

Patent Owner's Demonstratives

**SRAM, LLC
v.
FOX Factory, Inc.**

**IPR2024-00216
U.S. Patent No. 8,550,223**

Oral Hearing to be held March 7, 2025

U.S. Patent No. 8,550,223



(12) **United States Patent**
Cox et al.

(10) **Patent No.:** US 8,550,223 B2
(45) **Date of Patent:** Oct. 8, 2013

(54) **METHODS AND APPARATUS FOR POSITION SENSITIVE SUSPENSION DAMPENING**

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F16F 9/34 (2006.01)

(52) **U.S. Cl.**
USPC 188/318; 188/322.22

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USPC 188/276, 278, 319.1, 319.2, 322.13, 188/288, 318; 280/275, 276; 251/126; 137/556, 614, 17

See application file for complete search history.

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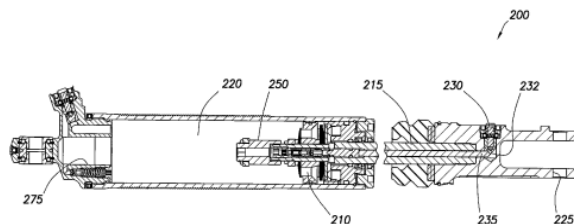
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ABSTRACT

Methods and apparatus for position sensitive dampening. In one aspect a fluid damper is provided comprising a damper chamber divided by a piston into a primary compression and a primary rebound chamber; a secondary compression chamber in fluid communication with the damper chamber; and an adjustable fluid meter controlling fluid flow out of the secondary compression chamber.

19 Claims, 5 Drawing Sheets



METHODS AND APPARATUS FOR POSITION SENSITIVE SUSPENSION DAMPENING

Ex. 1001, Title

(57)

ABSTRACT

Methods and apparatus for position sensitive dampening. In one aspect a fluid damper is provided comprising a damper chamber divided by a piston into a primary compression and a primary rebound chamber; a secondary compression chamber in fluid communication with the damper chamber; and an adjustable fluid meter controlling fluid flow out of the secondary compression chamber.

Ex. 1001, Abstract

U.S. Patent No. 8,550,223: Claims

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, claim 1

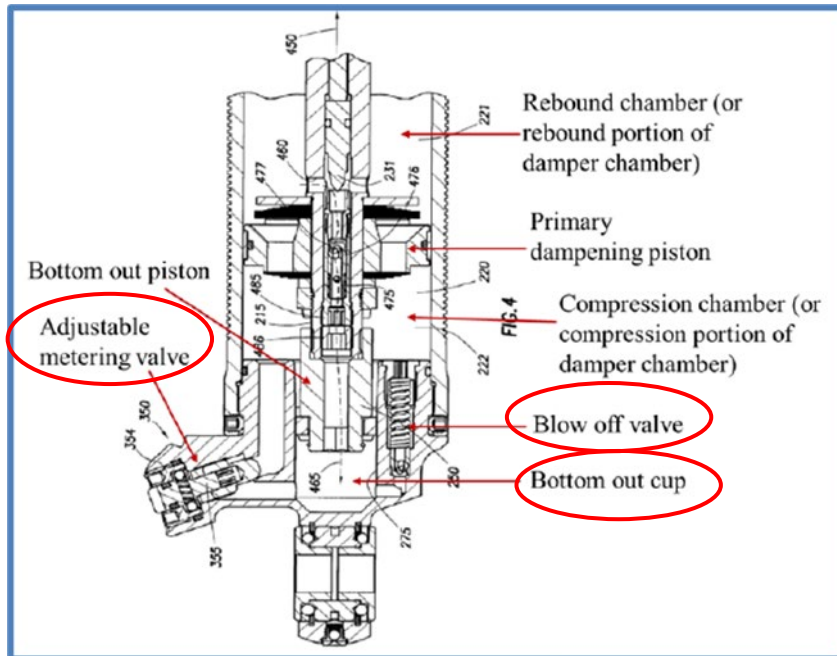
19. A damper for a shock absorber comprising:
a fluid;
a compression chamber;
a bottom out cup;
a valve wherein;
in a compression stroke of the damper, the fluid flows from the bottom out cup to the compression chamber at a first rate with the valve in a first position and at a second rate with the valve 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, claim 19

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, claim 11

Key Features Of The '223 Patent: Bottom Out Cup & Adjustable Fluid Flow Paths



Ex. 2010, ¶ 27 (annotated Fig. 4 of '223 patent)

28. Towards the end of a compression stroke, the bottom out piston enters and seals the bottom out cup, such that most of the fluid cannot exit the cup except through either a fluid flow path that includes a user-adjustable metering valve, or a fluid flow path with a blow off valve that relieves very high pressure. Ex. 1001, 3:40-4:2. When the bottom out piston engages the bottom out cup, dampening is increased because the piston shaft can only progress as dampening fluid (which is generally incompressible) is forced out from the bottom out cup through one of the two flow paths. By regulating the flow of dampening fluid out of the bottom out cup using the metering valve, the effective dampening rate that the shock absorber experiences due

Declaration of Dr. Alexander H. Slocum, Ph.D. (Ex. 2010) at ¶ 28

'223 Patent: Claims 1, 11, and 19

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

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

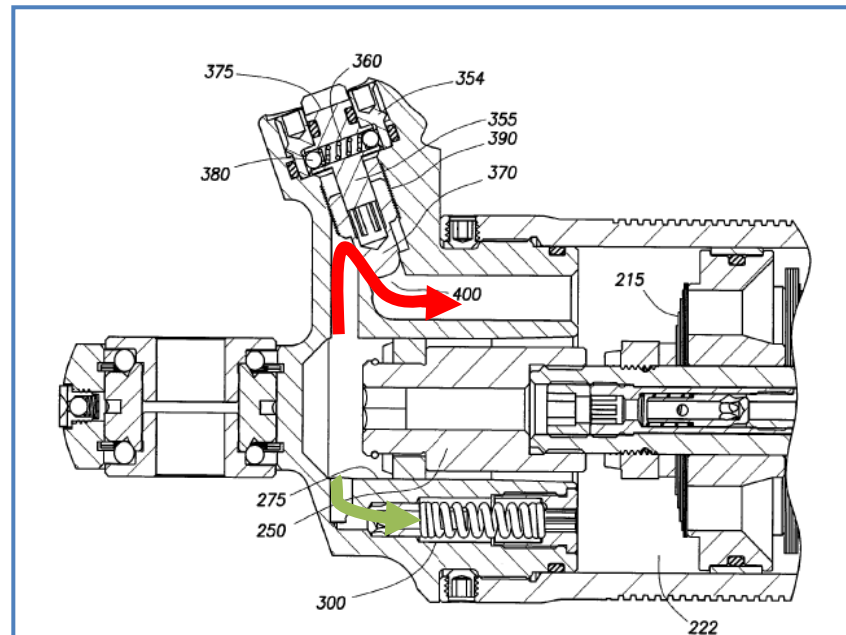
11. A fluid damper comprising:
a damper chamber divided by a piston mounted on a movable rod, into a primary compression and a primary rebound chamber;
a bottom out cup in fluid communication with the damper chamber;
a bottom out piston formed on the movable rod for sealingly engaging an interior of 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

