

Petitioner SRAM's Demonstrative Exhibits

PTAB Hearing for
IPR2024-00216

Inter Partes Review of
U.S. Patent No. 8,550,223

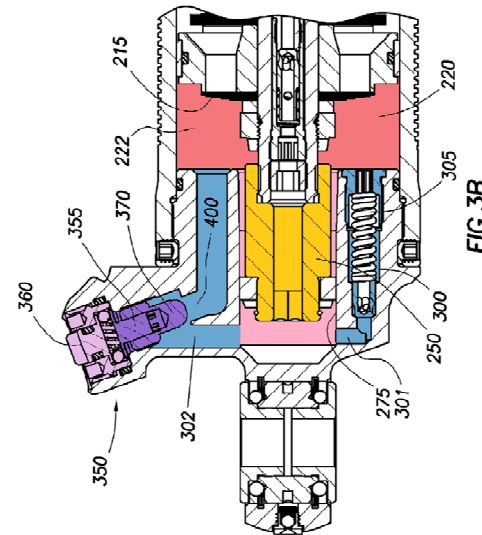
March 7, 2025

(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	(56) References Cited U.S. PATENT DOCUMENTS	
(75) Inventors: Christopher Paul Cox, Freedom, CA (US); Everet Owen Erickson, Santa Cruz, CA (US); Wesley E. Allinger, Santa Cruz, CA (US)	2,363,867 A * 11/1944 Isely 188/289 2,518,553 A * 8/1950 Kieber 137/516.23 2,924,304 A * 2/1960 Patriquin 188/288 3,127,958 A * 4/1964 Szostak 188/275 3,175,645 A * 3/1965 Schafer et al. 3,795,291 A * 3/1974 Naito et al. 188/274 4,045,008 A * 8/1977 Bauer 267/120 4,311,302 A * 1/1982 Heyer et al. 4,732,244 A * 3/1988 Verkeylen 188/318 5,634,653 A * 6/1997 Browning 280/276 5,810,128 A * 9/1998 Eriksson et al. 188/289 5,833,036 A * 11/1998 Gillespie 188/285 6,029,958 A * 2/2000 Larson et al. 267/113 6,120,049 A * 9/2000 Gonzalez et al. 280/276 6,296,092 B1 10/2001 Marking et al. 6,318,525 B1 * 11/2001 Vignocchi et al. 188/319.2 6,446,771 B1 * 9/2002 Sinton et al. 188/288 6,659,241 B2 * 12/2003 Sendra 188/314 6,966,412 B2 * 11/2005 Braswell et al. 188/286 7,513,490 B2 * 4/2009 Robertson 267/64.15	
(73) Assignee: Fox Factory, Inc., Scotts Valley, CA (US)	* cited by examiner Primary Examiner — Christopher Schwartz (74) Attorney, Agent, or Firm — Patterson & Sheridan, L.L.P.; David M. Haugen	
(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.	(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.	
(21) Appl. No.: 12/463,927	19 Claims, 5 Drawing Sheets	
(22) Filed: May 11, 2009		
(65) Prior Publication Data US 2009/0277734 A1 Nov. 12, 2009		
Related U.S. Application Data		
(60) Provisional application No. 61/052,150, filed on May 9, 2008.		
(51) Int. Cl. F16F 9/34 (2006.01)		
(52) U.S. Cl. USPC 188/318; 188/322.22		
(58) Field of Classification Search 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.		

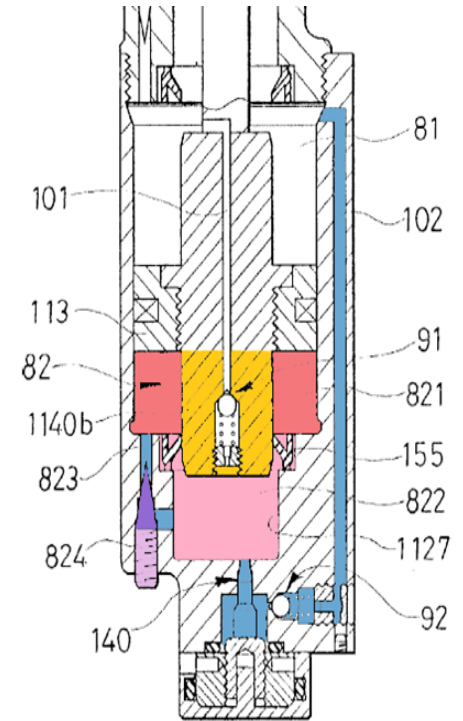
'223 patent (Ex. 1001), cover page

Argument Overview

- Background of the '223 patent
- Summary of invalidating prior art
- Expert testimony, documentary evidence, and claim construction
- Unpatentability of challenged claims



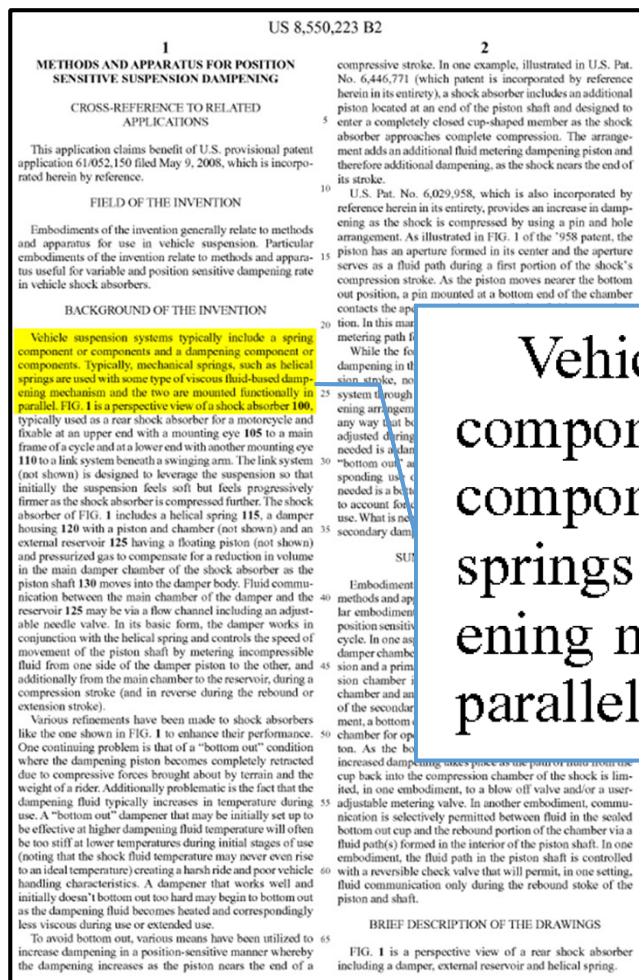
'223 Patent



Nakaya Prior Art

'223 patent (Ex. 1001) at FIG. 3B; Nakaya (Ex. 1005) at FIG. 8

The '223 patent admits prior art dampers



Vehicle suspension systems typically include a spring component or components and a dampening component or components. Typically, mechanical springs, such as helical springs are used with some type of viscous fluid-based dampening mechanism and the two are mounted functionally in parallel. FIG. 1 is a perspective view of a shock absorber 100,

'223 patent (Ex. 1001) at 1:21-48

The '223 patent admits "bottom out" condition

US 8,550,223 B2

1
METHODS AND APPARATUS FOR POSITION SENSITIVE SUSPENSION DAMPENING

2
CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims benefit of U.S. provisional patent application 61/052,150 filed May 9, 2008, which is incorporated herein by reference.

FIELD OF THE INVENTION

Embodiments of the invention generally relate to methods and apparatus for use in vehicle suspension. Particular embodiments of the invention relate to methods and apparatus useful for variable and position sensitive dampening rate in vehicle shock absorbers.

BACKGROUND OF THE INVENTION

Vehicle suspension systems typically include a spring component or components and a dampening component or components. Typically, mechanical springs, such as helical springs are used with some type of viscous fluid-based dampening mechanism and the two are mounted functionally in parallel. FIG. 1 is a perspective view of a shock absorber 100, typically used as a rear shock absorber for a motorcycle and fixable at an upper end with a mounting eye 105 to a main frame of a cycle and at a lower end with another mounting eye 110 to a link system beneath a swinging arm. The link system (not shown) is designed to leverage the suspension so that initially the suspension feels soft but feels progressively firmer as the shock absorber is compressed further. The shock absorber of FIG. 1 includes a helical spring 115, a damper housing 120 with a piston and chamber (not shown) and an external reservoir 125 having a floating piston (not shown) and pressurized gas to compensate for a reduction in volume in the main damper chamber of the shock absorber as the piston shaft 130 moves into the damper body. Fluid communication between the main chamber of the damper and the reservoir 125 may be via a flow channel including an adjustable needle valve. In its basic form, the damper works in conjunction with the helical spring and controls the speed of movement of the piston shaft by metering incompressible fluid from one side of the damper piston to the other, and additionally from the main chamber to the reservoir, during a compression stroke (and in reverse during the rebound or extension stroke).

Various refinements have been made to shock absorbers like the one shown in FIG. 1 to enhance their performance. One continuing problem is that of a "bottom out" condition where the dampening piston becomes completely retracted due to compressive forces brought about by terrain and the weight of a rider. Additionally problematic is the fact that the dampening fluid typically increases in temperature during use. A "bottom out" dampener that may be initially set up to be effective at higher dampening fluid temperature will often be too stiff at lower temperatures during initial stages of use (noting that the shock fluid temperature may never even rise to an ideal temperature) creating a harsh ride and poor vehicle handling characteristics. A dampener that works well and initially doesn't bottom out too hard may begin to bottom out as the dampening fluid becomes heated and correspondingly less viscous during use or extended use.

To avoid bottom out, various means have been utilized to increase dampening in a position-sensitive manner whereby the dampening increases as the piston nears the end of a compressive stroke. In one example, illustrated in U.S. Pat. No. 6,446,771 (which patent is incorporated by reference herein in its entirety), a shock absorber includes an additional piston located at an end of the piston shaft and designed to enter a completely closed cup-shaped member as the shock absorber approaches complete compression. The arrangement adds an additional fluid metering dampening piston and therefore additional dampening, as the shock nears the end of its stroke.

U.S. Pat. No. 6,029,958, which is also incorporated by reference herein in its entirety, provides an increase in dampening as the shock is compressed by using a pin and hole arrangement. As illustrated in FIG. 1 of the '958 patent, the piston has an aperture formed in its center and the aperture serves as a fluid path during a first portion of the shock's compression stroke. As the piston moves nearer the bottom out position, a pin mounted at a bottom end of the chamber contacts the aperture and prevents further fluid communication.

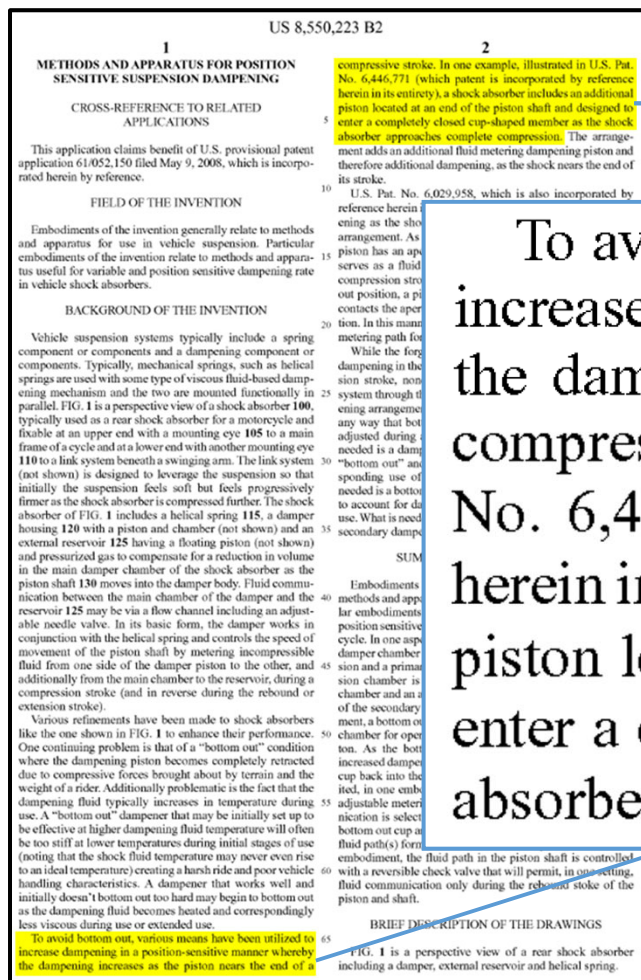
BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a rear shock absorber including a damper, external reservoir and helical spring.

One continuing problem is that of a "bottom out" condition where the dampening piston becomes completely retracted due to compressive forces brought about by terrain and the weight of a rider.

'223 patent (Ex. 1001) at 1:51-54

The '223 patent admits bottom out cups



To avoid bottom out, various means have been utilized to increase dampening in a position-sensitive manner whereby the dampening increases as the piston nears the end of a compressive stroke. In one example, illustrated in U.S. Pat. No. 6,446,771 (which patent is incorporated by reference herein in its entirety), a shock absorber includes an additional piston located at an end of the piston shaft and designed to enter a completely closed cup-shaped member as the shock absorber approaches complete compression.

'223 patent (Ex. 1001) at 1:65-2:9

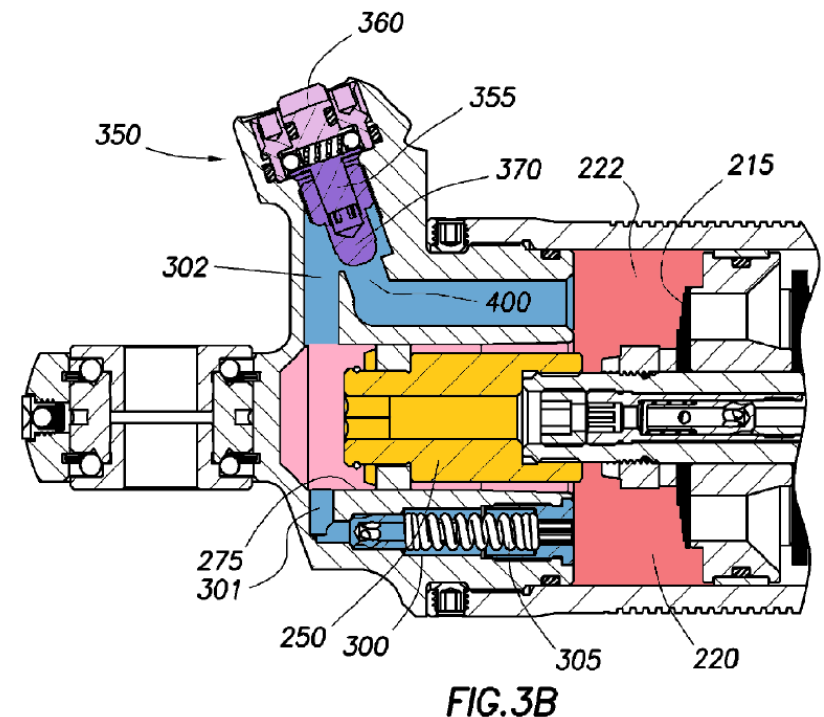
What was known before the '223 patent?

