 receive enlarged-diameter section 1140 of piston 113 when the knee prosthetic is bent, and that seal member 155 is adapted to seal the outer periphery of projection 1140b when projection 1140b engages the holes, i.e., bottom out cup.

Additionally, Petitioner asserts that Nakaya’s air-cylinder apparatus 110 includes a damper with a “compression portion,” shown in light red in the annotated version of Figure 7 from page 30 of the Petition.



Annotated version of Figure 7 marks piston 113 in yellow, compression portion 82 in light red, and rebound portion 81 in dark green. Pet. 30. When considering Petitioner’s annotated compressed portion 82 in light red with

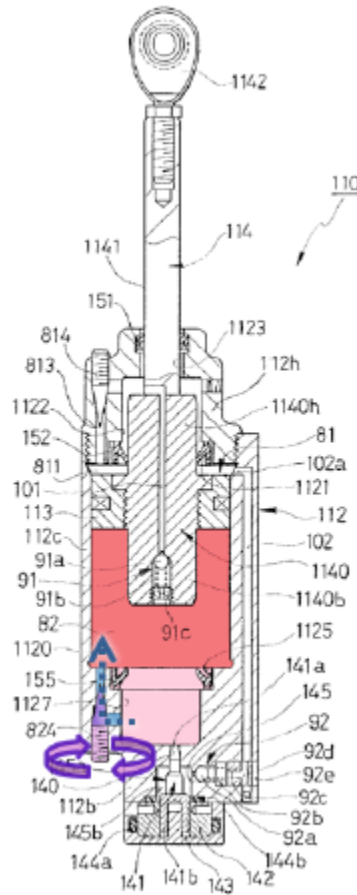
Nakaya's Figure 8, we discern that piston projection 1140b is engaged with holes 1125, 1127 in what Petitioner has asserted to be the "compression portion." In other words, we understand Petitioner's position to be that Nakaya's Figure 8 depicts a compression stroke where projection 1140b is engaged with holes 1125, 1127 during a compression stroke to provide damping.

Based on the complete record, we determine that Petitioner has explained sufficiently how Nakaya discloses this limitation.

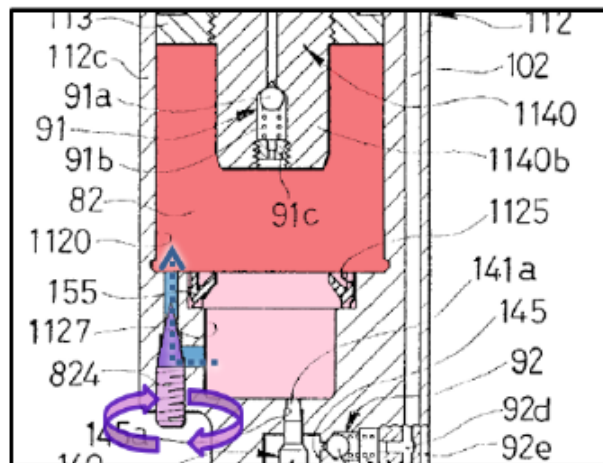
d) a fluid flow path formed in the bottom out cup for providing fluid communication from the cup to the compression portion of the chamber during a compression stroke of the damper

(1) Petitioner's Contentions

For these limitations, Petitioner contends that Nakaya discloses throttle passage 823 between chamber 821 and chamber 822. Pet. 31–32. To better explain, Petitioner provides an annotated version of Nakaya's Figure 7, reproduced below:



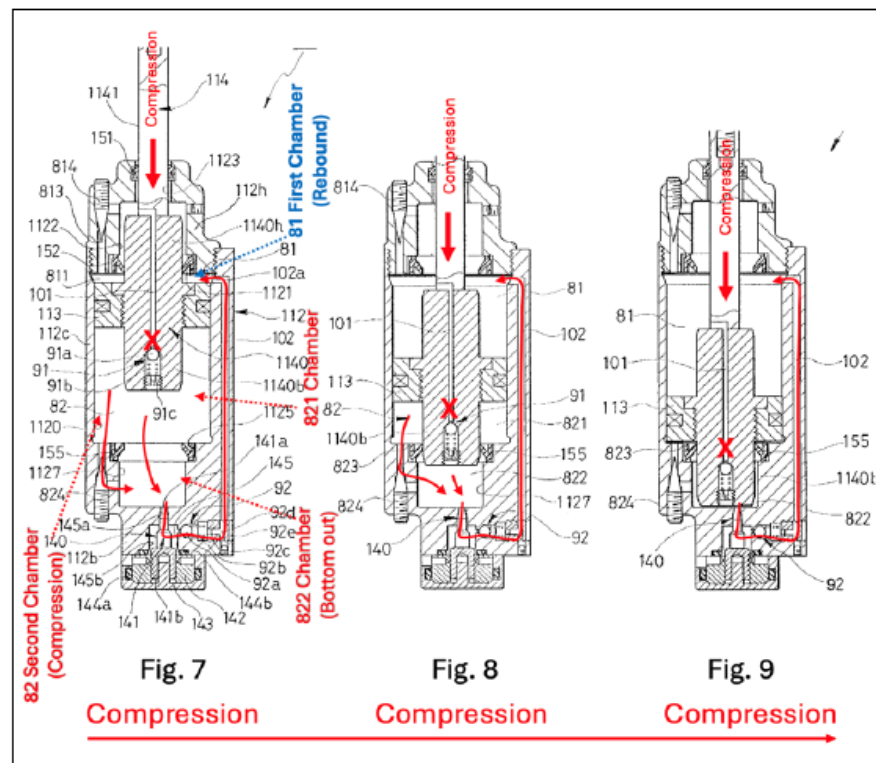
Id. at 32. Annotated version of Figure 7 on page 32 of the Petition marks compression portion 82 in light red, bottom out cup in pink (1125, 1127), and fluid path 823 in blue. *Id.* Petitioner also provides a zoomed-in view of Petitioner's annotated Figure 7 of Nakaya.