The '223 Patent Teaches Fluid Flow From the Bottom Out Cup to the Compression Chamber

In operation, the blow off valve 300 and the user-adjustable metering valve 350 operate independently of each other but each is designed to permit fluid to pass from the bottom out cup 275 to the compression portion 222 of the chamber 220 in order to lessen the increase in dampening effect (i.e. the "increase" being over that due to the piston 210 and the reservoir 125 during the majority of the compression stroke) when the bottom out piston 250 engages the bottom out cup. Even when valve 350 is completely closed with no fluid entering the compression portion of the chamber through the metering valve 350 (i.e. the bottom out dampening rate is very high), the dampening rate will decrease to some extent when a threshold pressure of blow off valve 300 is reached, thereby opening valve 300 and allowing fluid to flow from the bottom out cup 275 to the compression portion of the chamber 220 via flow path 302 and independently of orifice 400.

Ex. 1001, 5:6-21



Ex. 1001, Fig. 3C (annotated to show fluid flow paths from the bottom out cup to the primary compression chamber)

Overview

○ Claim construction

- “bottom out cup”
- “fluid communication from the cup to the compression portion of the chamber”

○ Ground I: alleged anticipation based on Nakaya

- Nakaya does not disclose the “**damper**” limitation of independent claims 1, 11, and 19
- Nakaya does not disclose fluid flow **from** a bottom out cup **to** a compression chamber as required by independent claims 1 and 19
- Nakaya does not disclose a **second** fluid flow path as required by claim 13

○ Ground II: alleged obviousness based on Chen in view of Deferme

- Chen in view of Deferme does not disclose fluid flow **from** a bottom out cup **to** a compression chamber as required by independent claims 1 and 19
- Chen in view of Deferme does not disclose the “bottom out piston formed on the moveable rod” limitation of independent claim 11
- Chen in view of Deferme does not disclose a **second** fluid flow path as required by claim 13
- There is no motivation to combine Chen and Deferme

Overview (Contd.)

- **Ground III: alleged obviousness based on Fox '751 in view of Chen**
 - Fox '751 in view of Chen does not disclose fluid flow from a bottom out cup to a compression chamber as required by independent claims 1 and 19
 - Fox '751 in view of Chen does not disclose the “bottom out piston formed on the moveable rod” limitation of independent claim 11
 - Fox '751 in view of Chen does not disclose a second fluid flow path as required by claim 13
- **Ground IV: alleged obviousness based on Fox '751 in view of Chen, Nakaya, and Kodama**
 - There is no motivation to combine the asserted references
- **Ground V: alleged anticipation based on Gartner**
 - Gartner fails to disclose a “bottom out cup” as required by claims 1, 11, and 19

Claim Constructions

Claim Construction: “Bottom Out Cup”

- Institution Decision: “we preliminarily construe ‘bottom out cup’ as a ‘cup-shaped feature configured for providing dampening.’” DI at 14.
- Patent Owner: “The term ‘bottom out cup’ should be construed as a ‘cup-shaped feature configured for providing dampening only at the end portion of a compression stroke.’” PO Sur-reply at 3.

37. Nevertheless, the Board’s construction of “bottom out cup” as a “cup-shaped feature configured for providing dampening” may be sufficient to resolve the disputes in this IPR if the construction is clarified to state that the “bottom out cup” provides dampening only at the end portion of a compression stroke.¹ This 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 compression stroke. Ex. 1001, 1:65-2:9, 2:22-26. Without this clarification even the primary compression chamber of a damper could be referred to as a “bottom out cup” because damper chambers are typically cup-shaped and are configured for providing dampening.

Declaration of Dr. Alexander H. Slocum, Ph.D. (Ex. 2010) at ¶37

POR, 8-11

Claim Construction: “Bottom Out Cup”

- Petitioner’s experts and Patent Owner’s expert agree that the “bottom out cup” provides dampening **only near the end of a compression stroke**

Q. Okay. The bottom out cup is a chamber or a volume where some compression happens during a compression stroke in the shock absorber, correct?

A. At the end of the compression stroke, at some point when you're almost fully compressed, that cup, yeah, is a chamber, like you say. Or a volume of oil.

Deposition of SRAM’s expert, Mr. Wesling (Ex. 2011), 18:18-19:2

Indeed, as explained by Patent Owner’s expert, “the bottoming out cup is a bottoming out cup when it actually starts providing dampening, and that, as one skilled in the art, understands that only happens when you have the cup-shaped feature where this secondary piston starts to enter it, now it starts providing dampening” which happens “near end of stroke.” Ex. 1020, 72:3-21, 74:14-75:2; *see also id.* at 47:10-23, 76:17-78:17. Petitioner’s experts also agree that the “bottom out cup” provides

Sur-Reply, 4 (quoting testimony by FOX’s expert, Dr. Slocum (Ex. 1020))

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.

Deposition of SRAM’s expert, Dr. Wang (Ex. 2012), 16:3-19

Sur-Reply, 3-6

Claim Construction: “Fluid Communication From The Cup To The Compression Portion Of The Chamber” (Claim 1)

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, claim 1

VS

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.

from the cup to the compression portion of the chamber.” A POSITA will understand that fluid communication from the bottom out cup to the compression portion of the damper chamber requires some fluid to flow from the cup to the compression portion. If 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. SRAM’s interpretation of the limitation “fluid communication from the cup to the compression portion of the chamber” as having no directionality reads the words “from” and “to” out of the claims and improperly inserts the word “between” there (as in claim 11). I thus disagree with SRAM and its experts that the above limitation of claim 1 only requires fluid flow in either direction between the cup and the compression portion of the chamber. Instead, a POSITA will 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.