Prior art shock absorbers	
- with dampers	
- with fluid dampers	
- with compression & rebound damper chambers	
- with bottom out cups & pistons	
- with fluid flow paths connecting bottom out cups to damper chambers	
- with adjustable fluid flows / fluid flow paths	

Petition (Paper 2) at 4-16, 21-24, 52-55, 76-78, 105-106; Wang Decl. (Ex. 1002) at ¶¶ 18-36, 47-88

What do the challenged '223 patent claims have in common?

- A damper that includes a bottom out cup (pink) and, in some claims, a bottom out piston (gold)
- During a compression stroke, fluid can flow along a path (blue) between the bottom out cup (pink) and a compression chamber (red)
- The amount of damping can be adjusted, and, in some claims, by an external adjuster (dark purple)



Petition (Paper 2) at 11-16; '223 patent (Ex. 1001) at 1:65-2:9, 2:22-35, 4:33-5:5, FIG. 3B

Independent claim 1 of the '223 patent

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.

- **No** “bottom out” piston
- **No** required directional fluid flow, only fluid communication between

'223 patent (Ex. 1001), 7:39-48; Wang Decl. (Ex. 1002) at ¶¶44, 93, 123, 134;
Wesling Decl. (Ex. 1003) at ¶¶ 42-45, 92, 106, 117, 128, 136, 175;
Second Wang Decl. (Ex. 1019) at ¶¶ 16-18; Institution Decision (Paper 11) at 11-15

Independent claim 11 of the '223 patent

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.

- **No** required location for “bottom out” cup
- **No** required directional fluid flow, only fluid communication between

'223 patent (Ex. 1001), 8:8-23;
Wang Decl. (Ex. 1002) at ¶¶44, 109, 123, 134;
Wesling Decl. (Ex. 1003) at ¶¶ 42-45, 92, 106, 128;
Second Wang Decl. (Ex. 1019) at ¶¶ 16-18

Independent claim 19 of the '223 patent

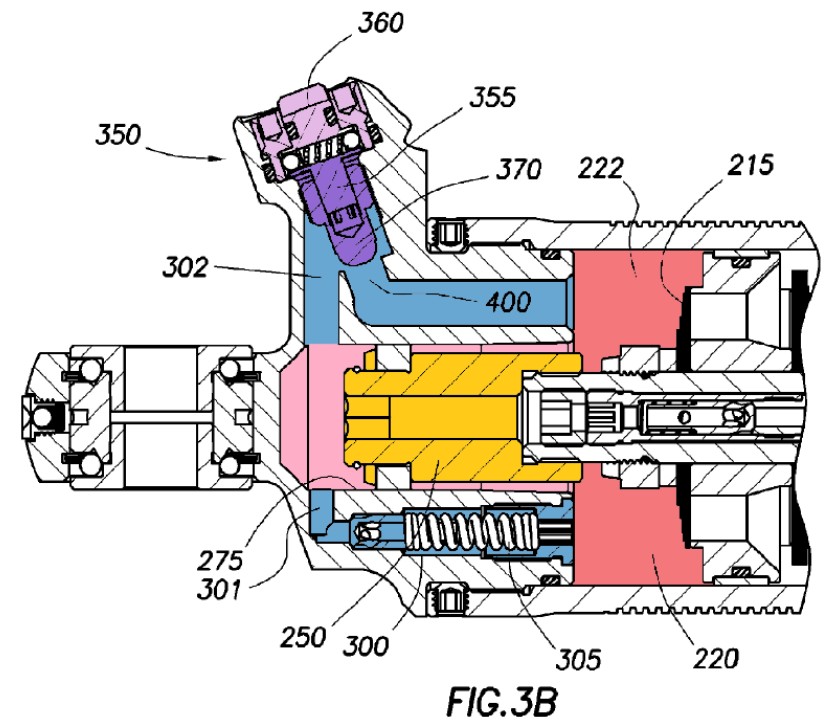
19. A damper for a shock absorber comprising:
a fluid;
a compression chamber;
a bottom out cup;
a valve wherein;
in a compression stroke of the damper, the fluid flows from the bottom out cup to the compression chamber at a first rate with the valve in a first position and at a second rate with the valve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

- **No** “bottom out” piston
- **No** required location for “bottom out” cup

'223 patent (Ex. 1001), 8:61-9:5; Second Wang Decl. (Ex. 1019) at ¶¶ 6-15; Institution Decision (Paper 11) at 11-15

What do the challenged '223 patent claims have in common?

- A damper that includes a bottom out cup (pink) and, in some claims, a bottom out piston (gold)
- During a compression stroke, fluid can flow along a path (blue) between the bottom out cup (pink) and a compression chamber (red)
- The amount of damping can be adjusted, and, in some claims, by an external adjuster (purple)

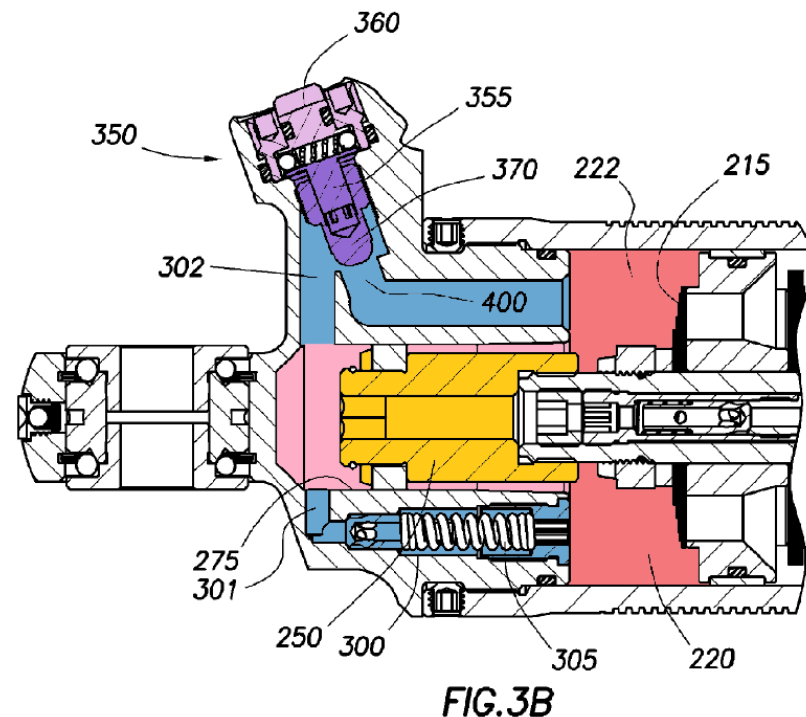


Petition (Paper 2) at 11-16; '223 patent (Ex. 1001) at 1:65-2:9, 2:22-35, 4:33-5:5, FIG. 3B

Attempt to rewrite the '223 patent claims

“The ‘223 patent claims are directed to a dampening mechanism in a shock absorber for a vehicle suspension system. Ex. 1001, 1:13-17, 2:39-43; Ex. 2010, ¶42.”

Patent Owner Response (Paper 15), at 12.



Do the challenged '223 patent claims require:

Shock absorbers / dampers for bicycles or vehicles only?	NONE
Oil-based dampers only?	NONE
Specific amount / degree of damping?	NONE
Damping only at end portion of compression stroke?	NONE
Restricted location for bottom out cup?	CLAIMS 1-9
Bottom out piston?	CLAIMS 11-15
Directional fluid flow between bottom out cup and compression chamber?	CLAIM 19

'223 patent (Ex. 1001), 7:39-48, 8:8-35, 8:61-9:5; Wang Decl. (Ex. 1002) at ¶¶ 18, 32-36, 44-45, 52, 56, 59, 93, 109, 123, 126, 134, 144; Wesling Decl. (Ex. 1003) at ¶¶ 39-46, 92, 106, 117, 128, 135-136, 139, 159, 162, 175, 184; Second Wang Decl. (Ex. 1019) at ¶¶ 6-27, 35-40, 45, 53-55, 58-63; Petition (Paper 2) at 4-17, 21-26, 29-51, 58-75, 81-94, 107-116; Petitioner's Reply (Paper 18) at 3-22, 26-29; Institution Decision (Paper 11) at 9-15

'223 Patent & Invalidating Prior Art

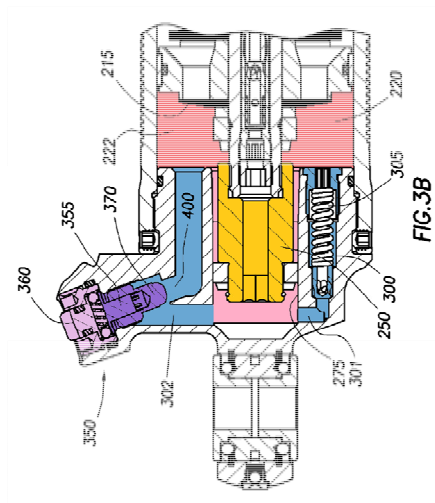
Bottom Out Piston (Gold)

Fluid Flow Paths (Blue)

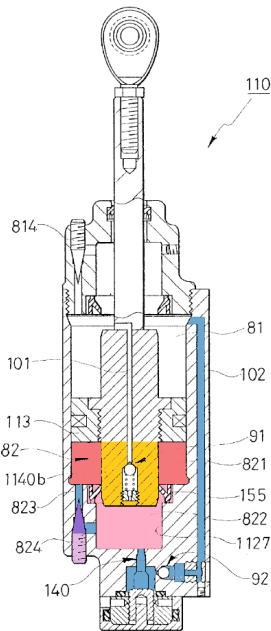
Bottom Out Cup (Pink)

Compression Chamber (Red)

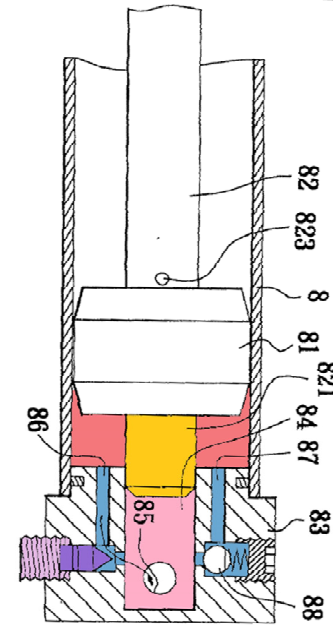
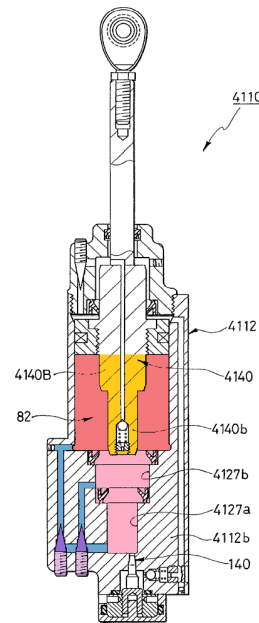
Externally-Adjustable Valve (Purple)



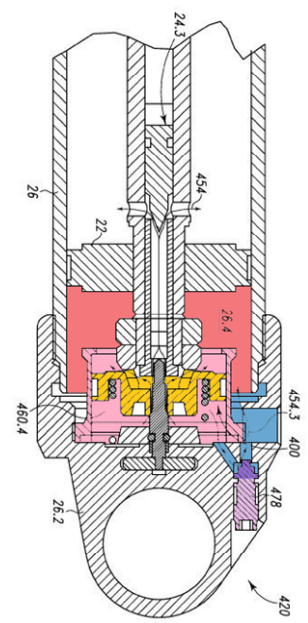
'223 Patent



Nakaya's First & Fourth Embodiments



Chen



Gartner

Petition (Paper 2) at 12-15, 21-24, 29-33, 41-46, 50-55, 68-71, 74-76, 105-110

Patent Owner Fox's Technical Expert



Fox's Expert, Dr. Alexander Slocum

- Professor and Mechanical Engineer, Massachusetts Institute of Technology
- No specifically identified experience or design work in suspension technology or shock absorbers
- **Offers conclusory but inconsistent and contradictory testimony here and in related District Court litigation**

Petitioner's Reply (Paper 18) at 7-12 (citing portions of Slocum Depo. Tr. (Ex. 1020)) at 27-30; Slocum Decl. (Ex. 2010) at ¶¶ 6-13; Petition (Paper 2) at 5-6 n.1; Institution Decision (Paper 11) at 8

Petitioner SRAM's Technical Experts



SRAM's Expert, Dr. Eric Wang

- Associate Professor of Mechanical Engineering, University of Nevada at Reno
- Ph.D., Mechanical Engineering, University of California at Davis (1995) & M.S., Mechanical Engineering, Massachusetts Institute of Technology (1991)
- Over 20 years' design and research experience regarding suspension systems and cycling technology
- **Detailed testimony of POSITA demonstrates invalidity of challenged '223 patent claims and supports plain meaning claim constructions**

Wang Decl. (Ex. 1002) at ¶¶ 2-7

Petitioner SRAM's Technical Experts



SRAM's POSITA, Kevin Wesling

- Global Director of Advanced Development at SRAM
- M.S., Mechanical Engineering, University of Illinois at Urbana-Champaign (1993)
- Over 20 years' experience in design and development of bicycle components, including suspension systems
- **Detailed testimony of POSITA demonstrates invalidity of challenged '223 patent claims and supports SRAM's plain meaning claim constructions**

Wesling Decl. (Ex. 1003) at ¶¶ 3-6

Documentary Evidence

- '223 patent and file history
- Primary undisclosed prior art references
 - U.S. Patent No. 6,558,430 B1 to **Nakaya (Ex. 1005)**
 - UK Patent App. No. GB2377254A to **Chen (Ex. 1007)**
 - U.S. Patent No. 6,604,751 B2 to **Fox (Ex. 1009)**
 - U.S. Patent No. 8,162,112 B2 to **Gartner (Ex. 1010)**
- Other secondary prior art references
- Infringement and invalidity contentions from related, pending District Court litigation
- Deposition testimony, reports, and declarations