Id. Petitioner’s annotated figure shows fluid flow path 823 in blue with a purple arrow indicating flow direction between chamber 821 in red and chamber 822 in pink. *Id.*

(2) *Patent Owner’s Contentions*

In response, Patent Owner contends that “air (fluid) flows from Nakaya’s compression chamber 82 to the alleged ‘bottom out cup’ during a compression/downward stroke in Nakaya’s air cylinder apparatus 110 (the reverse of the flow recited in the claim).” PO Resp. 27. To explain, Patent Owner annotates Figures 7, 8, and 9 from Nakaya, reproduced below:



Annotated Figures 7, 8, and 9 purportedly demonstrate air flow in Nakaya’s apparatus during compression. *Id.* (citing Ex. 2010 ¶ 64). According to Patent Owner, annotated Figure 7 depicts the start of compression where

piston rod 114 and piston 113 travel downwards and forces air to flow out of second chamber 82 (e.g., “compression chamber” or “compression portion”) into first chamber 81 (rebound chamber). PO Resp. 28 (citing Ex. 2010 ¶ 65). Patent Owner contends that chamber 82 is divided into upper part 821 and lower part 822, which is defined by holes 1125, 1127 (i.e., “bottom out cup”). *Id.* Patent Owner further contends that air travels from upper compression chamber 821 by: (1) a first path of least resistance directly into chamber 822 (defined by holes 1125, 1127); and (2) a second path of higher resistance is through throttle passage 823. *Id.* at 28–29.

Referring to annotated Figure 8, Patent Owner contends piston rod 114 continues to travel and causes projection 1140b to engage seal member 155. PO Resp. 29 (citing Ex. 2010 ¶ 66). Patent Owner asserts that the flow from chamber 821 must go through throttle passage 823 to flow into chamber 822, and a combined flow is throttled by valve 140 to increase pressure in chamber 822 and 821. *Id.* This pressure, according to Patent Owner, causes check valve 92 to open air flow to chamber 81 via passage 102. *Id.* In annotated Figure 9, Patent Owner contends the piston has made contact with the end of upper compression chamber 821, and “there is very little air remaining in chamber 821 to flow down through throttle passage 823, and the last of the air in chamber 822 has just flowed through throttle valve 140 and check valve 92 and up through passage 102 into rebound chamber 81.” PO Resp. 30 (citing Ex. 2010 ¶ 67).

Patent Owner contends that Petitioner and its experts, Dr. Wang and Mr. Wesling, are incorrect that air flows from Nakaya’s holes 1125, 1127 to upper compression chamber 821 during a compression stroke. PO Resp. 30 (citing Ex. 2010 ¶¶ 72–73). Patent Owner argues that air does not flow into chamber 821 to increase pressure; rather, air flows from chamber 821 to

lower chamber 822 if pressure in chamber 821 is greater than chamber 822. *Id.* (citing Ex. 2010 ¶ 74); *see also* PO Sur-reply 12 (“[P]ressure in compression chamber 821 increases because of the downward motion of piston 113 during a compression stroke and the resistance to air flow provided by throttle valve 824 in passage 823.”).

(3) *Discussion*

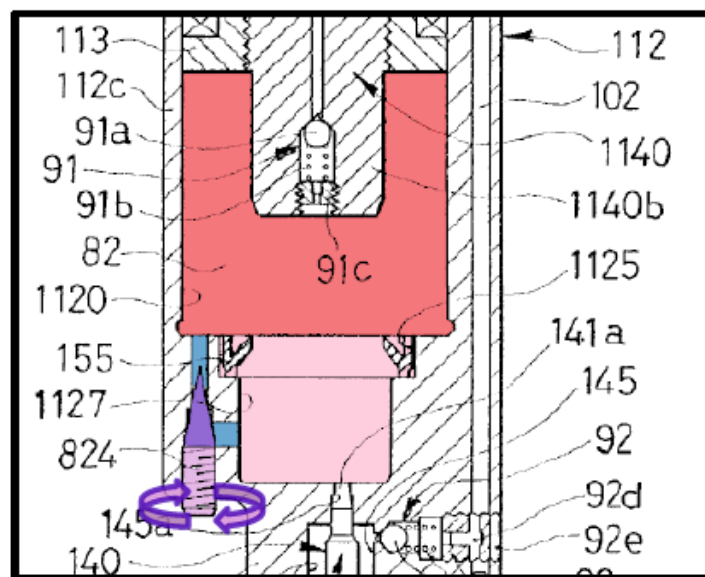
Initially, we reiterate that the ordinary and customary meaning of the claim phrase “a fluid flow path formed in the bottom out cup for providing fluid communication from the cup to the compression portion of the chamber during a compression stroke of the damper” requires structure that allows for a fluid flow path to provide *fluid communication* from the bottom out cup to a compression portion of a chamber, without limiting that fluid flow to any one direction. *See supra* sect. III.C.2. Patent Owner’s arguments with regard to this limitation are premised on a proposed construction we have not adopted. *Id.* As such, we are not persuaded that Nakaya must disclose a fluid flow in the direction from chamber 822 through throttle passage 823 to chamber 821 for anticipation.

Next, we note that Nakaya expressly teaches “[a]t the bottom part 112b, there is provided a throttle passage 823 as an auxiliary passage for communicating with the two chambers 821, 822.” Ex. 1005, 9:12–14. Nakaya further discloses that midway of throttle passage 823, screw type needle valve 824 is a throttle valve that may be used to increase the pressure in chamber 821. *Id.* at 9:16–17, 9:28–29. From this disclosure, we understand that air flows through throttle passage 823 between chambers 821 and 822, and the air flow through throttle passage 823 may be adjusted by throttle valve 824. Patent Owner acknowledges that air flows from chamber 821 to 822 during compression and may purportedly flow from

chamber 822 to chamber 821 during rebound. PO Resp. 27–33 (citing Ex. 2010 ¶¶ 63–78). As such, we find that Nakaya’s throttle passage provides fluid communication from the bottom out cup to the compression portion of the chamber. In addition, Nakaya’s throttle passage provides that fluid communication regardless of whether Nakaya’s prosthetic is in compression or rebound, or whether the fluid flows from chamber 821 to 822, or vice versa. This is because the structure of the fluid flow path that provides the fluid communication remains the same regardless of compression or rebound etc. Accordingly, we determine Petitioner has sufficiently explained how Nakaya discloses “a fluid flow path formed in the bottom out cup for providing fluid communication from the cup to the compression portion of the chamber during a compression stroke of the damper.”

e) wherein the capacity of the fluid flow path is adjustable.