Declaration of Dr. Alexander H. Slocum, Ph.D. (Ex. 2010) at ¶40

Ex. 1001, claim 11

Sur-Reply, 6-8

Petitioner's Ground I: Alleged Anticipation Based on Nakaya

The '223 Patent Claims Are Not Anticipated By Nakaya

- Petitioner alleges anticipation for claims 1-9, 11-15, and 19
 - Petitioner asserts Kodama for an obviousness allegation against dependent claims 4 and 8
- Nakaya does not anticipate claims 1-9, 11-15, and 19
 - Nakaya does not disclose a “damper,” as required by independent claims 1, 11, and 19
 - Nakaya does not disclose fluid flow from a bottom out cup to a compression chamber, as required by independent claims 1 and 19
 - Nakaya does not disclose a second fluid flow path between a bottom out cup and a primary compression chamber, as required by claim 13

Nakaya Does Not Disclose The “Damper” Limitation Of Independent Claims 1, 11, And 19

- **Nakaya’s prosthetic apparatus is an energy storage device**, which is functionally opposite of a damper. Sur-Reply 9-11; Ex. 2010, ¶¶ 55-62
- A POSITA would not consider Nakaya’s prosthetic apparatus a “damper” because dampers dissipate energy to cushion impact, which would contradict Nakaya’s purpose of energy storage and return. Ex. 1005, 1:6-30; Ex. 2010, ¶¶ 56, 59
- Nakaya’s prosthetic apparatus is essentially a spring, with very minimal amount of damping to avoid oscillation. Sur-Reply, 10

Petitioner does not disagree that Nakaya’s “various restrictions” will only cause minimal dampening, or that Nakaya is mainly an energy storage device, but argues nevertheless that Nakaya is a “damper.” Reply, 7-8. But according to the “second law of thermodynamics,” every apparatus, including Nakaya, provides some dampening, but that does not qualify Nakaya as a “damper” because the “intent of [Nakaya] is energy storage and return, so to aid in walking.” Ex. 1020, 90:22-91:13. Patent Owner’s expert acknowledges that the Nakaya apparatus will have some “losses” of energy, and in fact, if there was “absolutely zero damping and it was [an] idealistic pure mechanical spring, you couldn’t walk” because the prosthetic will act as “an oscillator.” *Id.* at 99:11-101:7. However, “the damping level is typically a couple percent at most,” i.e., “just enough so you don’t oscillate your leg.” *Id.*; *see also id.* at 106:7-107:8. In contrast, the energy dissipated by a “damper” for a shock absorber is “typically on the order of tens of percent.” *Id.* at 107:9-109:24. The Nakaya apparatus is therefore not a “damper.” *See id.*

PO Sur-Reply at 10

POR, 12-15, 22-26; Sur-Reply, 9-11

Nakaya's Prosthetic Device Is Not A Damper

55. Independent claims 1, 11, and 15 recite a “damper” having, among other things, a bottom out cup and a compression chamber (or a compression portion in the damper chamber). A POSITA would understand that 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. The Nakaya apparatus is not a “damper,” nor can it be used as such, because it is not intended to dissipate energy which is an essential characteristic of a “damper.” Accordingly, Nakaya fails to disclose a “damper” as required by independent claims 1, 11, and 19.

56. Specifically, the Nakaya apparatus is a spring-like bi-directional system meant to assist the bending and stretching motion of an amputee's knee, and to aid in the forward motion of a prosthetic limb, i.e., to propel walking. Ex. 1005, 1:6-13, Title, Abstract. Unlike Nakaya's apparatus, a “damper” is not intended to propel the vehicle; rather, it is intended to cushion hard landings and bumps by dissipating energy. Thus, the Nakaya apparatus is the opposite of a “damper,” which is intended to dissipate energy (not store it).