Petition (Paper 2) at 3-11, 19-20; *see also generally* Petition (Paper 2) and Petitioner's Reply (Paper 18)

Claim Construction

Term: “bottom out cup”

Petitioner’s Position:

No special definitions needed for any terms different than ordinary and customary meaning

Patent Owner’s Initial Construction:

“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”

Board’s Institution Decision:

“cup-shaped feature configured for providing dampening”

Petition (Paper 2) at 16-17; Patent Owner’s Preliminary Response (Paper 8) at 6-10; Institution Decision (Paper 11) at 10-15

Claim Construction

Term: “bottom out cup”

Patent Owner’s Latest Construction:

~~“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”~~

“cup-shaped feature configured for providing dampening **only** at the end portion of a compression stroke”

Patent Owner’s Preliminary Response (Paper 8) at 7; Patent Owner’s Response (Paper 15) at 8-11

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

LEWIS RICE

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Claim Construction

Term: “bottom out cup”

- Claim 1 (but not claims 11 and 19) restricts the **location** of the bottom out cup
- **No challenged claim** requires the bottom out cup to provide damping **only** at the end of a compression stroke
- On the other hand, unchallenged claim 17 identifies “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[.]**”
- Patent Owner’s latest construction contradicts the claims and the specification (which shows damping **throughout** compression stroke)

Petitioner’s Reply (Paper 18) at 3-5, 27-29; ‘223 patent (Ex. 1001), 8:47-49 (emphasis added); Second Wang Decl. (Ex. 1019) at ¶¶ 6-15; Slocum Depo. Tr. (Ex. 1020) at 39:25-42:7; 44:10-16; 48:6-49:2; 86:11-87:8; Patent Owner’s Sur-Reply (Paper 21) at 4-5

Claim Construction

Term: “bottom out cup”

The Board’s correct view of
ordinary and customary meaning:

“cup-shaped feature configured for providing dampening”

Institution Decision (Paper 11) at 10-15

Claim Construction

Term: “fluid communication from the cup to the compression portion of the chamber”

Petitioner’s Position:

No special definitions needed for any terms different than ordinary and customary meaning

Patent Owner’s Initial Construction:

Other than the “bottom out cup” terms, “Patent Owner agrees that no other claim terms need to be construed to resolve the dispute between the parties at this time.”

Board’s Institution Decision:

No other terms in need of construction.

Petition (Paper 2) at 16; Patent Owner’s Preliminary Response (Paper 8) at 6; Institution Decision (Paper 11) at 15

Claim Construction

Term: “fluid communication from the cup to the compression portion of the chamber”

Patent Owner’s Latest Construction:

~~Other than the “bottom out cup” terms, “Patent Owner agrees that no other claim terms need to be construed to resolve the dispute between the parties at this time.”~~

Claim 1 requires **directionality of fluid flow**, i.e., “fluid flows from the cup to the compression portion during a compression stroke”

Patent Owner’s Preliminary Response (Paper 8) at 6; Patent Owner’s Response (Paper 15) at 11-12

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

LEWIS RICE

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Claim Construction

Term: “fluid communication from the cup to the compression portion of the chamber”

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.

- Fox’s improper engrafting of directional limitation ignores that claim 1 is claiming a fluid flow path, not fluid flow itself
- A fluid flow path or “bridge” permits two-way flow, just like a telephone wire extending “from” one building “to” the next building permits two-way communication

Petition (Paper 2) at 32 n.2; Wang Decl. (Ex. 1002) at ¶¶ 42-44, 93, 123; Second Wang Decl. (Ex. 1019) at ¶¶ 16-18

Claim Construction

Term: “fluid communication from the cup to the compression portion of the chamber”

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.

- Claim 11 also claims the fluid flow path between the bottom out cup and compression chamber
- Dr. Slocum admitted in the District Court that claim 11 was not directional in flow
- In contrast, claim 19 claims directional fluid flow
- **In any event—claim 1 is still invalid**

Petitioner’s Reply (Paper 18) at 6-7; Second Wang Decl. (Ex. 1019) at ¶¶ 16-18; Slocum Infringement Expert Report (Ex. 1022) at ¶ 143

Claim Construction

**Term: “fluid communication from the cup
to the compression portion of the chamber”**

Ordinary and customary meaning:

No directional flow required for claim 1’s fluid flow path

Petition (Paper 2) at 32 n.2; Wang Decl. (Ex. 1002) at ¶¶ 42-44, 93, 123; Petitioner’s Reply (Paper 18) at 6-7; Second Wang Decl. (Ex. 1019) at ¶¶ 16-18

Instituted Grounds 1A & 1B

**Ground 1A: Nakaya anticipates
claims 1-9, 11-15 & 19**

**Ground 1B: Nakaya alone and/or
Nakaya in view of Kodama
renders claims 4 & 8 obvious**

Petition (Paper 2) at 3, 21-51; Institution Decision (Paper 11) at 15-37

'223 Patent & Invalidating Prior Art

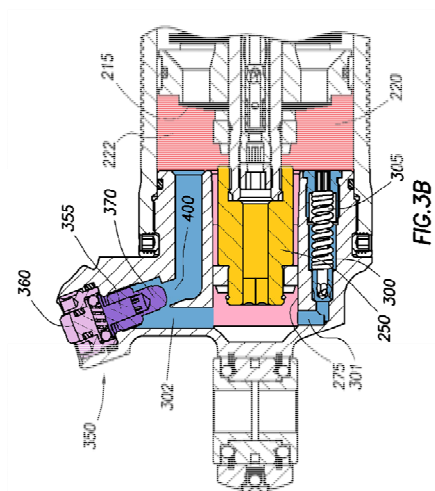
Bottom Out Piston (Gold)

Fluid Flow Paths (Blue)

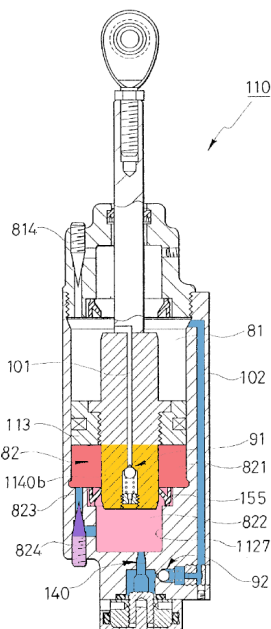
Bottom Out Cup (Pink)

Compression Chamber (Red)

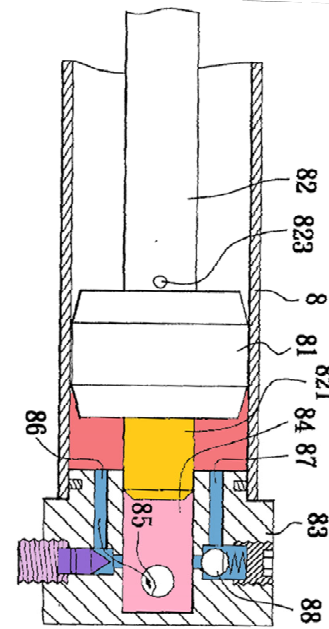
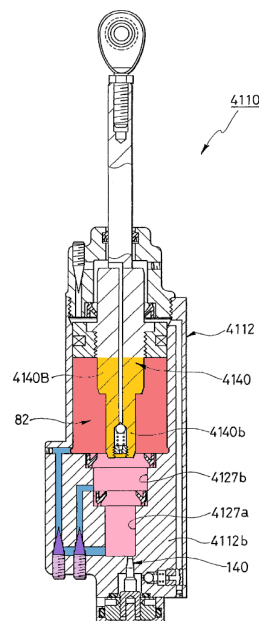
Externally-Adjustable Valve (Purple)



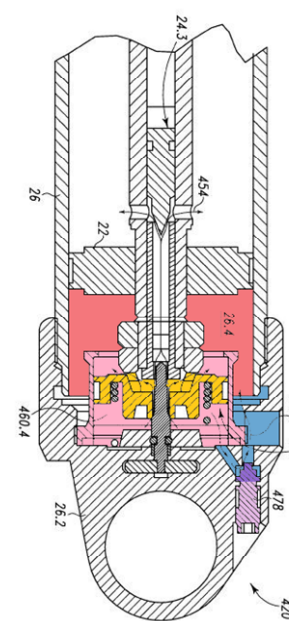
'223 Patent



Nakaya's First & Fourth Embodiments



Chen

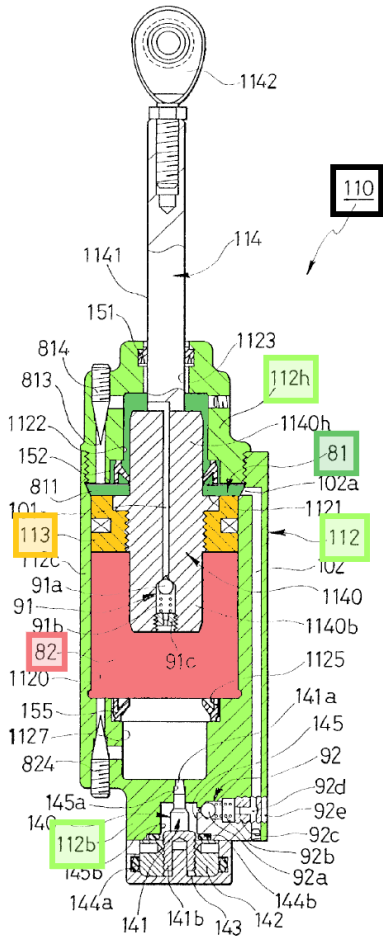


Gartner

Petition (Paper 2) at 12-15, 21-24, 29-33, 41-46, 50-55, 68-71, 74-76, 105-110

Ground 1: Nakaya

- The Board recognized that Nakaya discloses a damper
- Nakaya has a fluid-based (air) damper of a shock absorber 110 for a suspension system
- The damper is formed by a cylindrical body 112 (light green) that is closed on either end by head part 112h and bottom part 112b
- The volume formed in the damper is divided by a piston 113 (gold) into a compression portion 82 (red) and a rebound portion 81 (dark green)



Petition (Paper 2) at 21; Institution Decision (Paper 11) at 15-18; Wang Decl. (Ex. 1002) at ¶¶ 52-57; Wesling Decl. (Ex. 1003) at ¶¶ 52-57; Nakaya (Ex. 1005) at FIG. 7

Ground 1: Nakaya

- **Nakaya's damper uses air as a working fluid that produces damping** when forced through Nakaya's various restrictions
 - E.g., throttle passage 823 and constant throttle valve 140 in Figs. 7–9 (Nakaya's first embodiment); and
 - E.g., the two paths around Nakaya's throttle valves 4824a, 4824b in Figs. 17–19 (Nakaya's fourth embodiment)
- Patent Owner's expert **admits Nakaya is a damper**
- Patent Owner provides only conclusory statements and no real contradictory evidence

Petitioner's Reply (Paper 18) at 7-10; Wang Decl. (Ex. 1002) at ¶¶ 56-57; Second Wang Decl. (Ex. 1019) at ¶¶ 32-34; Slocum Depo. Tr. (Ex. 1020) at 95:5-10

Patent Owner's expert calls Nakaya a “damper”



Patent Owner's Expert, Alexander Slocum

5 If you look on Figure 20, for
6 example, you have torque versus knee angle.
7 Torque would be the force in **this damper** acting
8 over a distance. The bend angle is part of
9 that. There's another one in Figure 10 that
10 shows the torque is a function of angle.

**Nakaya Fig. 20
(relating to its fourth embodiment)**

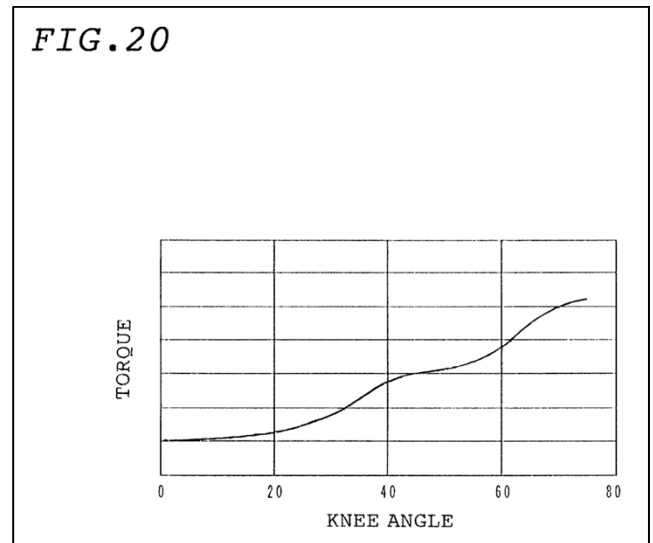


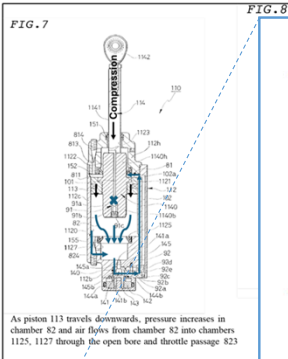
FIG. 20 is a graph showing pressure characteristics of the fourth embodiment.

Slocum Depo. Tr. (Ex. 1020) at 95:5-10; Nakaya (Ex. 1005) at 4:57-58, FIG. 20

Nakaya is a damper

Patent Owner's Response (Paper 15) at 15:

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Patent No. 8,550,223



Ex. 2010, ¶57 (annotated Figures 7 and 8)

The downward and upward motion (the difference being that the during u

projection 1140h extends into head part 112h). Ex. 2010, ¶58. During upward motion,

air in rebound chamber 81 flows to chamber 82 through passage 101 that passes through piston rod 114 and includes a check valve 91. *Id.*; Ex. 1005, 7:24-34. 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. Ex. 2010, ¶58.

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through piston rod 114 and includes a check valve 91. *Id.*; Ex. 1005, 7:24-34. 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. Ex. 2010, ¶58.

Nakaya is a damper

Patent Owner's Sur-Reply (Paper 21) at 10:

Case IPR2024-00216
Patent No. 8,550,223

"reasonably understand or infer from [Nakaya's] teaching" that a "damper" is disclosed. *Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1368 (Fed. Cir. 2003).