Petitioner contends that Nakaya discloses “wherein the capacity of the fluid flow path is adjustable.” Pet. 33. Petitioner provides a zoomed-in and annotated version of Nakaya’s Figure 7, reproduced below:



Id. The annotated figure shows screw type needle valve 824 in purple. *Id.* Referring to the annotated figure, Petitioner explains that the fluid flow path is adjustable via screw type needle valve 824. Pet. 33.

Patent Owner does not specifically contest Petitioner's contentions with respect to this limitation. *See generally* PO Resp.; *see generally* PO Sur-reply.

Based on the complete record, we agree with Petitioner, particularly in light of Nakaya's disclosure that screw type needle valve 824 can be used to increase pressure in chamber 821. Ex. 1005, 9:24–29.

f) Conclusion

After review of the arguments and evidence, we conclude that Petitioner has established by a preponderance of evidence that claim 1 is anticipated by Nakaya.

3. Dependent Claims 2 and 3

Dependent claims 2 and 3 each depend, directly or indirectly, from independent claim 1. Ex. 1001, 7:49–53. Petitioner contends Nakaya discloses the limitations of “the capacity of the flow path is adjustable with an adjustable valve, the valve restricting the fluid flow” (claim 2) and “the adjustable valve is manually adjustable and accessible externally of the damper” (claim 3).

For these limitations, Petitioner contends that Nakaya's screw type needle valve 824 is manually adjustable and externally accessible, and restricts the fluid flow when present in fluid flow path 823. Pet. 33 (citing Ex. 1005, Fig. 7; Ex. 1002 ¶¶ 94–95; Ex. 1003 ¶¶ 93–94).

Patent Owner does not address any of Petitioner's arguments regarding these specific limitations beyond what it has presented for claim 1. *See generally* PO Resp.; *see generally*, PO Sur-reply.

Based on our review of the complete record, we agree with and adopt Petitioner's arguments as our own. *See* Pet. 33.

4. *Dependent Claim 4*

Claim 4 depends, directly or indirectly, from independent claim 1. Ex. 1001, 7:53–56. Claim 4 recites “the adjustable valve can be adjusted between a closed position and a plurality of open positions.” *Id.*

For these limitations, Petitioner contends that a screw type needle valve can be adjusted to “an effectively infinite number of positions between open and closed.” Pet. 34.

Patent Owner does not address any of Petitioner's arguments regarding these specific limitations beyond what it has presented for claim 1. *See generally* PO Resp., *See generally* PO Sur-reply.

Based on the reasoning and evidence provided in the Petition (*see* Pet. 34), which we adopt as our own, we determine that Petitioner has shown by a preponderance of evidence that claim 4 is anticipated by Nakaya.

5. *Dependent Claims 5–9*

Dependent claims 5–9 depend directly from independent claim 1. Ex. 1001, 7:57–8:4.

For claim 5, Petitioner contends Nakaya discloses fluid path 101 between bottom out cup 1125, 1127 and the rebound portion of chambers 81, 82. Pet. 35 (citing Ex. 1005, Fig. 8; Ex. 1002 ¶ 96; Ex. 1003 ¶ 95).

For claim 6, Petitioner contends Nakaya's fluid path 101 is adjustable with a check valve 91 to permit the flow of fluid in a single direction between the chambers 81, 82, bottom out cup, and the rebound portion. Pet. 36 (citing Ex. 1005, Fig. 7; Ex. 1002 ¶ 97; Ex. 1003 ¶ 96).

For claim 7, Petitioner asserts that Nakaya discloses that check valve 91 is arranged in fluid path 101 between holes 1125, 1127 (i.e., bottom out

cup) and the rebound portion to permit fluid communication between the holes and the rebound portion during a rebound stroke of shaft 114. Pet. 36–37 (citing Ex. 1005, Fig. 8; Ex. 1002 ¶ 98; Ex. 1003 ¶ 97).

For claim 8, Petitioner contends that Nakaya’s screw type needle valve 814 adjusts the volume of fluid traveling through throttle passage 813 and first passage 101. Pet. 37–38.

Petitioner further asserts that Nakaya discloses fluid paths 140 and 102, which disclose “a second fluid flow path within the bottom out cup” required by claim 9. Pet. 40.

Patent Owner does not address any of Petitioner’s arguments regarding these specific limitations beyond what it has presented for claim 1. *See generally* PO Resp., *see generally* PO Sur-reply.

Based on the reasoning and evidence provided in the Petition (*see* Pet. 35–40), which we adopt as our own, we determine that Petitioner has shown by a preponderance of evidence that claims 5–9 are anticipated by Nakaya.

6. *Claim 11*

For independent claim 11, Petitioner contends Nakaya discloses a fluid damper that includes “a damper chamber divided by a piston mounted on a movable rod, into a primary compression and a primary rebound chamber.” Pet. 41. For these limitations, Petitioner provides an annotated version of Nakaya’s Figure 7, reproduced below:

a first position in which bottom out piston 1140b is not housed in bottom out cup 1125, 1127, as shown in Nakaya's Figure 7. Pet. 43. Petitioner adds that Nakaya discloses a second position in Figure 8 in which bottom out piston 1140b is housed therein and engaged with seal members 155. *Id.* (citing Ex. 1005, Figs. 7–8; Ex. 1002 ¶ 106; Ex. 1003 ¶ 104).