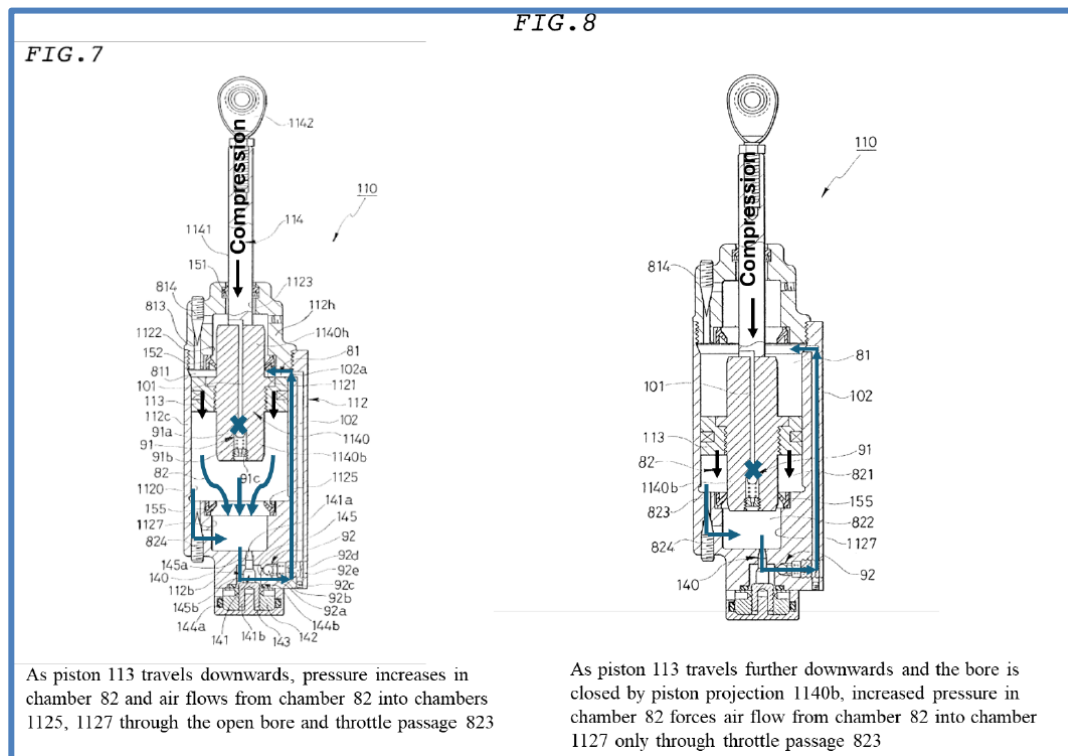
Ex. 2010, ¶¶ 55, 56

59. A POSITA would understand that the air-based system taught by Nakaya is to assist the user while walking or running. Ex. 1005, 1: 6-13. Indeed, Nakaya teaches that the system is designed to help “the wearer of the prosthetic limb [to] walk with a feeling of natural walking without a sense of incompatibility.” Ex. 1005, 3:60-62. If Nakaya was a “damper,” then the user would strain to walk as it would feel like walking or running in loose sand. Nakaya would thus not work as a “damper.” “Dampers” generally use oil and a special arrangement of chambers and metered passages to dissipate large amounts of energy generated and do not need to store energy to help propel the user forward. For example, when a bicycle rider races down a trail with many bumps, the majority of the energy from the mass of the rider and bike impacting the ground must be dissipated, and only a small amount is needed to rebound the device. Nakaya's air-spring apparatus is not a “damper,” much less a “damper” intended for use in a shock absorber. If Nakaya were to be reconfigured as a “damper,” a user would feel like they were running in sand, which is not the function of a prosthetic limb.

Ex. 2010, ¶ 59

Nakaya Does Not Disclose Fluid Flow From “Bottom Out Cup” To Compression Chamber As Required By Claims 1 And 19

- In Nakaya, air flows from compression chamber 821 to chamber 822 (alleged “bottom out cup”) during a compression stroke (not the other way)



Ex. 2010, ¶ 57 (Ex. 1005, annotated Figs. 7-8)

POR, 27-33; Sur-Reply, 11-12

Nakaya Does Not Disclose Fluid Flow From “Bottom Out Cup” To Compression Chamber

mm². At a stage where the bending degree of the knee is small and the second chamber 82 is not yet divided into two, the constant throttle valve 140 generates a torque necessary for increasing the pressure in the second chamber 82. On the other hand 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. FIG. 10 is a graph showing one example of pressure characteristics in the air-cylinder apparatus 110 in which the bending angle of the knee is plotted along the abscissa and the pressure generated in the second chamber 82 or torque attributable to the generation of the pressure is plotted along the ordinate. As shown in the characteristics chart of FIG. 10, the air-cylinder apparatus 110 exhibits very smooth characteristics.

Ex. 1005, 9:24-29

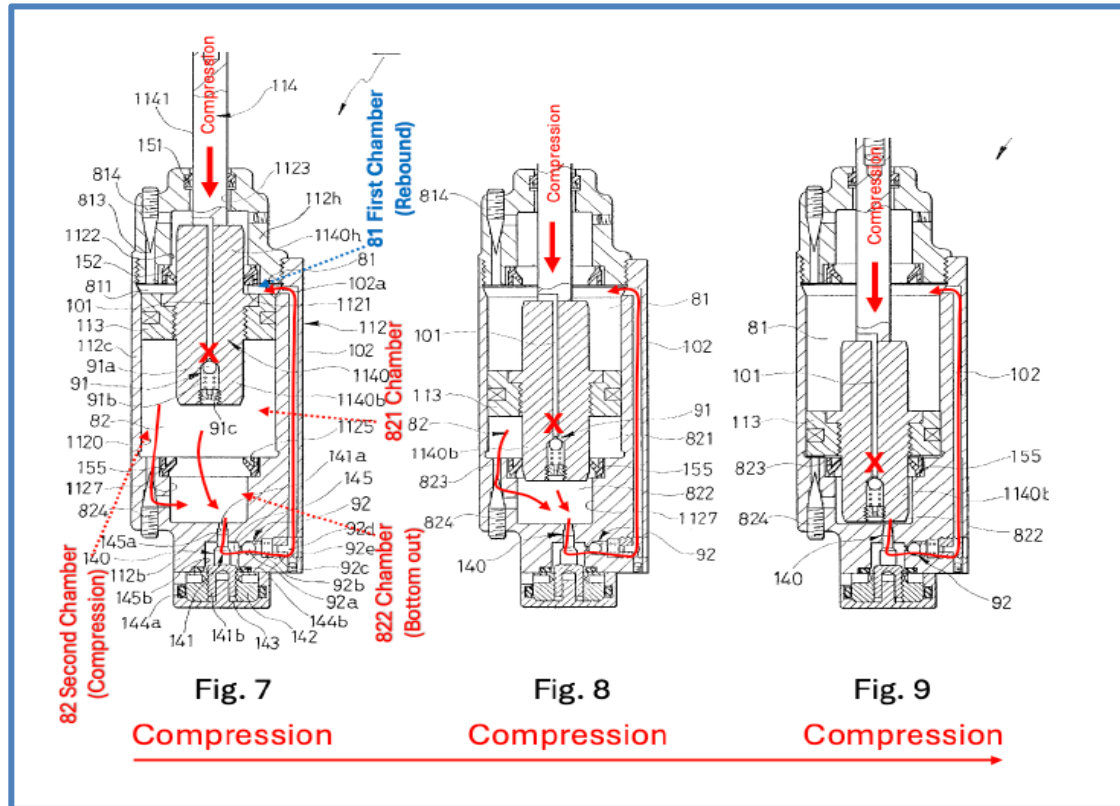
76. In fact, Nakaya notes that as the bending degree of the knee increases, i.e., the piston 113 compresses, throttle valve 140 “increases the pressure in chamber 822,” and yet it is clear from Nakaya’s disclosure that air flows out of chamber 822 through throttle valve 140 to chamber 81. *See* Ex. 1005, 7:41-56, 8:27-33, 9:22-30. In other words, air does not have to flow into a chamber (e.g., chamber 821) to increase pressure therein; rather, the pressure in a chamber increases because of the downward motion of the piston and the resistance to air flow provided by the throttle valves 824. As such, air flows out of chamber 821 into chamber 822 because of the increased pressure in chamber 821. That is, increased pressure determines the direction of flow; air does not flow into a chamber “to increase pressure” as incorrectly noted by the Board.

Ex. 2010 at ¶ 76

Petitioner’s argument that “air in the bottom out cup moves into the compression portion during a compression stroke of the damper, thereby increasing the pressure in the compression portion” is incorrect. Reply, 13 (emphasis added). As Petitioner’s expert, Dr. Wang, testified: “the direction of flow depends on the pressure differential” and “flow doesn’t increase pressure”; rather, “[p]ressure creates the flow.” Ex. 2012, 123:5-124:9. That is, the increased pressure in compression chamber 821 is not due to the flow of air into that chamber because “flow doesn’t increase pressure.” *See id.*; Ex.