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.*

Petitioner's discussion of "air-based damper[s]" with reference to the England (Ex. 1018) and Kastan (Ex. 1021) patents is irrelevant because Patent Owner's expert agrees that air-based dampers are possible, although not "as volume efficient as oil."

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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

Nakaya is a damper



SRAM's Expert, Eric Wang

See, e.g., Response, 22–26. However, Nakaya contains damping elements. *See, e.g.,* Ex. 1002, ¶¶53–57, 89–90. Any 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. A POSITA would understand from a visual inspection that Nakaya's throttle valves/passages 140, 832, 4824a, and 4824b provide damping. Thus, Nakaya is a shock absorber having a damper because it is designed to provide damping. Perhaps Nakaya does not use the words “damping” or “damper”, but everyone agrees that Nakaya discloses damping.

Second Wang Decl. (Ex. 1019) at ¶ 20; *see also* Wesling Decl. (Ex. 1003) at ¶¶ 52, 89

Nakaya is a damper

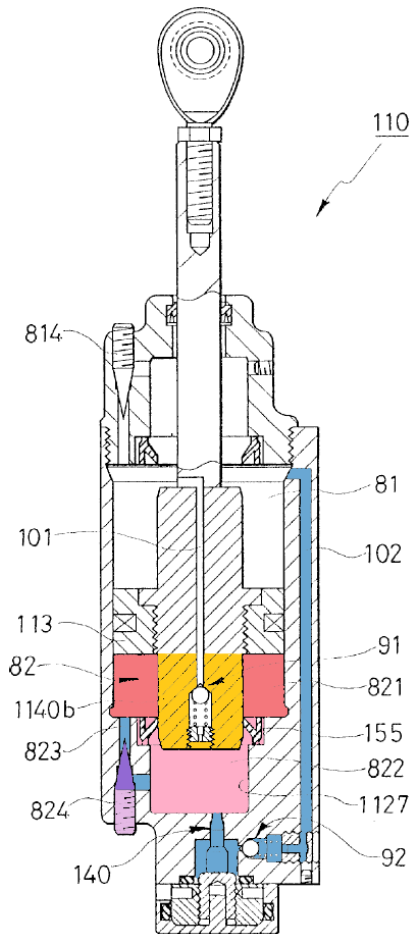


SRAM's Expert, Eric Wang

21. More particularly, Nakaya provides 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"). Dr. Slocum even admitted that forcing a fluid through a restriction

Second Wang Decl. (Ex. 1019) at ¶ 21; *see also* Wesling Decl. (Ex. 1003) at ¶¶ 52, 89

'223 patent claims do not require argued restrictions

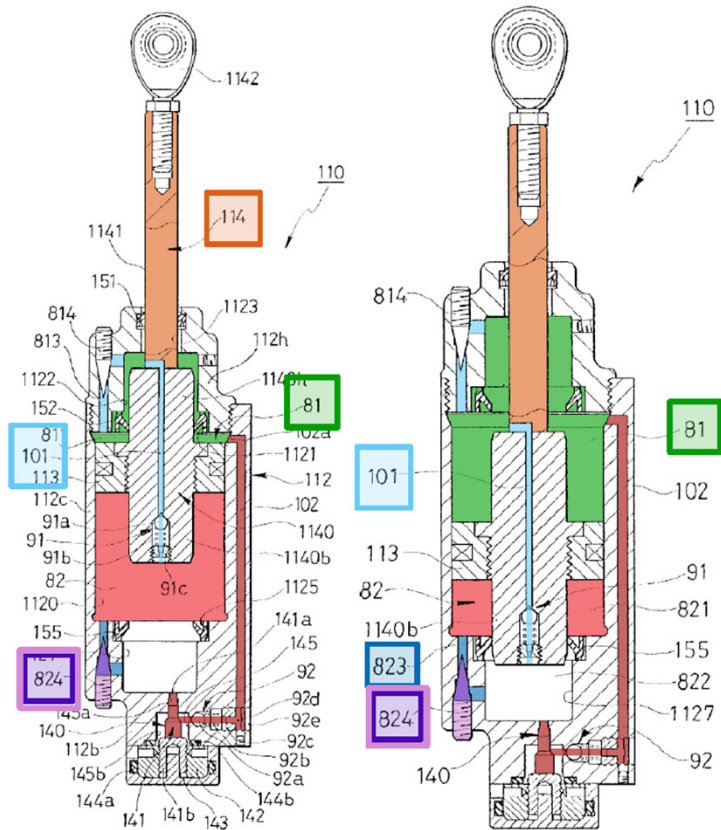


- Patent Owner's expert admitted that **no specific "amounts" of damping are required by the '223 patent claims**, nor did he attempt to quantify the amount of damping in Nakaya
- '223 patent claims only require the damper to use **"fluid" which can be oil or air**
- Patent Owner admits that **air-based dampers exist**, even for bicycles

Slocum Depo. Tr. (Ex. 1020) at 106:7-18, 107:9-12, 117:3-5; Patent Owner Response (Paper 21) at 10; Nakaya (Ex. 1005) at FIG. 8; Englund Patent (Ex. 1018) at 1, 3, FIG. 1

Ground 1: Nakaya

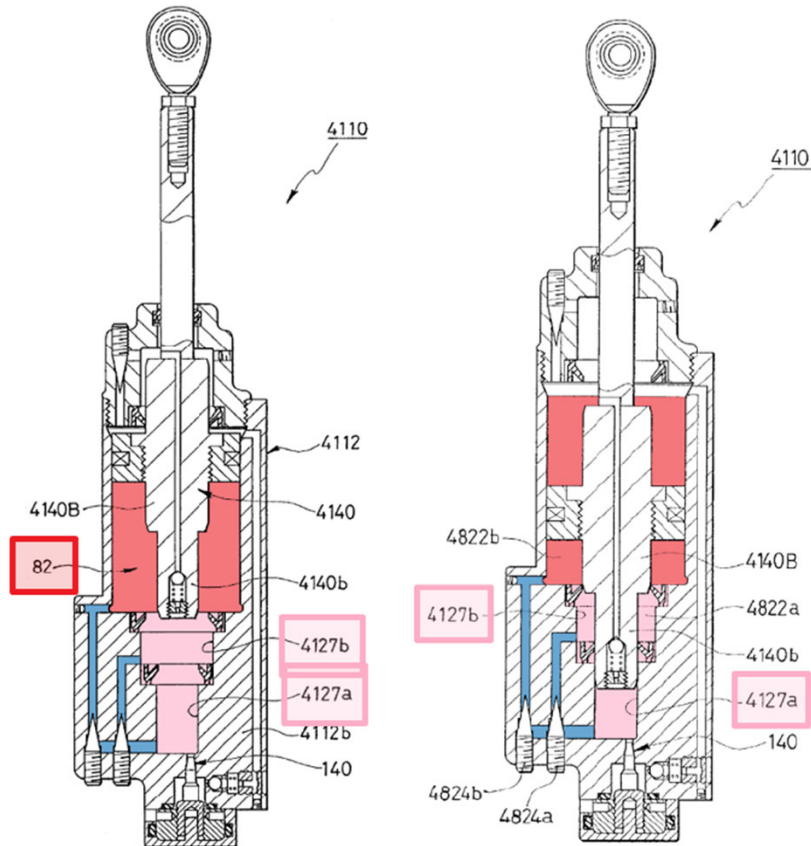
- Nakaya includes:



- the use of at least three different fluid channels from the bottom out cup, with two extending into the compression portion (lt. red) and one into the rebound portion 81 (green)
- the fluid channel 823 (dark blue) is adjustable via a needle valve 824 (dark purple) that is externally actuated by an adjuster (lt. purple)
- the fluid channel 87 (dark red) is regulated by a check ball valve 92
- the fluid channel 101 (lt. blue) penetrates through the piston rod 114 (orange) and interacts with the passage 813 (lt. blue)

Petition (Paper 2) at 21-24; Institution Decision (Paper 11) at 25-34; Wang Decl. (Ex. 1002) at ¶¶ 52-55, 77; Wesling Decl. (Ex. 1003) at ¶¶ 52-55, 77; Nakaya (Ex. 1005) at FIGs. 7-8

Ground 1: Nakaya

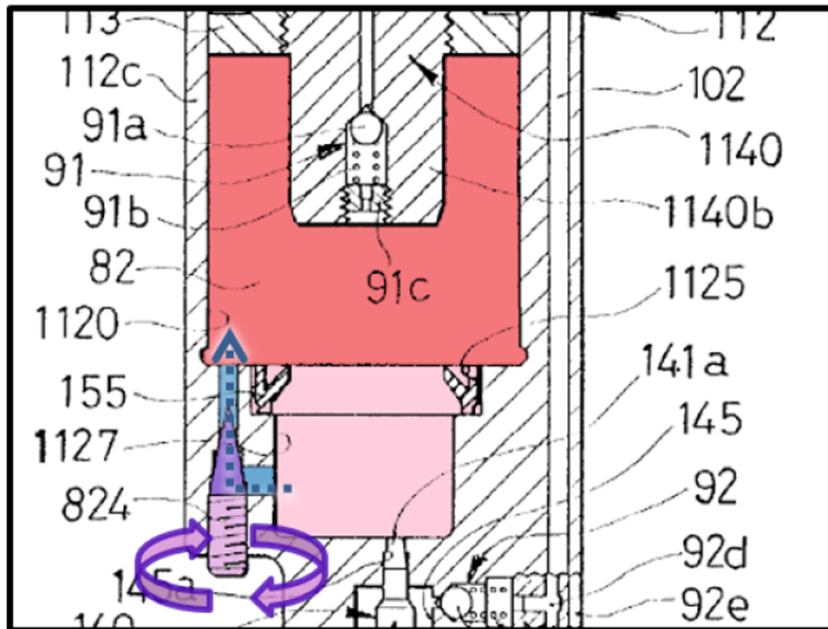


Nakaya's fourth embodiment includes:

- the same features as the first embodiment, plus
- a bottom out cup with holes 4127a (pink) and 4127b (pink), and
- the bottom out cup connected to the compression portion 82 (red) via a set of flow paths (blue) having a plurality of manually adjustable needle valves 4824a, 4824b having a plurality of open positions and a closed position

Petition (Paper 2) at 23-24; Wang Decl. (Ex. 1002) at ¶¶ 52-55; Wesling Decl. (Ex. 1003) at ¶¶ 52-55; Nakaya (Ex. 1005), at FIGs. 17, 19

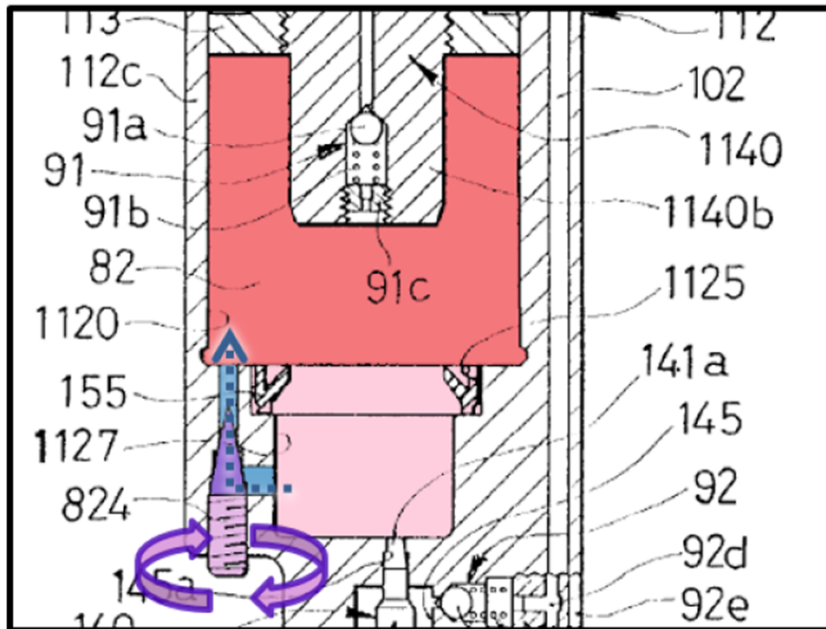
Ground 1: Nakaya



- The Board recognized Nakaya's damper chamber and adjustable fluid flow path
- Nakaya discloses that the fluid flow path 823 (blue) formed in bottom out cup 1125, 1127 (pink) provides fluid communication from the cup to the compression portion 82 (red) of chamber 81, 82 during the damper's compression stroke
 - a path is formed from one to the other
 - fluid flows from the bottom out cup to the compression portion during a compression stroke

Petition (Paper 2) at 31-34; Institution Decision (Paper 11) at 25-29; Nakaya (Ex. 1005) at FIG. 7

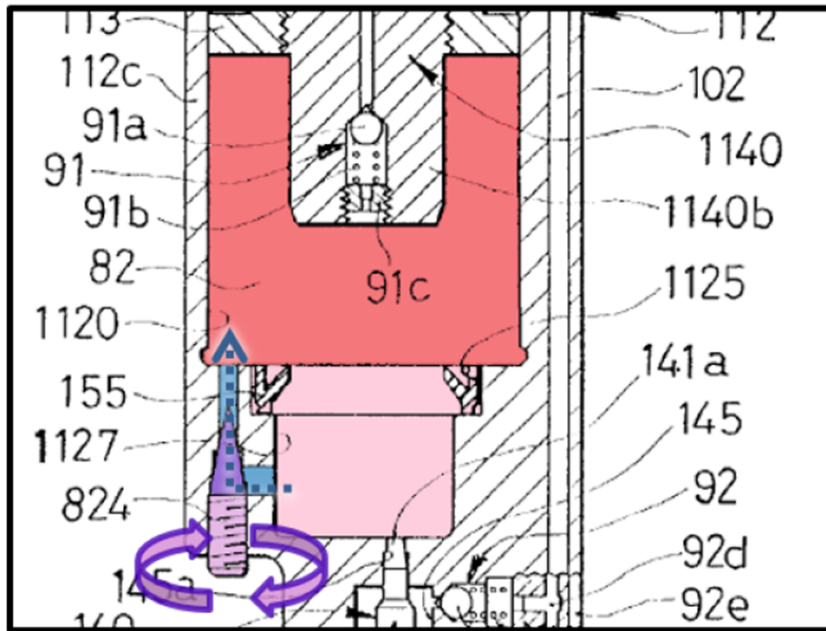
Ground 1: Nakaya



- In Nakaya, the air in the bottom out cup (1125, 1127) increases in pressure at a faster rate than air in the compression portion (82/821) – thus, **air will naturally move from the bottom out cup to the compression portion** to balance the pressures
- Dr. Slocum provides no real evidence to support his conclusory opinion