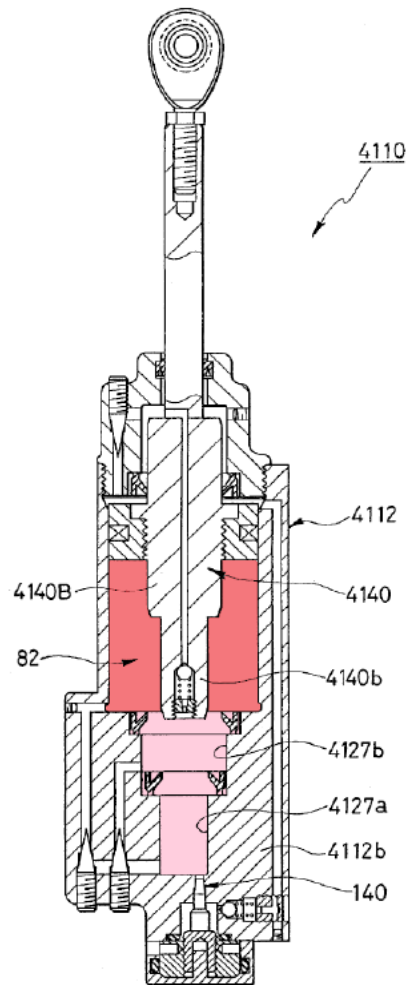
Claim 11 further recites

an adjustable fluid flow path formed in the cup, the flow path providing fluid communication between the cup and the primary compression chamber in a compression stroke of the damper.

Ex. 1001, 8:20–23. Petitioner argues that Nakaya discloses fluid flow path 823 formed in holes 1125, 1127 for fluid communication between holes 1125, 1127 and primary compression chamber 82 during a compression stroke of the damper. Pet. 45 (citing Ex. 1005, 9:22–30). Petitioner adds that this path is “adjustable via screw type needle valve 824.” *Id.*

In addition to Figure 7, we note that Petitioner alternatively relies on a separate embodiment disclosed in Nakaya's Figure 17. Pet. 41–42.

Petitioner's annotated version of Figure 17 is provided below:



Petitioner's annotated version of Figure 17 shows bottom out cup 4127a, 4127b in light pink and compression chamber 82 in light red. *Id.* at 41–42. Petitioner contends that bottom out cup 4127a, 4127b is formed to be in fluid communication with compression chamber 81, 82. *Id.* (citing Ex. 1005, Fig. 17; Ex. 1002 ¶ 105; Ex. 1003 ¶ 103). Petitioner further asserts that in this embodiment, Nakaya's bottom out piston 4140 is formed on a movable piston shaft/rod for sealingly engaging an interior of bottom out cup 4127a, 4127b via two seal members. *Id.* at 44. Additionally, Petitioner argues that an adjustable fluid flow path is formed in bottom out cup 4127a, 4127b for providing fluid communication from the cup to primary

compression chamber 82 during the damper's compression stroke. Pet. 45. That path is adjustable via screw type needle valves 4824a, 4824b. *Id.* at 45–46 (citing Ex. 1005, Fig. 17; Ex. 1002 ¶ 108; Ex. 1003 ¶ 106).

Patent Owner does not address any of Petitioner's arguments regarding these specific limitations beyond what it has presented for claim 1. *See generally* PO Resp., *see generally* PO Sur-reply.

Based on the reasoning and evidence provided in the Petition (*see* Pet. 41–46), including Petitioner's alternative arguments regarding two separate embodiments (e.g., Figure 7 and Figure 17), we determine that Petitioner has shown by a preponderance of evidence that claim 11 is anticipated by Nakaya.

7. *Dependent Claims 12, 14, and 15*

Dependent claims 12, 14, and 15 depend, directly, or indirectly, from independent claim 1. Ex. 1001, 8:24–35. Petitioner contends that Nakaya discloses all claim elements required by dependent claims 12, 14, and 15. Pet. 46–49.

Patent Owner does not address any of Petitioner's arguments regarding these specific limitations beyond what it has presented for claim 1. *See generally* PO Resp., *see generally* PO Sur-reply.

Based on the reasoning and evidence provided in the Petition (*see* Pet. 35–40), which we adopt as our own, we determine that Petitioner has shown by a preponderance of evidence that claims 12, 14, and 15 are anticipated by Nakaya.

8. *Claim 13*

Claim 13 depends directly, or indirectly, from independent claims 11 and 12. Ex. 1001, 8:27–30. Independent claim 11, also similarly recites:

an adjustable fluid flow path formed in the cup, *the flow path providing fluid communication between the cup and the primary compression chamber in a compression stroke of the damper.*

Id. at 8:20–23 (emphases added). Claim 13 recites:

The damper of claim 12, *further including a fluid flow path formed between the cup and the primary compression chamber; wherein the capacity of the fluid flow path is adjustable.*

Id. at 8:27–30 (emphases added).

Patent Owner does not present arguments addressing the limitations of independent claim 11 or claim 12 beyond those provided and discussed with regard to claim 1. *See supra* sect. III.D.6–7. Patent Owner, however, contends that claim 13 requires an additional fluid flow path that Petitioner has not adequately accounted for.