PO Sur-Reply at 11-12

Nakaya Does Not Disclose Fluid Flow From “Bottom Out Cup” To Compression Chamber



Ex. 2010 at ¶ 64

A. I think they've put the cart before the horse in some ways. I mean, the direction of flow depends on the pressure differential. So, you know, flow doesn't increase pressure. Pressure creates the flow.

Deposition testimony of Petitioner's expert Eric Wang, Ph.D.
(Ex. 2012) at 124:5-9

Nakaya Does Not Disclose a Second Fluid Flow Path As Required By Claim 13

- Claims 11 and 13 of the '223 patent disclose two separate fluid flow paths. Ex. 1001 at 8:8-30

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 at 8:8-23

13. 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.

Ex. 1001 at 8:27-30

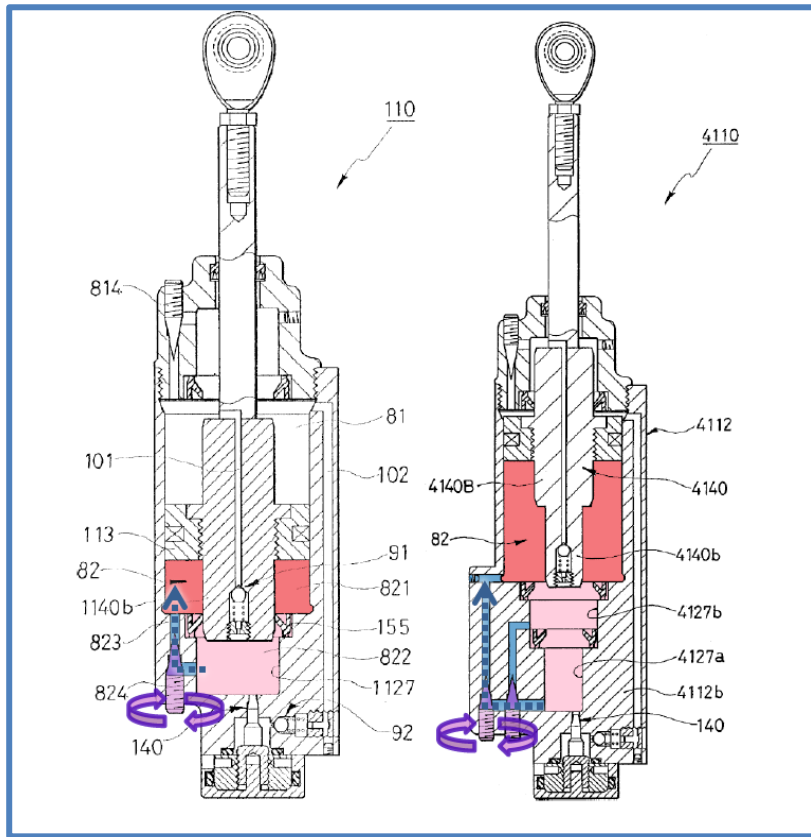
Claim 13: The damper of claim 12, further including a fluid flow path formed between the cup and the primary compression chamber; wherein the capacity of the fluid flow path is adjustable.

168. Using either Party's proposed claim constructions, the Accused Shocks do not infringe claim 13 because the Accused Shocks do not include a second adjustable fluid flow path (so there cannot be a "further ... flow path formed"). Claim 13 requires a second fluid flow path "wherein the capacity of the fluid flow path is adjustable" in addition to "an adjustable fluid flow path formed in the cup" required by claim 13.

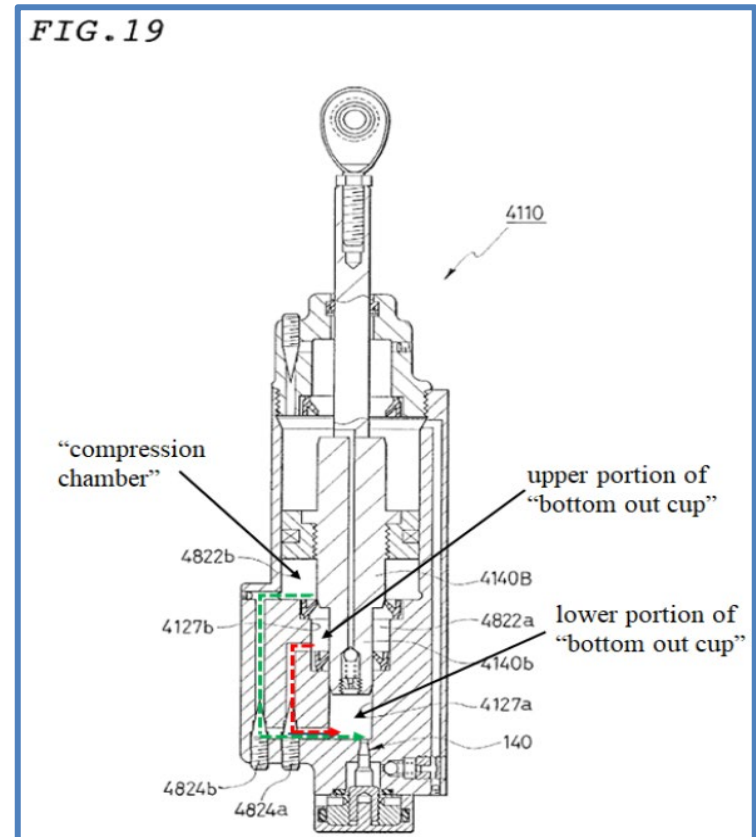
Ex. 2013 (Non-Infringement Report of Petitioner's Expert) at ¶ 168

Nakaya Fails to Disclose A Second Fluid Flow Path As Claimed In Claim 13

- Petitioner maps the same flow path of Nakaya to the two separate flow paths of claims 11 and 13