Wang Decl. (Ex. 1002) at ¶¶ 56-57; Second Wang Decl. (Ex. 1019) at ¶¶ 32-34; Institution Decision (Paper 11) at 27-28 ; Nakaya (Ex. 1005) at FIG. 7

Ground 1: Nakaya



- **For Claim 13**, Nakaya's first embodiment discloses a fluid flow path 823 (blue) formed between bottom out cup 1125, 1127 (pink) and primary compression chamber 82 (red) during a compression stroke of the damper
- Patent Owner's argument that the same path in claim 1 cannot read on the path in claim 13 is also contrary to Patent Owner's infringement contentions and expert's infringement report

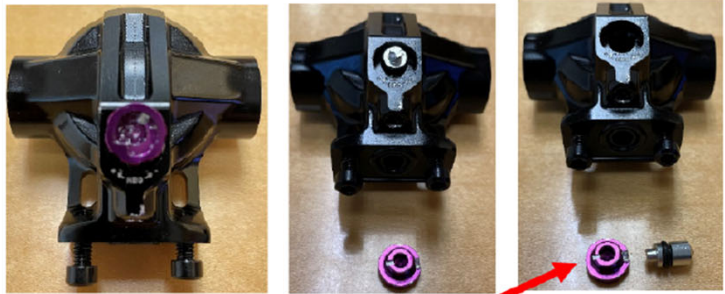
Petition (Paper 2) at 47-49; Petitioner's Reply (Paper 18) at 15-23; Wang Decl. (Ex. 1002) at ¶¶ 111-112; Second Wang Decl. (Ex. 1019) at ¶¶ 35-41; Nakaya (Ex. 1005) at FIG. 7

Ground 1: Nakaya

- Patent Owner accused the same structure of infringing Claims 1 and 13 in the District Court, relying upon the same path in Claims 1 and 13

Claim	U.S. Patent No. 8,850,223	RockShox Super Deluxe Coil Ultimate
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.	The RockShox Super Deluxe Coil Ultimate has the damper of claim 12, which further includes a fluid flow path formed between the cup and the primary compression chamber, and wherein the capacity of the fluid flow path is adjustable. <i>See supra claim 2.</i>

Claim	U.S. Patent No. 8,850,223	RockShox Super Deluxe Coil Ultimate
2	The damper of claim 1, wherein the capacity of the flow path is adjustable with an adjustable valve, the valve restricting the fluid flow.	The RockShox Super Deluxe Coil Ultimate has the damper of claim 1, wherein the capacity of the flow path is adjustable with an adjustable valve, with the valve restricting the fluid flow. <i>See supra claim element 1[d].</i>

Claim	U.S. Patent No. 8,850,223	RockShox Super Deluxe Coil Ultimate
1[d]	wherein the capacity of the fluid flow path is adjustable.	In the RockShox Super Deluxe Coil Ultimate, the capacity of the fluid flow path is adjustable.  Adjustable valve to adjust capacity of fluid flow path

Petition (Paper 2) at 16, 47-49; Petitioner's Reply (Paper 18) at 15-23; Wang Decl. (Ex. 1002) at ¶¶ 111-112; Second Wang Decl. (Ex. 1019) at ¶¶ 35-41; Patent Owner's Infringement Contentions (Ex. 1013) at 19-20, 35

Ground 1: Nakaya

c. Claim 13

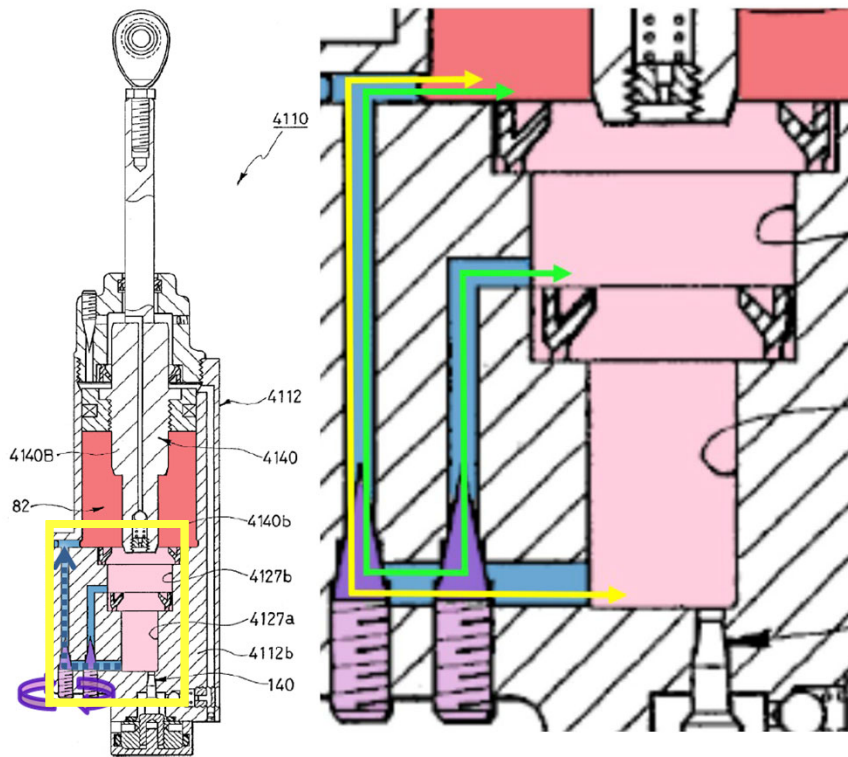
The damper of claim 12, further including a fluid flow path formed between the cup and the primary compression chamber; wherein the capacity of the fluid flow path is adjustable.

146. Claim 13 is not limited to a compression stroke. During a rebound stroke, some oil (fluid) flows from the reservoir through the adjustable fluid flow path (Hydraulic Bottom Out port) into the bottom out cup and then into the primary compression portion of the damper chamber (which is next to the bottom out cup and in fluid flow), thus providing a fluid flow path between the cup and the primary compression chamber. *See* testimony of SRAM's Kevin Wesling (excerpted below). The capacity of the fluid flow, i.e., the flow rate volume/time, between the cup and primary compression chamber is adjustable because of the hydraulic bottom-out adjuster disposed in the Hydraulic Bottom Out port. The adjuster (referred to as needle valve by Mr. Wesling) adjusts the capacity of fluid flow into the bottom out cup and thus into the primary compression chamber (from the bottom out cup).

- Dr. Slocum accused **the same path of infringing claims 1 and 13 in his expert report** in the District Court
- No distinction here between a compression stroke and a rebound stroke **because it is the same fluid flow path**

Slocum Infringement Report (Ex. 1022) at ¶ 146; Petitioner's Reply (Paper 18) at 21; Second Wang Decl. (Ex. 1019) at ¶ 46

Ground 1: Nakaya



- Nakaya's fourth embodiment discloses two fluid flow paths (green and yellow arrows) formed between bottom out cup 4127a, 4127b (pink) and primary compression chamber 82 (red) during the damper's compression stroke
- The fluid flow path following the yellow arrow **is different** from the fluid flow path following the green arrow
- Two paths may cross or share a portion and remain two distinct paths

Petition (Paper 2) at 48-49; Petitioner's Reply (Paper 18) at 18-23; Second Wang Decl. (Ex. 1019) at ¶¶ 43-45; Nakaya (Ex. 1005) at FIG. 17

Instituted Grounds 2A & 2B

**Ground 2A: Chen anticipates
claims 1-5, 9, 11-15 & 19**

**Ground 2B: Chen alone and/or
Chen in view of Deferme or Kodama
renders claims 1-5, 9, 11-15 & 19 obvious**

Petition (Paper 2) at 3, 52-76; Institution Decision (Paper 11) at 37-44

Instituted Ground 3

**Ground 3: Fox '751 renders
claims 1-5, 9, 11-15 & 19 obvious
in view of Chen and/or Kodama**

Petition (Paper 2) at 3, 76-94; Institution Decision (Paper 11) at 44-46

Instituted Ground 4

**Ground 4: Fox '751 renders
claims 5-9 obvious in view of Chen and
further in view of Nakaya and/or Kodama**

Petition (Paper 2) at 3, 95-104; Institution Decision (Paper 11) at 47

'223 Patent & Invalidating Prior Art

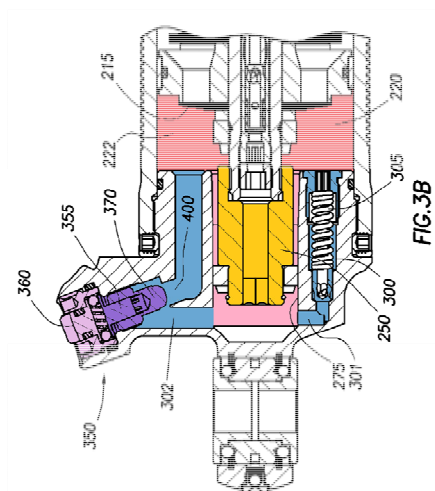
Bottom Out Piston (Gold)

Fluid Flow Paths (Blue)

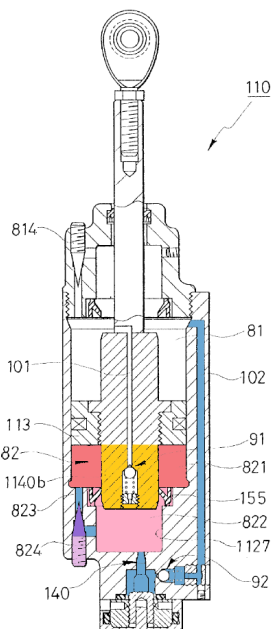
Bottom Out Cup (Pink)

Compression Chamber (Red)

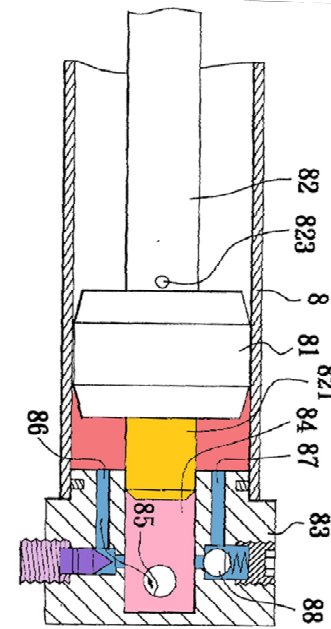
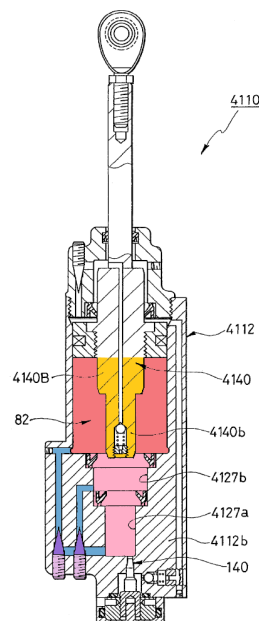
Externally-Adjustable Valve (Purple)



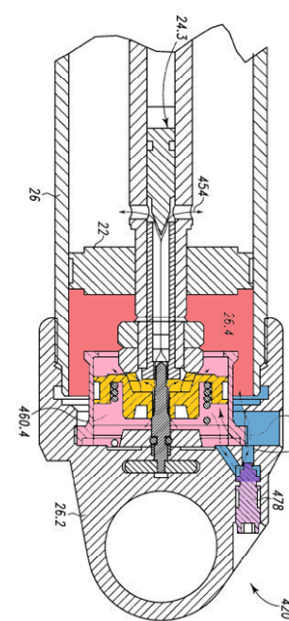
'223 Patent



Nakaya's First & Fourth Embodiments



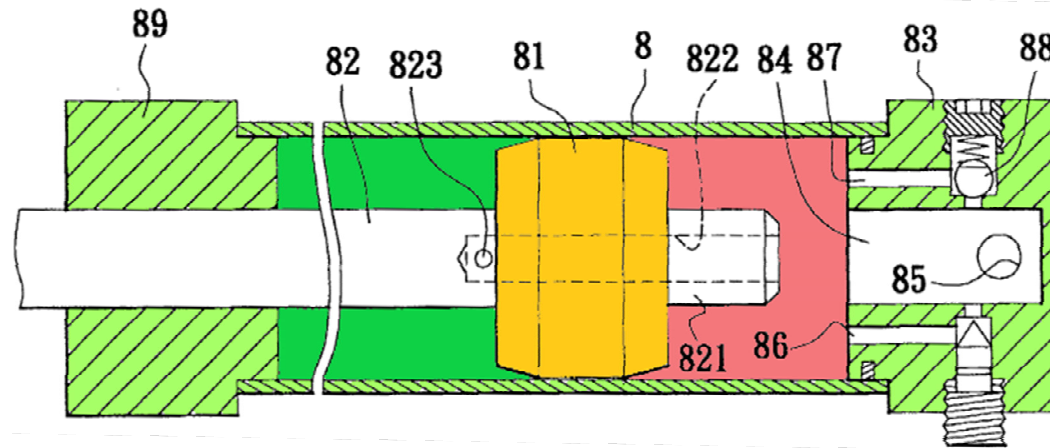
Chen



Gartner

Petition (Paper 2) at 12-15, 21-24, 29-33, 41-46, 50-55, 68-71, 74-76, 105-110

Grounds 2, 3, and 4: Chen or Fox '751 in view of Chen



- Chen discloses a conventional suspension damper formed by a hydraulic cylinder 8 (light green) closed on either end by caps 83, 89 (light green)
- The volume formed in the damper is divided by a piston 81 (gold) into a compression portion (red) and a rebound portion (dark green)

Petition (Paper 2) at 52; Wang Decl. (Ex. 1002) at ¶ 62; Wesling Decl. (Ex. 1003) at ¶ 62; Chen (Ex. 1007) at FIG. 4