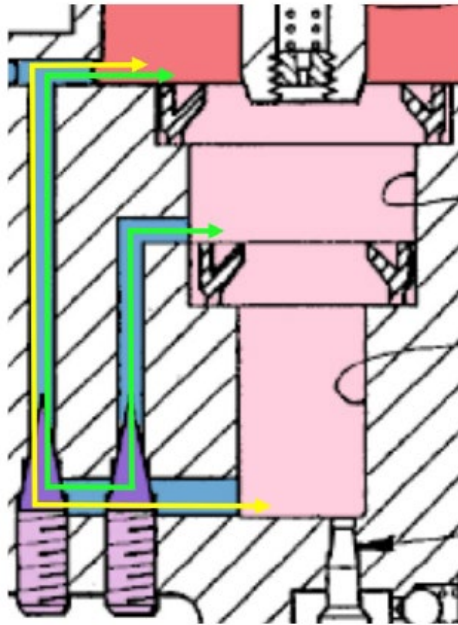
Petitioner argues that the limitations of claim 13 can be satisfied by a single fluid flow path shown in Nakaya’s Figure 7 embodiment or alternatively by two fluid flow paths shown in Nakaya’s Figure 17. Pet. 46–49; Pet. Reply 18–23. Petitioner contends that Patent Owner’s own infringement contentions in the parallel district court proceeding maps these limitations to the same fluid flow path in the accused product(s). Pet. Reply 15–18. Alternatively, Petitioner contends that even if two fluid flow paths are required, these paths can overlap and are disclosed by Nakaya’s embodiment shown in Figure 17. *Id.* at 20.¹²

¹² Petitioner further reserves the right to challenge claim 13 on the basis of indefiniteness in district court, but acknowledges that indefiniteness is not at issue in the instant proceeding. Pet. Reply 15 n.2.

In response, Patent Owner contends that Petitioner has misrepresented Patent Owner's infringement positions in district court because "Patent Owner's infringement expert report, which represents Patent Owner's current infringement positions . . . map[s] two separate flow paths for claims 11 and 13." PO Sur-reply 13. Patent Owner further contends that claim 13 requires an additional fluid flow path distinct from the fluid flow path recited in independent claim 11. *Id.* at 12 ("There can be no dispute that claims 11 and 13 require two separate fluid flow paths: 'an adjustable fluid flow path formed in the cup' (claim 11) and a separate 'fluid flow path formed between the cup and the primary compression chamber' (claim 13).") (emphasis omitted)) (citing Ex. 2010 ¶ 79). Patent Owner argues that the embodiment disclosed in Nakaya's Figure 17 does not provide a second fluid flow path between the cup and the primary compression chamber because "the auxiliary connector connects the upper and lower portions of the alleged 'bottom out cup,' and does not provide fluid connection between the upper portion (volume 4127b/chamber 4822a) of the 'bottom out cup' and compression chamber 4822b as alleged by Petitioner." *Id.* at 14.

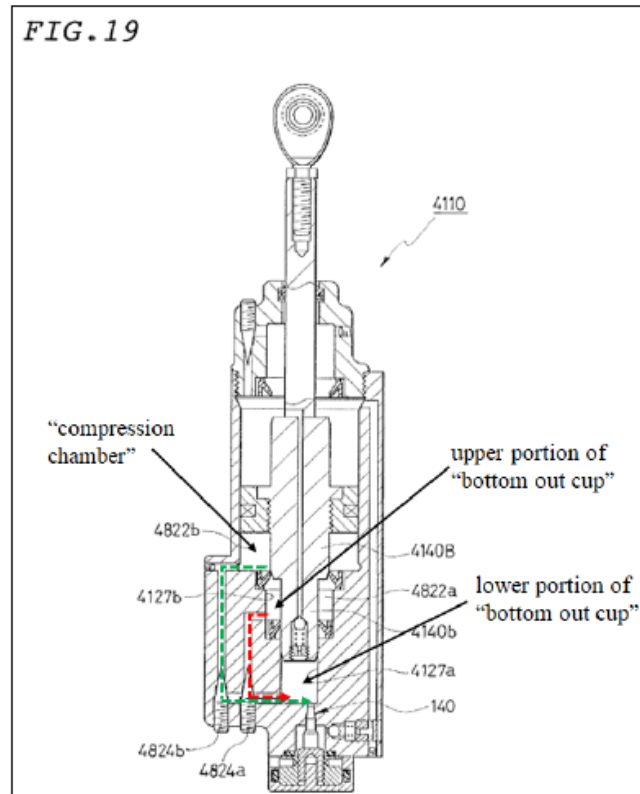
Based on the complete record, Petitioner has the better argument. To wit, if claim 13 is construed to recite the same or identical fluid flow path as recited in claim 11, we find that Nakaya's embodiment, described in Figures 7 and 8, discloses throttle passage 823 "as an auxiliary passage for communicating with the two chambers 821, 822." Ex. 1005, 9:12–14. Throttle passage 823 provides this fluid communication *between* the cup (e.g., middle sized-diameter hole 1127) and the primary compression chamber 821. *See* PO Resp. 28 (annotated Figures 7–9 depicting fluid flow according to Patent Owner's red lines).

On the other hand, if two fluid flow paths are required, Petitioner explains that Nakaya's embodiment shown in Figures 17–19 provides for more than one fluid flow path between the cup and compression chamber. Petitioner's annotated and magnified version Figure 17 is provided below:



Petitioner's annotated Figure 17 marks two fluid flow paths, one shown with a green arrow, and another shown with a yellow arrow. Pet. 19 (citing Ex. 1019 ¶ 43).

Patent Owner disputes Petitioner's reading of Nakaya and provides its own annotated version of Nakaya's Figure 19, reproduced below:



Patent Owner's annotated Figure 19 includes a fluid flow path marked in green between chamber 4822b and reduced-diameter recess 4127a, and a fluid flow path marked in red from enlarged-diameter recess 4127b and reduced-diameter recess 4127a. PO Sur-reply 15. According to Patent Owner, the red fluid flow path is not formed between the cup and primary compression chamber because recesses 4127a-b are part of the bottom out cup. *Id.* at 13–15. Patent Owner adds that throttle valves 4824a, 4824b, throttle chambers 4822a, 4822b, respectively. *Id.* at 14 (citing Ex. 1005, 10:45–50). Because of this, Patent Owner maintains that Nakaya does not disclose any double throttling whereby the “upper portion (volume 4127b/chamber 4822a) communicates with compression chamber 4822b.” *Id.* at 14 (citing Ex. 2010 ¶ 81).