Compare Pet., 46, with Pet., 49



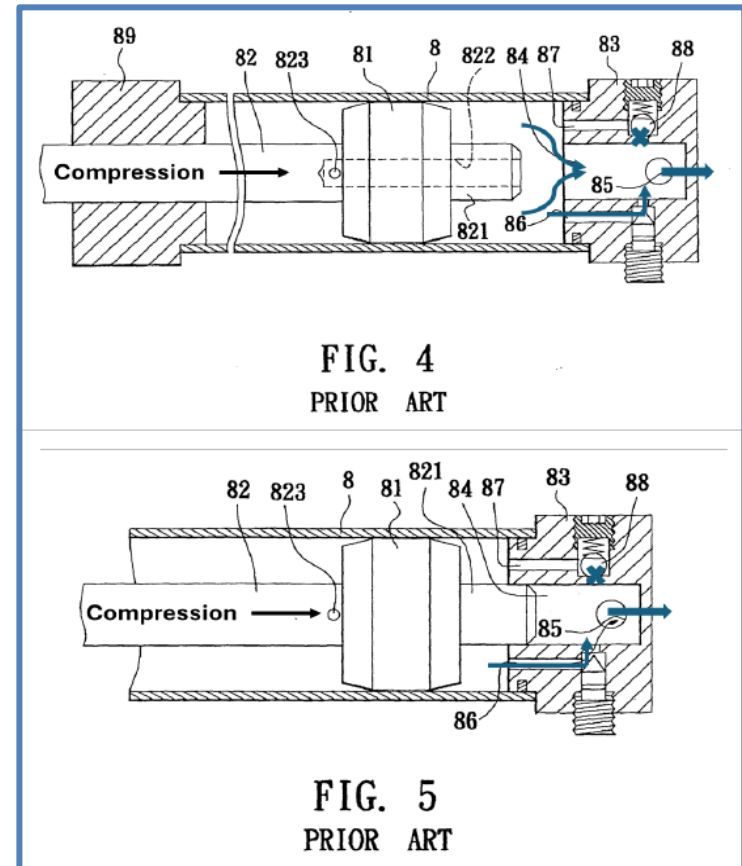
PO Sur-Reply at 15

POR, 33-40; Sur-Reply, 12-15

Petitioner's Ground II: Alleged Anticipation of Claims 1-5, 9, 11-15, and 19 by Chen, or Obviousness Based on Chen Alone or in View of Deferme

Chen Does Not Disclose Fluid Flow From “Bottom Out Cup” To Compression Chamber As Required By Claims 1 And 19

- Fluid flows from Chen’s hydraulic cylinder 8 to accommodating cavity 84 (alleged “bottom out cup”) through flow way 86 during a compression stroke. Ex. 1007, 1:20-26
- Board agreed that when Chen’s projecting post 821 fits into accommodating cavity 84 during compression, “oil in hydraulic cylinder 8 can flow through the small diameter flow way 86 into accommodating cavity 84 and out oil outlet 85.” DI, 43 (emphasis added)



Ex. 2010 at ¶ 84 (annotated Figs. 4-5 from Ex. 1007)

POR, 41-45; Sur-Reply, 16-17

Chen in View of Deferme Does Not Disclose Fluid Flow From “Bottom Out Cup” To Compression Chamber

- Deferme only teaches a piston with bidirectional flow between the compression and rebound chambers. Ex. 2010, ¶87
- Flow through Deferme’s piston cannot be equated to flow from Chen’s accommodating cavity 84 to hydraulic cylinder 8; rather, any fluid flow through the piston will be between cavity 84 and the rebound chamber. Ex. 2010, ¶88
- Flow through Deferme’s piston is not adjustable. Ex. 2010, ¶89

88. First, nowhere does Deferme disclose flow of fluid or fluid communication between a “bottom out cup” and a compression chamber; rather, Deferme simply teaches flow of fluid between the compression and rebound chambers and provides no motivation to do otherwise. Ex. 1008, ¶¶[0030]-[0033]. Specifically, even if Chen’s piston 81 was replaced by or modified in view of Deferme’s piston, SRAM’s experts do not explain how oil from Chen’s accommodating cavity 84 (alleged “bottom out cup”) would flow through Chen’s projecting post 821 and piston 81 (modified in view of Deferme) into the compression portion of cylinder 8. Both experts simply say that there would be a period of time when the fluid (oil) would flow from the bottom out cup 84 to the compression portion, but provide no explanation of how that would happen. Ex.

Ex. 2010 at ¶ 88

Petitioner Provides No Motivation to Modify Chen , Or Combine Chen And Deferme

- Petitioner does not explain **why or how** Chen would have been modified with or without Deferme

Deferme, which Petitioner cites only with regard to a piston with bidirectional flow between the compression and rebound portions of the damper, does not overcome Chen's deficiency. Ex. 2010, ¶¶87-89. Petitioner's conclusory "design choice" and "motivated to try" reply arguments also do not cure the deficiencies of Chen, or Chen in view of Deferme, because Petitioner has not explained how or why one skilled in the art would change geometries or reverse the flow paths of Chen to allow fluid to flow from accommodating cavity 84 (alleged "bottom out cup") to the compression portion of hydraulic cylinder 8. Reply, 26; *but see Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1373, 1374 n.3 (Fed. Cir. 2008) (requiring "explanation as to how or why the references would be combined to produce the claimed invention."). Without any explanation of the motivation and reasonable expectation of success for modifying Chen to reverse the flow directions, Petitioner's obviousness arguments amount to mere speculation and an impermissible hindsight reconstruction of the claimed invention.

PO Sur-Reply at 17-18

POR, 51-52

Chen Does Not Disclose “Bottom Out Piston Formed On The Moveable Rod” As Required By Claim 11

- Post 821 (alleged “bottom out piston”) is an extension of main piston 81; it is not formed on movable rod 82

95. Chen discloses a hydraulic cylinder 8 having a piston 81 connected to a movable rod 82. Ex. 1007, 1:5-9, 1:18-20. Piston 81 has a projecting post 821 extending towards the front end of hydraulic cylinder 8. Ex. 1007, 1:5-8 (“One end of the piston 81 of the hydraulic cylinder 8 opposite to the piston or rod 82 has a projection post 821.”). SRAM’s experts incorrectly refer to projecting post 821 as a “bottom out piston formed on the movable rod.” Post 821 is an extension of the main piston 81; it is not formed on the movable rod 82. In fact, it has no connection to rod 82; it simply extends from piston 81. Accordingly, Chen does not disclose or suggest a “bottom out piston formed on the movable rod [on which the main piston is mounted],” as required by claim 11. Deferme does not disclose or suggest a bottom out piston and therefore does not overcome this deficiency of Chen. Nor have SRAM’s experts relied on Deferme for such a teaching.