Grounds 2, 3, and 4: Chen or Fox '751 in view of Chen

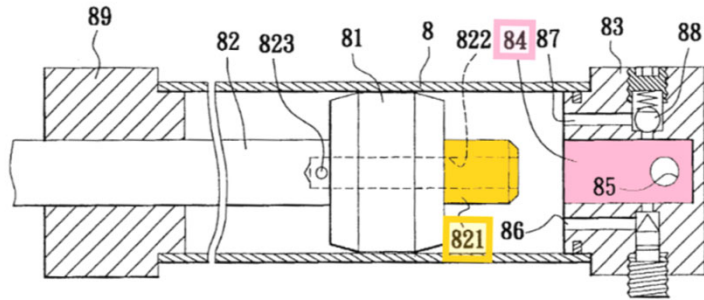


FIG. 4

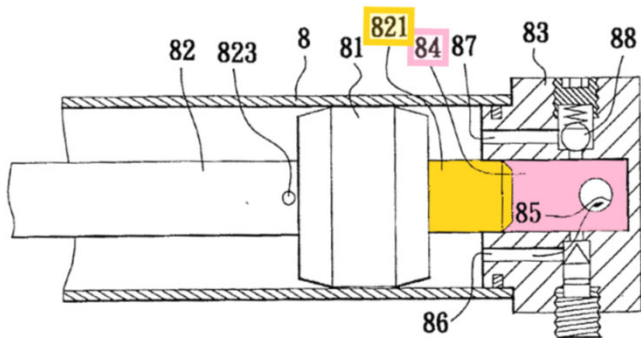


FIG. 5

- Chen includes:
 - the claimed bottom out cup as the accommodating cavity 84 (pink); and
 - the claimed bottom out piston as the projecting post 821 (gold) of piston 81

2) at 53; Wang Decl. (Ex. 1002) at ¶ 63; Wesling Decl. (Ex. 1003) at ¶ 63; Chen (Ex. 1007) at FIGS. 4-5

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

LEWIS RICE

52

Grounds 2, 3, and 4: Chen or Fox '751 in view of Chen

- Chen includes:

- the use of at least three different fluid channels from the bottom out cup, with two extending into the compression portion (light red) and one into the rebound portion (dark green)
- the fluid channel 86 (dark blue) that is adjustable via a needle valve (dark purple) that is externally actuated by an adjuster (light purple)
- the fluid channel 87 (dark red) regulated by a check ball valve 88
- the fluid channel 822, 823 (light blue) penetrating through the piston shaft 82

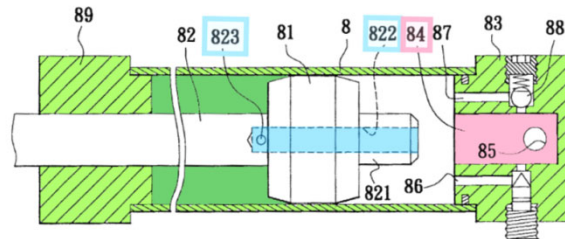
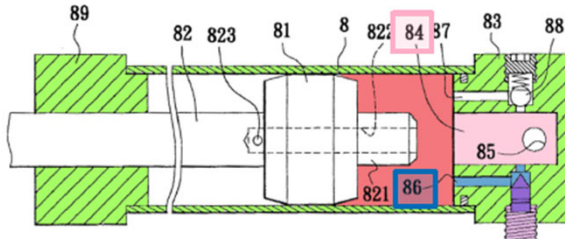
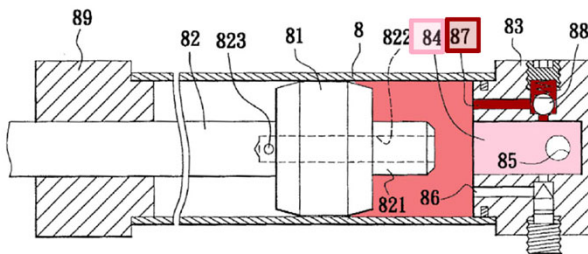
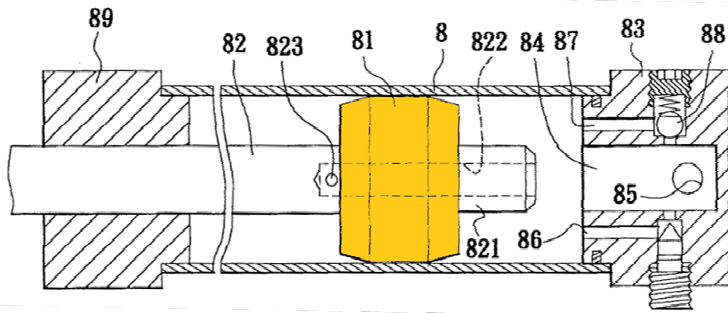


FIG. 4



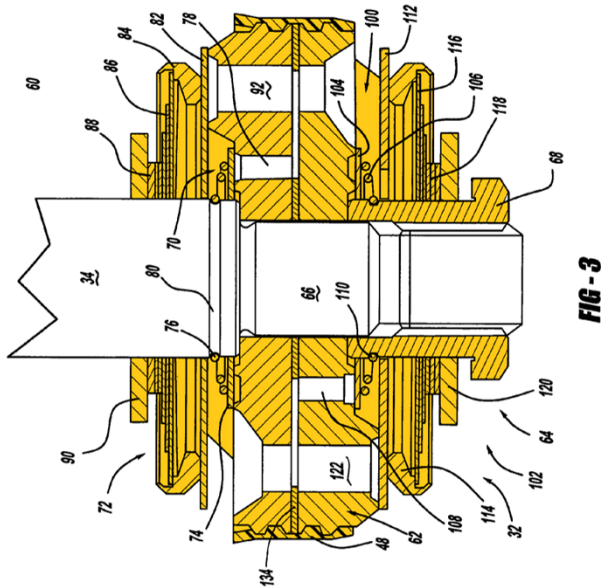
Petition (Paper 2) at 54-55; Wang Decl. (Ex. 1002) at ¶ 64; Wesling Decl. (Ex. 1003) at ¶ 64; Chen (Ex. 1007) at FIG. 4

Grounds 2, 3, and 4: Chen or Fox '751 in view of Chen



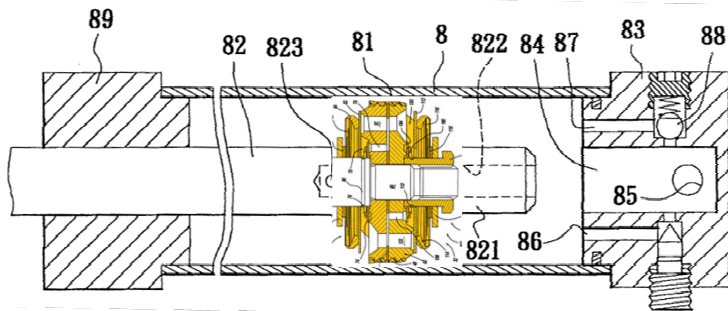
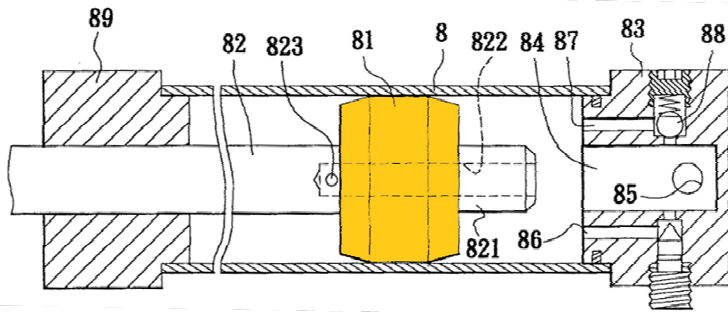
• Chen in view of Deferme:

- A POSITA would have been motivated to modify Chen to have Deferme's means for adjusting the flow of fluid (including two one-way valves 72, 102) through Chen's piston 81, or substitute Chen's piston 81 with Deferme's piston 32
- at least because a means for adjustment would predicably create a more versatile device having a range of damping and spring values



Petition (Paper 2) at 55-58; Wang Decl. (Ex. 1002) at ¶¶ 79-80; Wesling Decl. (Ex. 1003) at ¶¶ 79-80; Chen (Ex. 1007) at FIG. 4; Deferme (Ex. 1008) at FIG. 3

Grounds 2, 3, and 4: Chen or Fox '751 in view of Chen

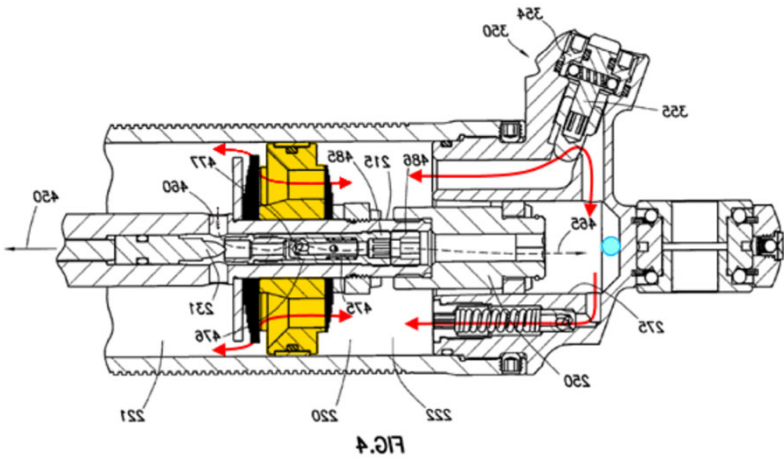


Chen with Deferme

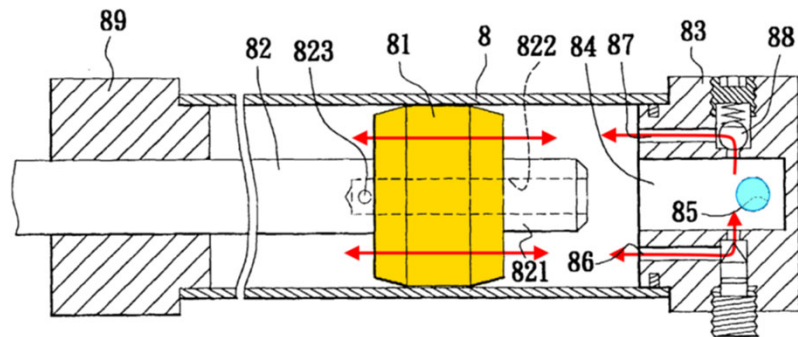
- Chen in view of Deferme:
 - A POSITA would have been motivated to modify Chen to have Deferme's means for adjusting the flow of fluid (including two one-way valves 72, 102) through Chen's piston 81, or substitute Chen's piston 81 with Deferme's piston 32
 - at least because a means for adjustment would predicably create a more versatile device having a range of damping and spring values

Petition (Paper 2) at 55-58; Wang Decl. (Ex. 1002) at ¶¶ 79-80; Wesling Decl. (Ex. 1003) at ¶¶ 79-80; Chen (Ex. 1007) at FIG. 4; Deferme (Ex. 1008) at FIG. 3

Grounds 2, 3, and 4: Chen or Fox '751 in view of Chen



'223 patent, Fig. 4 (reversed)



Chen with Deferme

- Chen with Deferme's adjustable piston would have the exact same structure as the '223 patent's embodiments
- This shared structure is **solely responsible** for the direction of fluid flow through the paths during a compression stroke

Petition (Paper 2) at 56-58, 61-62; Petitioner's Reply (Paper 18) at 23-27; Second Wang Decl. (Ex. 1019) at ¶¶ 48-53; '223 patent (Ex. 1001) at FIG. 4; Chen (Ex. 1005) at FIG. 4

Grounds 2, 3, and 4: Chen or Fox '751 in view of Chen

- Fox '751 includes the exact same damper architecture as the '223 patent but for the bottom out functionality
- Chen teaches a POSITA how to make the bottom out cup, bottom out piston, and related adjustable flow path and blowoff valve

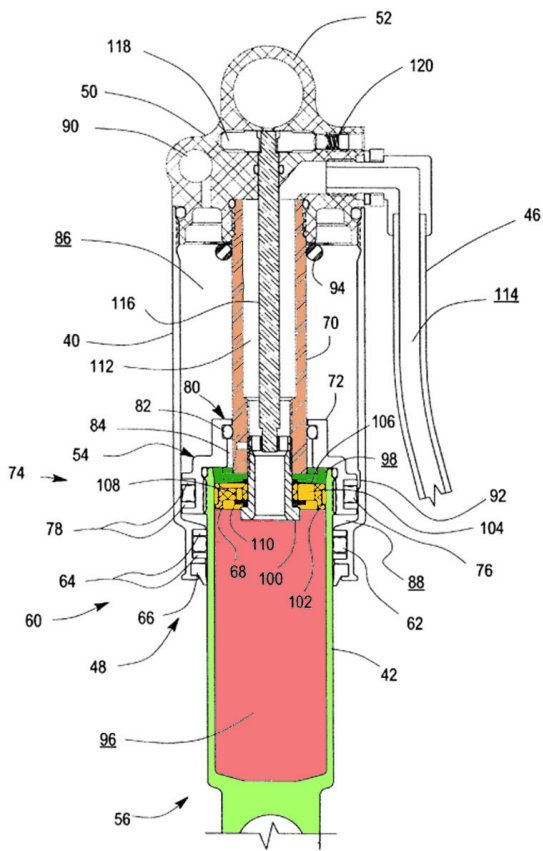
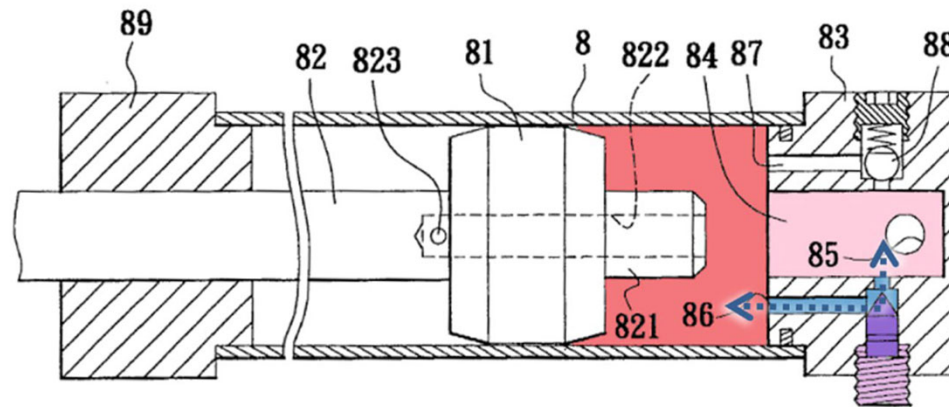


FIG. 3A



Petition (Paper 2) at 76-81; Wang Decl. (Ex. 1002) at ¶¶ 68-69, 81-85; Wesling Decl. (Ex. 1003) at ¶¶ 68-69, 81-85; Chen (Ex. 1007) at FIG. 4; Fox '751 (Ex. 1009) at FIG. 3A