Patent Owner is correct that Nakaya describes throttle valves 4824a, 4824b in relation to recesses 4822a, 4822b, respectively. Ex. 1005, 10:48–

50. Yet, Nakaya also discloses that “throttle valves 4824a, 4824b may be set equal to each other or different from each other.” *Id.* at 10:52–54. The fluid flow paths are adjustable through throttle valves 4824a, 4824b, and are not described as excluding or obstructing fluid flow through other paths. *Id.* As such, we do not agree with Patent Owner that Nakaya’s fluid paths cannot pass through more than one throttle valve. Nakaya does not exclude such fluid flow and, in fact, contemplates the adjustment of throttle valves to change fluid flow.

Moreover, claim 13 does not, in contrast to independent claim 11, require that the fluid flow path is formed in the bottom out cup or that the fluid flow path provides fluid communication in a compression stroke of the damper. Ex. 1001, 8:20–23, 8:27–29. Rather, claim 13 recites “a fluid flow path *formed between the cup and the primary compression chamber*; wherein the capacity of the fluid flow path is adjustable.” Ex. 1001, 8:27–30 (emphases added). In this way, we consider claim 13 to require another fluid flow path between the cup and primary compression chamber that is not necessarily the same type of fluid flow path recited in claim 11.

Petitioner’s annotated version of Nakaya’s Figure 17 clearly indicates where a second fluid flow path is *formed* between recess 4127b and chamber 4822b. We find that Nakaya’s embodiment, shown in Figures 17–19, provides for this fluid flow path as shown by Petitioner’s magnified and annotated Figure 17. This is because Nakaya expressly describes the structural components that allow for fluid flow paths between recess 4127a and chamber 82. *See* Ex. 1005, Figs. 17–19, 10:45–54.

We are not persuaded otherwise by Patent Owner’s argument that separate and distinct claim elements cannot be met by the same prior art feature. PO Resp. 35–37. As discussed above, Petitioner explains where

and how Nakaya teaches two separate, distinct fluid flow paths formed between recess 4127b and chamber 4822b. Pet. 19. To be sure, there is overlap in the paths, but the structures that form the flow paths are not identical and provide different fluid flow pathways between chamber 4822b and reduced-diameter recess 4127a.

Accordingly, we find that Petitioner has demonstrated by a preponderance of the evidence that Nakaya discloses each and every limitation of claim 13.

9. Claim 19

a) Anticipation

Independent claim 19 recites:

in a compression stroke of the damper, *the fluid flows from the bottom out cup to the compression chamber* at a first rate with the valve in a first position and at a second rate with the valve in a second position where the first rate is greater than the second rate and the valve includes an adjuster accessible from an exterior of the shock absorber.

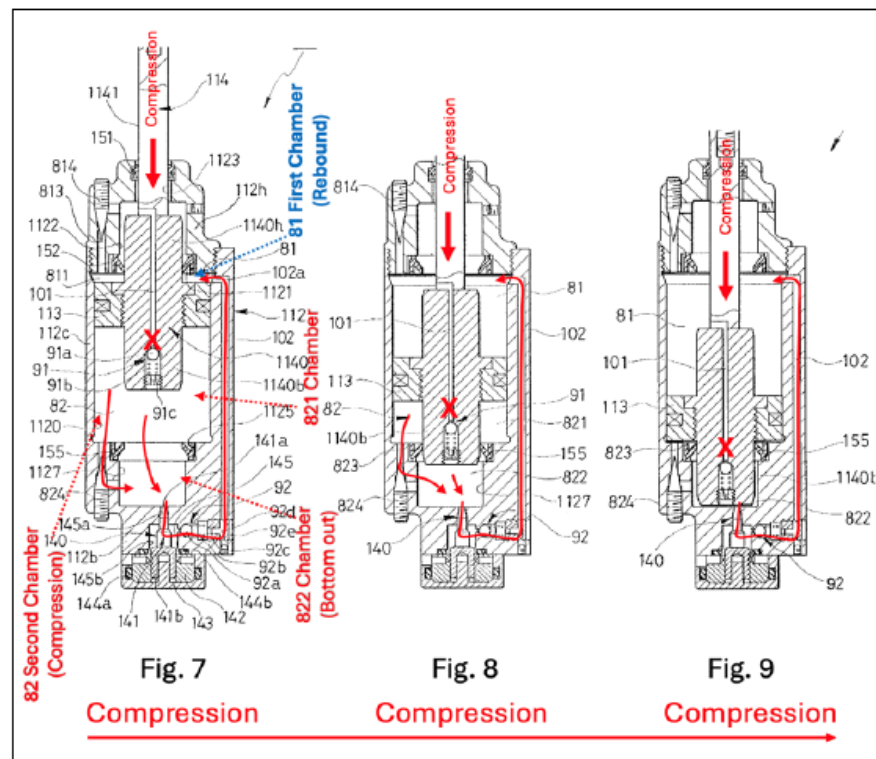
Ex. 1001, 8:66–9:5 (emphasis added).

Petitioner largely relies on the same citations and arguments presented for claims 1 and 11, but adds that the fluid flow rate is adjustable by Nakaya’s screw type needle valve 824 that is accessible from the exterior of shock absorber 110. Pet. 50–52. With regard to the recited fluid flow direction, Petitioner contends that “[a] POSITA would understand that Nakaya could be built to either allow air to move from the bottom out cup to the compression chamber, or vice versa, ‘depend[ing] on which region is reducing in volume faster.’” Pet. Reply 13 (citing Ex. 1002 ¶¶ 56–57). Petitioner further contends that

Nakaya states that the bottom out cup **1125, 1127** increases in pressure at a faster rate than the compression portion **82/821**, and as a result, air will move from the bottom out cup **1125, 1127** to the compression portion **82/821** during a compression stroke of the damper.”

Id. at 13–14 (citing Ex. 1019 ¶ 32); Ex. 1002 ¶¶ 56–57.