Ex. 2010 at ¶ 95

Fig. 4 of the accompanying drawings shows a conventional all-liquid single-acting hydraulic cylinder 8. One end of the piston 81 of the hydraulic cylinder 8 opposite to the piston or rod 82 has a projecting post 821. The cap 83 at the front end of the hydraulic cylinder 8 is formed with an accommodating cavity 84 cooperating with the projecting post 82. The accommodating cavity 84 communicates with an oil outlet 85. The cap 83 is further formed with two small diameter flow ways 86, 87 which also communicate with the oil outlet 85. A check ball valve 88 is disposed in one flow way 871 whereby the oil can only flow one-way therethrough during the forward stroke of the piston 81.

Ex. 1007 at 1:5-13

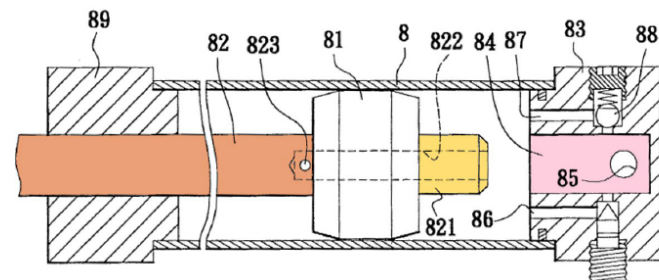


FIG. 4

Pet., 69

Neither Chen Alone, Nor In Combination With Deferme, Disclose A Second Fluid Flow Path As Required By Claim 13

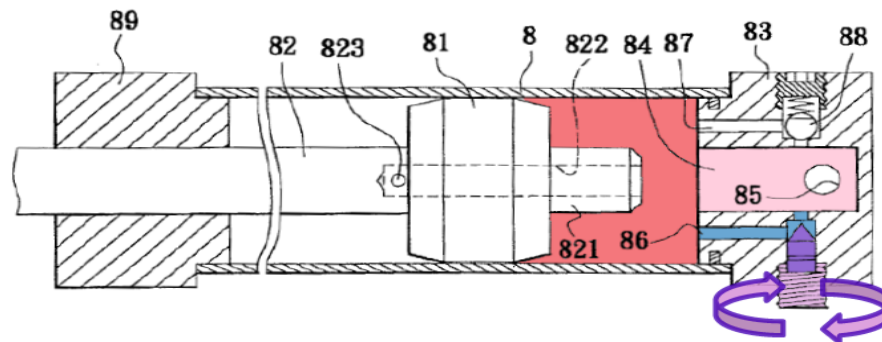
11. A fluid damper comprising:

- 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.

13. 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.

- Petitioner maps the **same fluid flow path of Chen (flow way 86)** to both the “adjustable fluid flow path” of claim 11 and the additionally claimed “fluid flow path” of claim 13 to the same path in Chen
- This is erroneous under *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) and similar cases



Compare Pet., 71, with Pet., 73

POR, 53-55; Sur-Reply, 19

Petitioner's Ground III: Alleged Obviousness of Claims 1-5, 9, 11-15, and 19 Based on Fox '751 in View of Chen

Fox '751 In View Of Chen Does Not Render Claims 1-5, 9, 11-15, And 19 Obvious

- Fox '751 teaches a “typical damper for a shock absorber” that does not include a “bottom out cup.” Pet., 76-78
- **The Petition relies entirely on Chen for its alleged disclosure of a “bottom out cup” and related flow paths**
- But Chen does not disclose:
 - Fluid flow **from** a “bottom out cup” **to** a compression chamber, as required by claims 1 and 19
 - A “bottom out piston **formed on** the moveable rod,” as required by claim 11
 - **Two separate and distinct fluid flow paths** between Chen’s compression chamber and the alleged “bottom out cup”
- Fox '751 does not overcome these deficiencies of Chen because Fox '751 does not disclose a “bottom out cup”

POR, 55-56; Sur-Reply, 19-20

Petitioner's Ground IV: Alleged Obviousness of Claims 5-9 Based on Fox '751 in View of Chen and Further in View of Nakaya and/or Kodama

No Motivation To Combine Fox '751 And Chen With Nakaya And/Or Kodama

- Nakaya and Kodama are air-based prosthetic devices, whereas Chen and Fox '751 are oil-based shock absorbers
- Petitioner offers no explanation of how or why these two different systems would have been combined
- There is no benefit in modifying Chen (or Fox '751 in view of Chen) because Chen already has adjustable rebound flow through axial hole 121 and vents 13, 14.
Ex. 2010, ¶ 103

102. SRAM's expert Dr. Wang and Mr. Wesling opine that the limitations of claims 5-9 are separately taught by Nakaya and/or Kodama and that a POSITA would have combined Chen, or Fox '751 in view of Chen, with Nakaya/Kodama to arrive at claims 5-9 (although the Petition notes Ground IV as Fox '751 in view of Chen and further in view of Nakaya/Kodama). Ex. 1002, ¶¶ 168-176; Ex. 1003, ¶¶ 163-171. But SRAM's experts fail to provide sufficient motivation and a reasonable expectation of success for the proposed combination. Fox '751 and Chen discuss a conventional damper for a shock absorber and a hydraulic cylinder, respectively, and they both use hydraulic fluid (oil), whereas Nakaya and Kodama are air-based prosthetic devices. Neither Dr. Wang nor Mr. Wesling explain how the oil-based systems of Chen and Fox '751 may be combined with the air-based system of Nakaya or Kodama. A POSITA would have understood that such a combination would require substantial modifications of the Chen and Fox '751 devices, which neither Dr. Wang nor Mr. Wesling have explained how to do.