Grounds 2, 3, and 4: Chen or Fox '751 in view of Chen

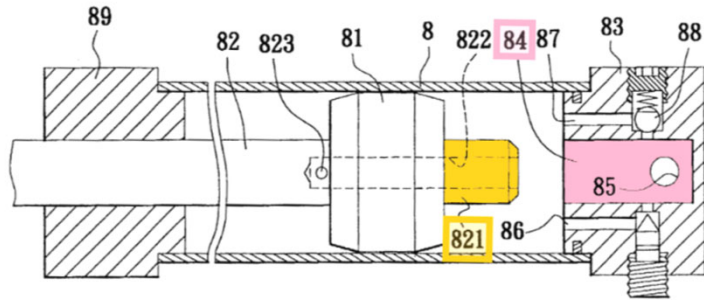


FIG. 4

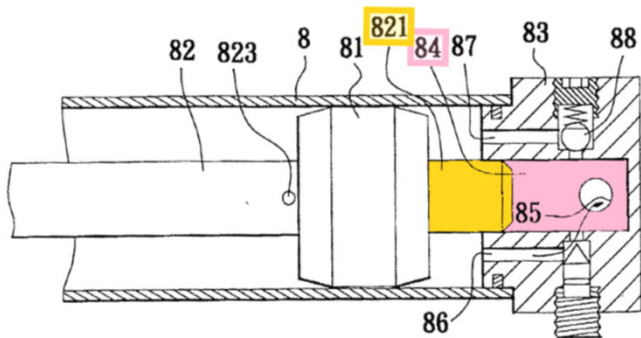


FIG. 5

- Chen's bottom out piston, or projecting post 821 (gold), is formed on Chen's piston rod 82
- Term "formed on" does not exclude direct connections or the bottom out piston being a part of the piston that is "formed on" the piston rod

Petition (Paper 2) at 53; Petitioner's Reply (Paper 18) at 26-27; Chen (Ex. 1007) at FIGs. 4-5

Instituted Grounds 5A & 5B

**Ground 5A: Gartner anticipates
claims 1-5, 9 & 19**

**Ground 5B: Gartner in view of Kodama
renders claim 4 obvious**

Petition (Paper 2) at 3-4, 105-116; Institution Decision (Paper 11) at 47-50

'223 Patent & Invalidating Prior Art

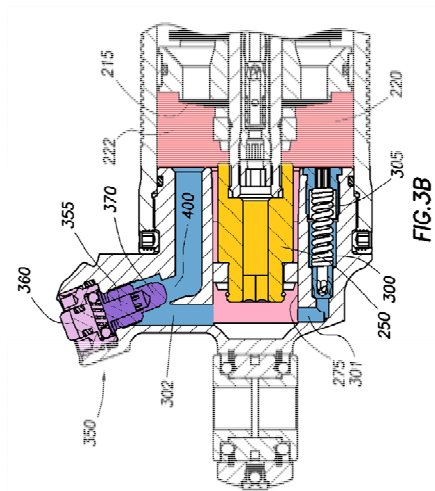
Bottom Out Piston (Gold)

Fluid Flow Paths (Blue)

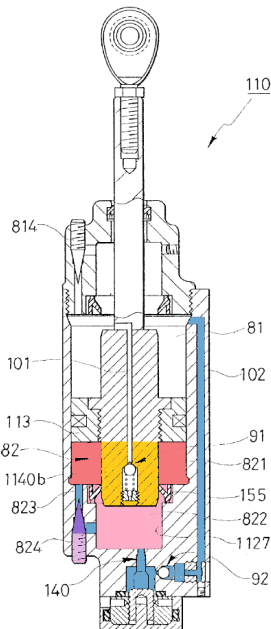
Bottom Out Cup (Pink)

Compression Chamber (Red)

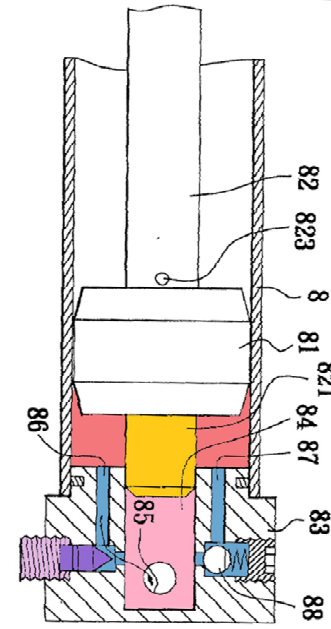
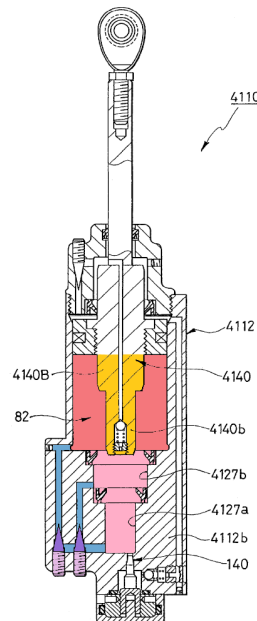
Externally-Adjustable Valve (Purple)



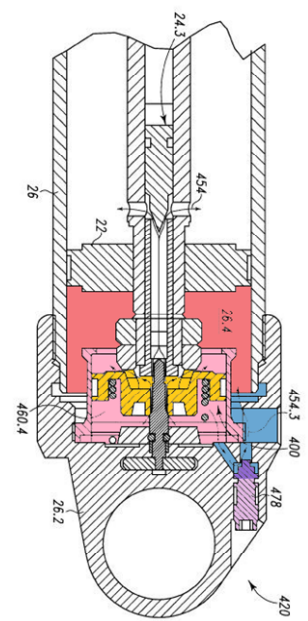
'223 Patent



Nakaya's First & Fourth Embodiments



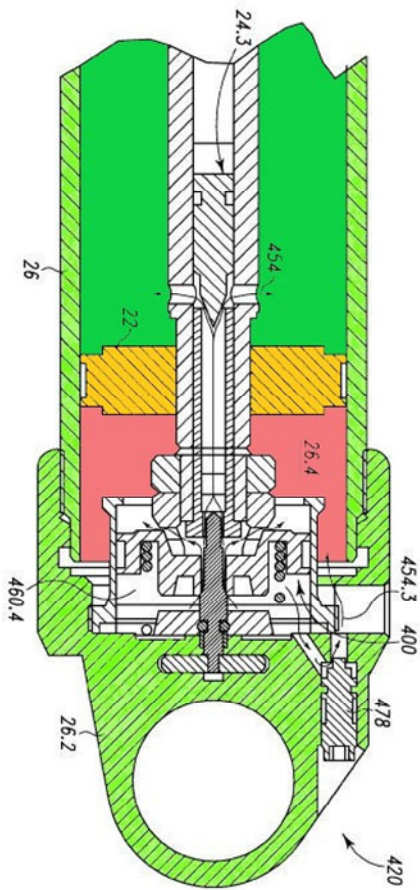
Chen



Gartner

Petition (Paper 2) at 12-15, 21-24, 29-33, 41-46, 50-55, 68-71, 74-76, 105-110

Ground 5: Gartner

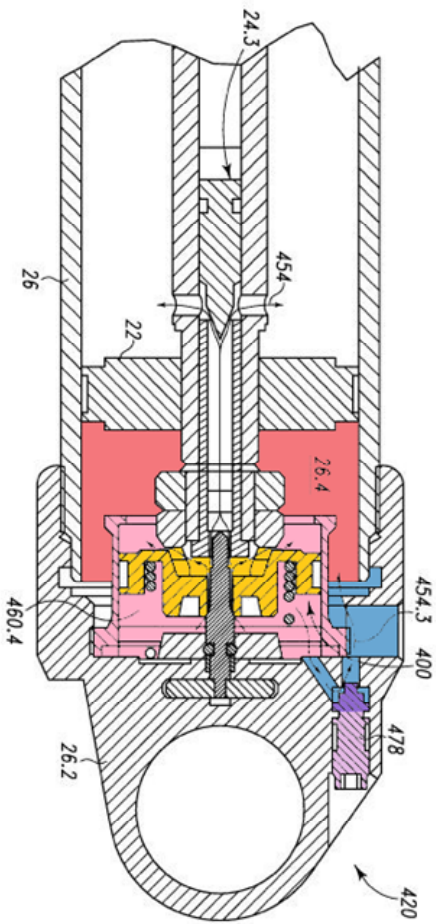


- Gartner discloses a damper having bottom out resistance facilitated by “multiple fluid flowpaths during compression” for a shock absorber 420
- The damper is formed within the volume of the cylinder 26 (light green) that is capped on one end by an end cap 26.2 (light green)
- A piston 22 (gold) divides this volume into a compression portion 26.5 (dark green) and a rebound portion 26.4 (red)

Petition (Paper 2) at 105-106; Wang Decl. (Ex. 1002) at ¶¶ 70-72; Wesling Decl. (Ex. 1003) at ¶¶ 70-72; Gartner (Ex. 1010) at FIG. 12A

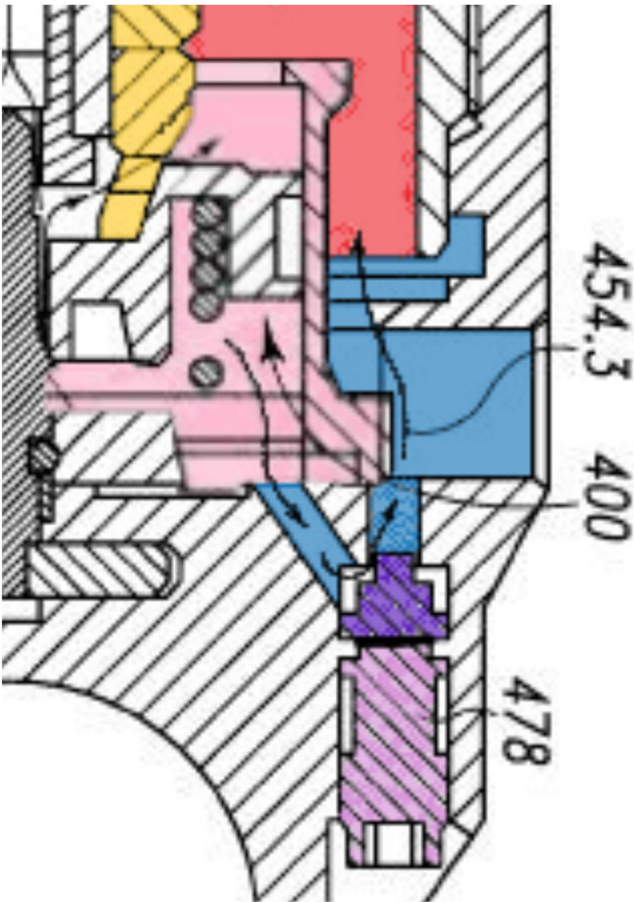
Ground 5: Gartner

- Gartner includes:
 - the claimed bottom out cup as additional compression volume 460.4 (pink),
 - the use of an auxiliary path 454.3 (dark blue with black arrows) from the bottom out cup 460.4, extending into the compression portion (red), and
 - a screw type needle valve 478 (needle [dark purple], screw [light purple]) that is externally actuated to adjust the auxiliary path 454.3



Petition (Paper 2) at 105-106; Wang Decl. (Ex. 1002) at ¶¶ 70-72; Wesling Decl. (Ex. 1003) at ¶¶ 70-72; Gartner (Ex. 1010) at FIG. 12A

Ground 5: Gartner



- During a compression stroke, fluid flows from the bottom out cup (pink) to the compression portion (red) as clearly illustrated by Gartner's black arrows
- Claims 1 and 19 do not require “a bottom out piston formed on the movable rod” as recited in claim 17

Petition (Paper 2) at 109-110; Wang Decl. (Ex. 1002) at ¶ 180; Wesling Decl. (Ex. 1003) at ¶ 175; Institution Decision (Paper 11) at 11-15; Gartner (Ex. 1010) at FIG. 12A

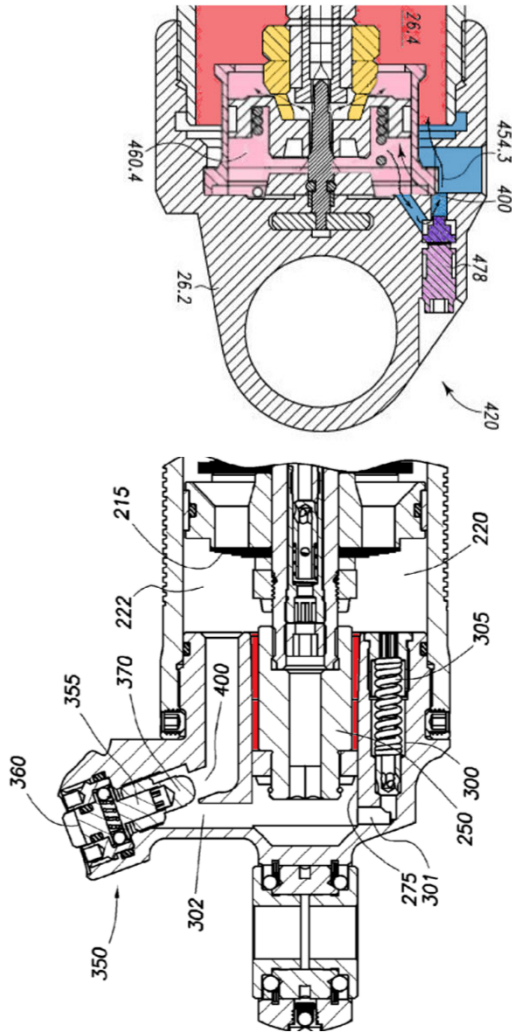
Ground 5: Gartner



The piston only engages the bottom out cup at the end of the compression stroke, as illustrated here

SRAM DEMONSTRATIVE EXHIBIT - NOT EVIDENCE **LEWIS RICE** 64

Ground 5: Gartner



- The compression region 460.4 for Gartner's bottom out cup 260, 460 (pink) is the same as that in the '223 patent
- During a rebound stroke of the embodiment depicted in the '223 patent, the area within the bottom out cup 275 around the bottom out piston 250 is a rebound chamber (red)
- Gartner discloses a bottom out cup that is active only at the end of the stroke of the shock absorber 420

Petitioner's Reply (Paper 18) at 27-30; '223 patent (Ex. 1001) at FIG. 3B; Gartner (Ex. 1010) at FIG. 12A