Patent Owner counters that Nakaya does not disclose the required fluid flow direction because “air (fluid) *flows from Nakaya’s compression chamber 82 to the alleged bottom out cup*’ during a compression/downward stroke in Nakaya’s air cylinder apparatus 110 (the reverse of the flow recited in the claim).” PO Resp. 27 (emphasis added). To explain Nakaya’s fluid flow, Patent Owner annotates Figures 7, 8, and 9 from Nakaya, reproduced below:



Annotated Figures 7, 8, and 9 purported demonstrate air flow in Nakaya's apparatus during compression. *Id.* (citing Ex. 2010 ¶ 64). According to

Patent Owner, who relies on Dr. Slocum's testimony, annotated Figures 7–9 demonstrate that fluid does not flow from bottom out cup to the compression chamber at a first rate or a second rate in a compression stroke of the damper. PO Resp. 28–30. Patent Owner further contends that “pressure in compression chamber 821 increases because of the downward motion of piston 113 during a compression stroke and *the resistance to air flow provided by throttle valve 824 in passage 823*. PO Sur-reply 12 (emphasis added). Dr. Slocum explains that

pressure in chamber 821 (upper portion of compression chamber 82) increases because of the downward motion of piston 113 during a compression stroke and the resistance to air flow provided by throttle valve 824 in passage 823. Similarly, pressure in chamber 822 (defined by hole 1127) increases because of the downward motion of projection 1140b in hole 1127 and the resistance to air flow out of chamber 822 provided by throttle valve 140 as air is forced towards rebound chamber 81 through passage 102. But pressure in chamber 821 will still be higher than pressure in chamber 822 because of the larger pressure area covered by piston 113 compared to projection 1140b, and so air will flow from chamber 821 to chamber 822.

Ex. 2010 ¶ 75.

We find Patent Owner's position to be reasonably supported by Nakaya's disclosure and Dr. Slocum's testimony as cited above (*see* Ex. 2010 ¶¶ 64–73) that is based on a detailed review of Nakaya's Figures 7–9 and the accompanying disclosure. For example, Nakaya discloses that “at a stage where the bending degree of the knee is increased and the second chamber 82 is divided into two, the constant throttle valve 140 increases the pressure in the chamber 822 and *the throttle valve 824 increases the pressure in the chamber 821*.” Ex. 1005, 9:25–29 (emphasis added). We find it reasonable that the pressure in chamber 821 may be increased by

the adjustment of throttle 824 rather than by a flow of fluid from middle sized-diameter hole 1127 to chamber 821. This is because Nakaya states throttle valve 824 increases the pressure in chamber 821 and Dr. Slocum has explained in detail, with annotations to Nakaya's Figures 7–9, how a POSITA would understand this to occur in a compression stroke.

Petitioner's arguments otherwise are not persuasive. Petitioner contends that Dr. Slocum's testimony is unsupported. Pet. Reply 14. However, as discussed above, Petitioner's arguments and Dr. Slocum's cited testimony are based on a detailed review and explanation of the embodiment disclosed in Nakaya's Figures 7–9. In contrast, Dr. Wang testifies that

Nakaya, however, contemplates a situation wherein the bottom out cup 1125, 1127 has a more rapidly increasing pressure, and in this context, the fluid (air) will flow from the bottom out cup 1125, 1127 to the compression portion 82.

Ex. 1002 ¶ 56; *see also* Ex. 1003 ¶ 56 (similar testimony by Mr. Wesling). Dr. Wang and Mr. Wesling cite to Nakaya's column 9, lines 22–30 for support. There, as we have discussed, Nakaya does not disclose that the bottom out cup 1125, 1127 has a more rapidly increasing pressure. Ex. 1005, 9:22–30. As we observed, Nakaya teaches that *throttle valve 824* increases the pressure in chamber 821, but does not attribute fluid flow into chamber 821 as the means for increasing pressure. *Id.* at 9:25–29.

Anticipation requires “that the reference describe not only the elements of the claimed invention, but also that it describe those elements arranged as in the claim.” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008) (internal quotations omitted); *see also TF3 Ltd. v. Tre Milano, LLC*, 894 F.3d 1366, 1374 (Fed. Cir. 2018) (“Claims cannot be anticipated by devices that are not the same. Invalidity for anticipation requires that the identical invention must be shown in as complete detail as

contained in the patent claim.” (internal quotations omitted)); *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1343 (Fed. Cir. 2016).

Here, we do not find that Petitioner has met its burden of demonstrating by a preponderance of the evidence that Nakaya describes the required fluid flow direction. Based on the complete record, we determine that Petitioner has not shown by a preponderance of evidence that claim 19 is anticipated by Nakaya.

b) Obviousness

We observe that Dr. Wang’s and Mr. Wesling’s testimonies in paragraph 57 of their respective declarations provide what appears to be proposed modifications of Nakaya. For example, Dr. Wang asserts that

whether or not the fluid flows into the compression portion 82 from the bottom out cup 1125, 1127, or vice versa, depends on a *design choice* for the relative geometries of this region. *A POSITA would have been motivated to try* a plurality of different geometries to produce dampers having slightly different force vs. displacement and/or force vs. velocity curves during a compression stroke.

Ex. 1002 ¶ 57 (emphases added). Dr. Wang adds that adjusting bottom out resistance “would be a matter of mere design choice on which geometries to use.” *Id.*

To the extent that Dr. Wang or Mr. Wesling opines on the obviousness of claim 19, we note that the Petition does not assert or address a modification of Nakaya’s fluid flow path through design choice. Pet. 50–52. Additionally, the Petition affirmatively challenges claims 1–9, 11–15, and 19 on the basis of 35 U.S.C. § 102 based on Nakaya, and separately 35 U.S.C. § 103 based on Nakaya and Kodama. Pet. 3. A portion of

Petitioner's statement of precise relief is reproduced below:

II. STATEMENT OF PRECISE RELIEF REQUESTED FOR EACH CLAIM CHALLENGED

Claims 1-9, 11-15, and 19 are unpatentable under 35 U.S.C. §§ 102 and/or

103. Accordingly, SRAM requests review and cancellation of these Claims.

Grounds	Claims	Prior Art
Ground I	Claims 1-9, 11-15, & 19	Anticipated or Rendered Obvious by <i>Nakaya</i> Alone or in View of <i>Kodama</i>
	a. Claims 1-9, 11-15, 19	Anticipated by <i>Nakaya</i>
	b. Claim 4	Rendered Obvious by <i>Nakaya</i> Alone or in View of <i>Kodama</i>

Pet. 3. To the extent Petitioner relies on obviousness, we determine that an obviousness challenge against claim 19 based on Nakaya alone is also deficient because Petitioner has not adequately explained the basis for this challenge in the Petition. Pet. 50–51; *see* Pet. Reply 13–15.