Ex. 2010, ¶ 102

POR, 56-58

No Reasonable Expectation Of Success In Modifying Fox '751 And Chen To Have Elements From Nakaya/Kodama

- Petitioner has not explained how elements of Nakaya/Kodama will work alongside or in conjunction with hole 121 and vents 13, 14 of Chen's hydraulic cylinder
- The combination of Chen (or Fox '751 in view of Chen) with Nakaya/Kodama would render Chen's existing buffer mechanism for rebound travel inoperable and/or impractical. Ex. 2010, ¶ 103

103. Except for impermissible hindsight, I do not see a reason (nor have Dr. Wang or Mr. Wesling provided any reason) why a POSITA would have been motivated to modify Fox '751 in view of Chen to have adjustable flow through the piston rod/shaft of Chen because Chen already teaches a mechanism for adjusting rebound flow and achieving a buffer effect during rebound using an axial hole 121 through Chen's piston rod and vents 13, 14 extending radially through the piston rod. Ex. 1007, Abstract, 2:9-20, 3:4-26. Again, Chen is a "buffer structure for a hydraulic cylinder," and not a damper. A hydraulic cylinder is an actuator powered by an external pump and controlled by external valves, and not used as a shock absorber or on vehicle suspension systems. SRAM's experts have provided no explanation how the elements of Nakaya/Kodama will work alongside or in conjunction with hole 121 and vents 13, 14 of Chen's hydraulic cylinder. Nor have SRAM's experts explained the benefits of combining Nakaya/Kodama with Chen (or Fox '751 in view of Chen) when Chen already discloses adjustment of rebound flow. In my opinion, the combination of Nakaya/Kodama with Chen, or Fox '751 in view of Chen, will impede Chen's buffer mechanism for the rebound travel of the piston and render it inoperable and/or impractical. Accordingly, a POSITA would not have been motivated to combine Chen, or Fox '751 in view of Chen, with Nakaya/Kodama, nor would a POSITA have reasonably expected success in doing so. Rather, a POSITA would have been satisfied with the rebound flow adjustment mechanism of Chen. Accordingly, claims 5-9 are not rendered obvious by Chen, or Fox '751 in view of Chen, and further in view of Nakaya or Kodama.

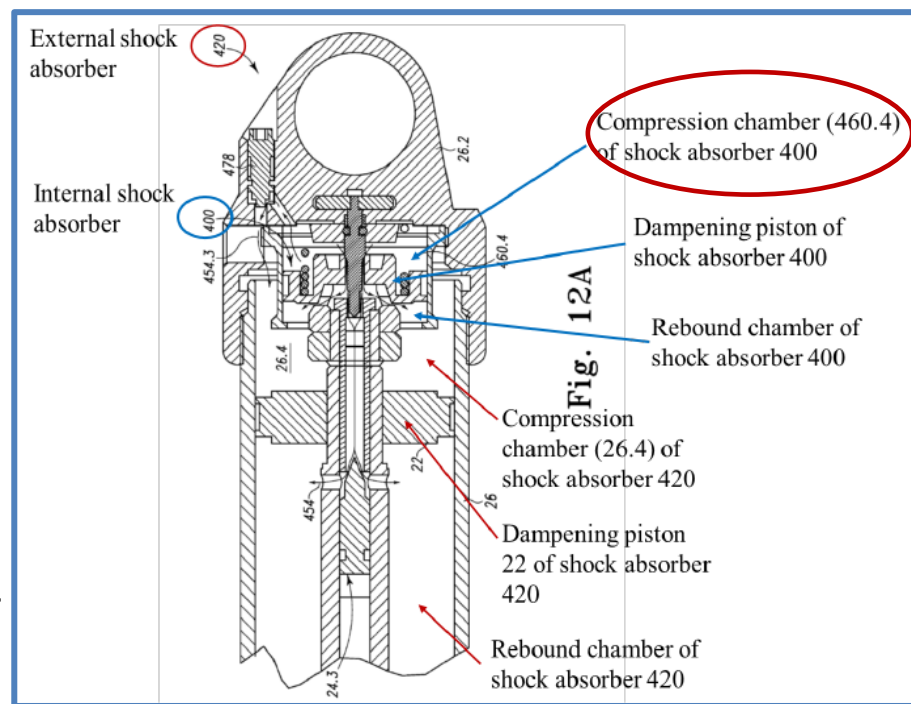
Ex. 2010, ¶ 103

POR, 56-58

Petitioner's Ground V: Alleged Anticipation of Claims 1-5, 9, and 19 Based on Gartner

Gartner Does Not Anticipate Claims 1-5, 9, and 19

- Petition alleges independent claims 1 and 19 are anticipated by Gartner
- But Gartner does not disclose a “bottom out cup” as required by claims 1 and 19
- Gartner’s **compression volume 460.4 is the compression chamber of internal shock absorber 400**, which is placed within external (main) shock absorber 420
 - Shock absorbers 420 and 400 of Gartner are “two shock absorbers in series.” Ex. 1020, 154:3-18
 - Compression volume 460.4 cannot be a “bottom out cup” because it is the compression chamber of shock absorber 400



Ex. 2010, ¶ 105

Gartner Does Not Anticipate Claims 1-5, 9, and 19 (Contd.)

- “Bottom out cup” should be construed as a “cup-shaped feature configured for providing dampening only **at the end portion of a compression stroke**”
- Gartner does not disclose internal shock absorber 400, or its compression volume 460.4, is activated at the end portion of a compression stroke
- In fact, **Petitioner admits that Gartner’s compression volume 460.4 provides “some level of damping” throughout the compression stroke**, not just in the final stages of compression. *See* Reply, 28

Furthermore, Gartner does not anticipate claims 1 and 19 because element 460.4 (or 460) does not meet the correct construction of “bottom out cup.” As discussed in the Patent Owner Response and herein, “bottom out cup” should be construed as “cup-shaped feature configured for providing dampening only at the end portion of a compression stroke.” But as admitted by Petitioner, compression volume 460.4 (or purported cylinder 460) of Gartner will “provide *some level of damping anytime fluid flows though [sic] it*, which will occur to some extent during the entire compression stroke because fluid will move into the reservoir on the left side of *Gartner’s* Figure 12A.” Reply, 28 (emphasis in original). Thus, if the Board agrees with Patent Owner’s construction of “bottom out cup,” then Gartner does not anticipate the challenged claims because compression volume 460.4 (or purported cylinder 460) of Gartner provides some dampening throughout the compression stroke (not just in the final stages of compression) as admitted by Petitioner.

Sur-Reply at 24

POR, 60, Sur-Reply, 24

Claim 4 is Not Rendered Obvious By Gartner in View of Kodama

- Claims 6-8 and 11-15 are not challenged under Ground V based on Gartner
- Petitioner asserts obviousness of only claim 4 based on Gartner in view of Kodama
- Kodama does not disclose a “bottom out cup” and therefore does not overcome the deficiency of Gartner
- Accordingly, claim 4 is not rendered obvious by Gartner in view of Kodama