10. Conclusion

After review of the arguments and evidence, we conclude that Petitioner has established by a preponderance of evidence that claims 1–9 and 11–15 are anticipated by Nakaya. We determine that Petitioner has not established by a preponderance of the evidence that claim 19 is anticipated or rendered obvious by Nakaya.

F. Claims 4 and 8 Obvious over Nakaya and Kodama

1. Claims 4 and 8

For claim 4, Petitioner contends that

[e]ven if Nakaya did not disclose a closed position (which it does), such a feature would have been obvious to a POSITA

using the same equipment featured in Nakaya. A POSITA would have been motivated to provide a closed position to allow for a greater range of damping characteristic for Nakaya's shock absorber 110, including in view of Kodama disclosing a needle valve (Kodama's throttle valve 130) with a closed position.

Pet. 34 (citing Ex. 1005, Fig. 4; Ex. 1006, 4:58–5:2; Ex. 1002 ¶ 94; Ex. 1003 ¶ 93).

For claim 8, Petitioner argues that “it would have been obvious to a POSITA to modify Nakaya to include Kodama's adjustable flow path including Kodama's throttle valve 30 . . . , needle valve 32 . . . , and adjusting screw 34[.]” Pet. 38–39 (citing Ex. 1006, 1:22–56, Figs. 2, 3; Ex. 1002 ¶ 101; Ex. 1003 ¶ 99).

Patent Owner does not address any of Petitioner's arguments regarding these specific limitations beyond what it has presented for claim 1. *See generally* PO Resp., *see generally* PO Sur-reply. Based on the reasoning and evidence provided in the Petition (*see* Pet. 34, 37–39), we determine that Petitioner has demonstrated by a preponderance of evidence that claims 4 and 8 would have been obvious over the combination of Nakaya and Kodama.

G. Remaining Grounds

Petitioner asserts independent claims 1, 11, and 19 and dependent claims 2–5, 9, and 12–15 are anticipated by Chen or would have been obvious over Chen alone or in view of Deferme and Kodama. Pet. 52–76.

Petitioner asserts independent claims 1, 11, and 19 and dependent claims 2–5 and 12–15 would have been obvious over Fox '751 in view of Chen and Kodama. Pet. 76–94.

Petitioner asserts that dependent claims 5–9 would have been obvious over the combination of Fox ‘751, Chen, Nakaya and/or Kodama. Pet. 95–104.

We have determined that Petitioner has shown that:

- Claims 1–5, 9, and 19 are anticipated by Gartner,
- Claim 4 is unpatentable over Gartner and Kodama,
- Claims 1–5, 9, and 11–15 are anticipated by Nakaya, and
- Claims 4 and 8 are unpatentable over Nakaya and Kodoma.
-

We need not reach the remaining challenges. *See SAS Inst. Inc. v. Iancu*, 584 U.S. 357, 371 (2018) (holding a petitioner “is entitled to a final written decision addressing all of the claims it has challenged”); *Boston Sci. Scimed, Inc. v. Cook Grp.*, 809 F. App’x 984, 990 (Fed. Cir. 2020) (non-precedential) (agreeing that the Board has “discretion to decline to decide additional instituted grounds once the petitioner has prevailed on all its challenged claims”).

IV. CONCLUSION

Having reviewed the arguments and the supporting evidence, we determine that Petitioner has shown, by a preponderance of the evidence, that claims 1–5, 9, 11–15, and 19 of the ’223 patent are unpatentable.

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–5, 9, 19	102	Gartner	1–5, 9, 19	
4	103	Gartner, Kodama	4	
1–9, 11–15, 19	102	Nakaya	1–9, 11–15	19
4, 8	103	Nakaya, Kodama	4, 8	

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–5, 9, 11–15, 19 ¹³	102	Chen		
1–5, 9, 11–15, 19 ¹⁴	103	Chen		
1–5, 9, 11–15, 19 ¹⁵	103	Chen, Deferme, Kodama		
1–5, 9, 11–15, 19 ¹⁶	103	Fox '751, Chen, Kodama		
5–9 ¹⁷	103	Fox '751, Chen, Nakaya, Kodama		
Overall Outcome			1–9, 11–15, 19	

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–9, 11–15, and 19 of the '223 patent have been shown to be unpatentable;

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

¹³ As explained above, it was not necessary to reach the unpatentability of claims 1–5, 9, 11–15, 19 in this ground.

¹⁴ As explained above, it was not necessary to reach the unpatentability of claims 1–5, 9, 11–15, 19 in this ground.

¹⁵ As explained above, it was not necessary to reach the unpatentability of claims 1–5, 9, 11–15, 19 in this ground.

¹⁶ As explained above, it was not necessary to reach the unpatentability of claims 1–5, 9, 11–15, 19 in this ground.

¹⁷ As explained above, it was not necessary to reach the unpatentability of claims 5–9 in this ground.

IPR2024-00216
Patent 8,550,223 B2

FOR PETITIONER:

Michael J. Hickey
Michael H. Durbin
LEWIS RICE LLC
mhickey@lewisrice.com
mdurbin@lewisrice.com

FOR PATENT OWNER:

Arpita Bhattacharyya
PERKINS COIE LLP
bhattacharyya-ptab@perkinscoie.com

Joshua L. Goldberg
FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP
joshua.goldberg@finnegan.com