Conclusion

'223 Patent & Invalidating Prior Art

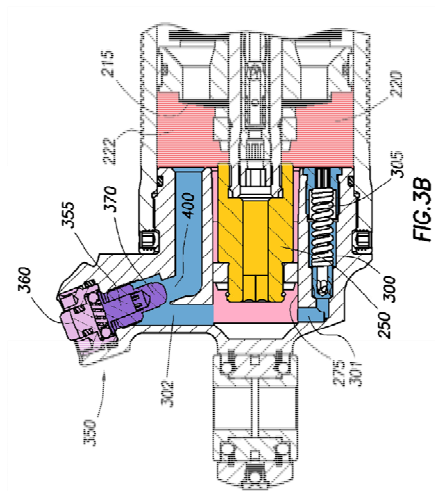
Bottom Out Piston (Gold)

Fluid Flow Paths (Blue)

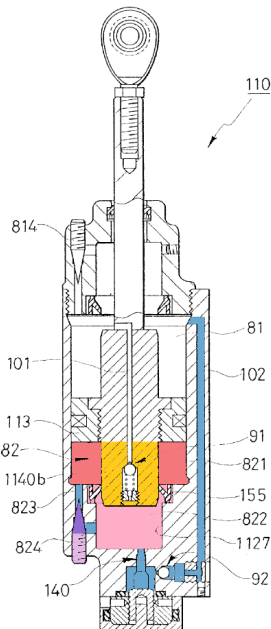
Bottom Out Cup (Pink)

Compression Chamber (Red)

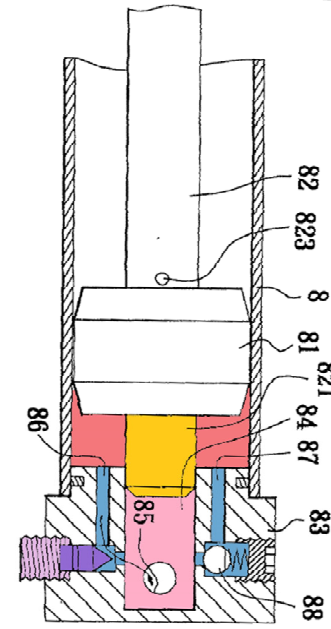
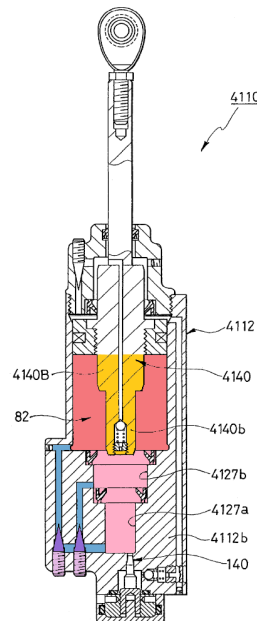
Externally-Adjustable Valve (Purple)



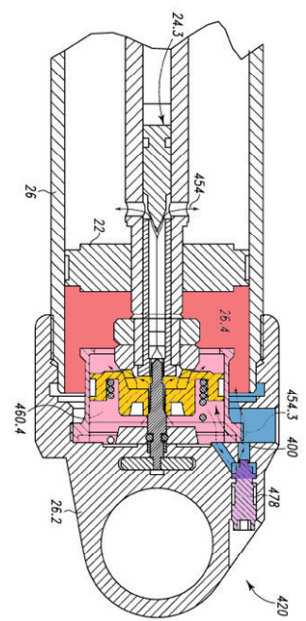
'223 Patent



Nakaya's First & Fourth Embodiments



Chen



Gartner

Petition (Paper 2) at 12-15, 21-24, 29-33, 41-46, 50-55, 68-71, 74-76, 105-110

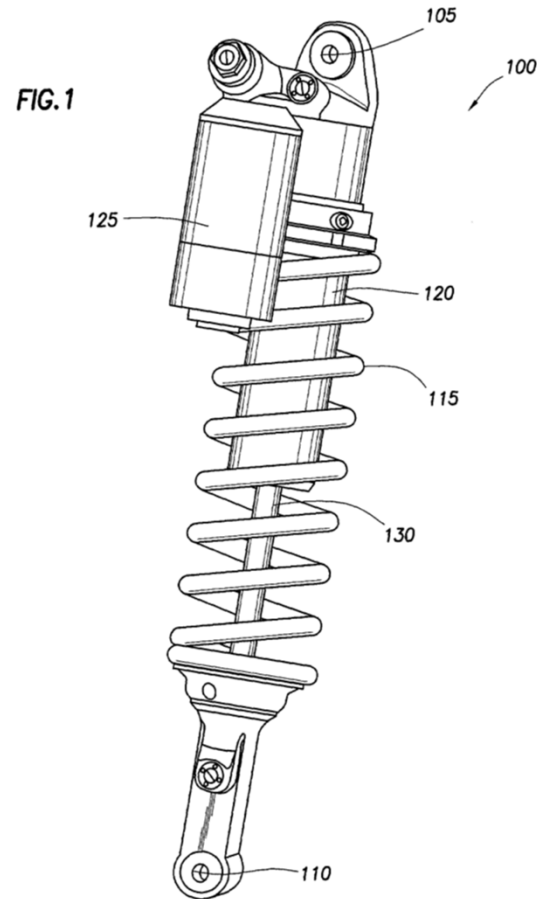
Conclusion

SRAM respectfully requests that the Board issue a final written decision confirming the unpatentability of claims 1-9, 11-15, and 19 of the '223 patent.

Petition (Paper 2) at 118

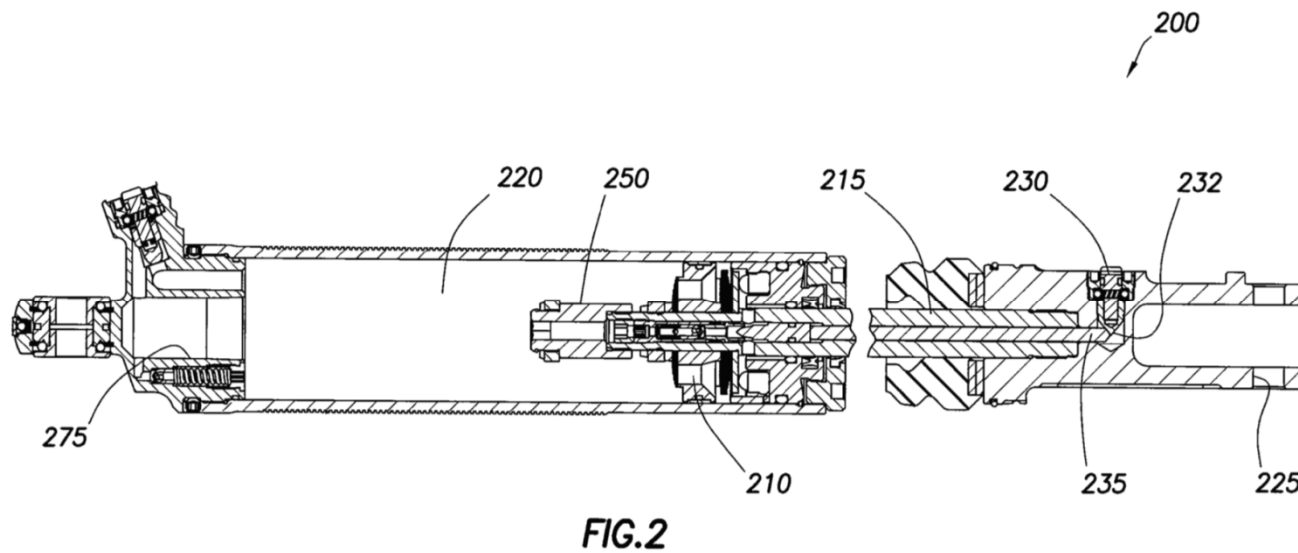
Figures of the '223 patent

'223 Patent – Figure 1



'223 patent (Ex. 1001), FIG. 1

'223 Patent – Figure 2



'223 patent (Ex. 1001), FIG. 2

'223 Patent – Figures 3A and 3B

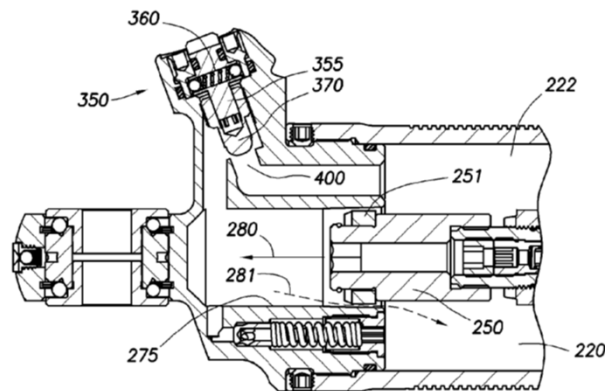


FIG. 3A

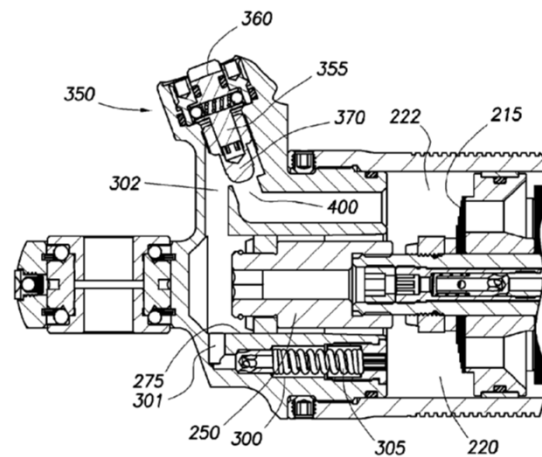
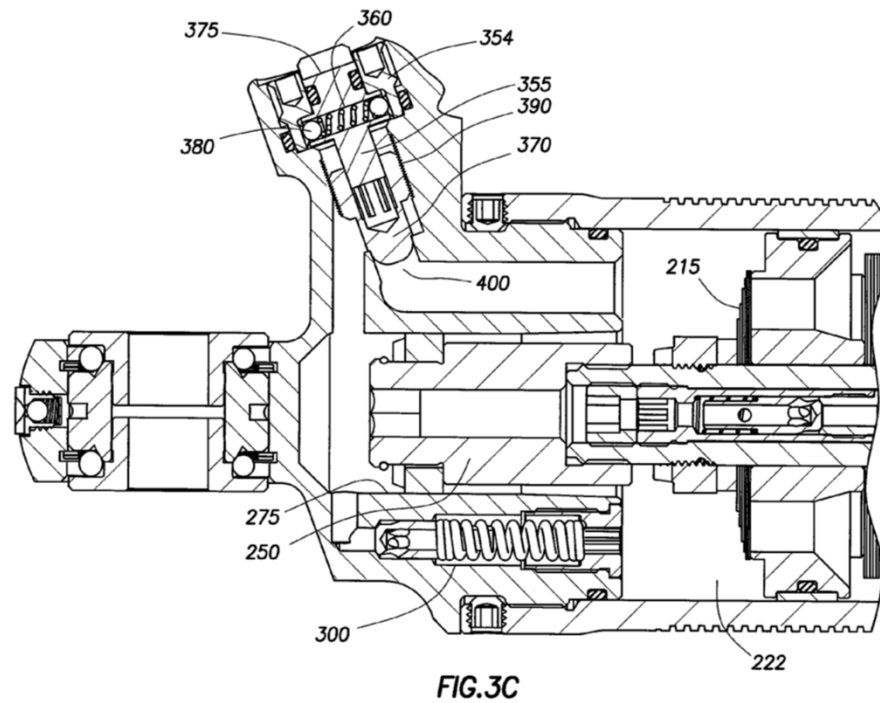


FIG. 3B

'223 patent (Ex. 1001), FIGs. 3A, 3B

'223 Patent – Figure 3C



'223 patent (Ex. 1001), FIG. 3C

'223 Patent – Figure 4

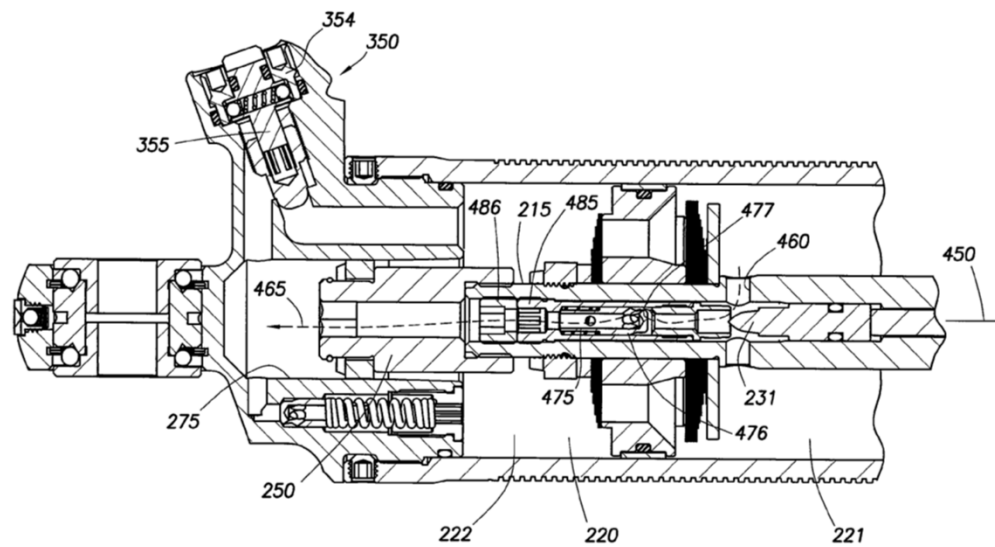


FIG. 4

'223 patent (Ex. 1001), FIG. 4

Claims of the '223 patent

Independent Claim 1 – Challenged

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.

'223 patent (Ex. 1001), 7:39-48

Dependent Claim 2 – Challenged

2. The damper of claim 1, wherein the capacity of the flow path is adjustable with an adjustable valve, the valve restricting the fluid flow.

'223 patent (Ex. 1001), 7:49-51

Dependent Claim 3 – Challenged

3. The damper of claim 2, wherein the adjustable valve is manually adjustable and accessible externally of the damper.

'223 patent (Ex. 1001), 7:52-53

Dependent Claim 4 – Challenged

4. The damper of claim 3, wherein the adjustable valve can be adjusted between a closed position and a plurality of open positions.

'223 patent (Ex. 1001), 7:54-56

Dependent Claim 5 – Challenged

5. The damper of claim 1, further including a fluid path between the cup and the rebound portion of the chamber, the path formed in the shaft.

'223 patent (Ex. 1001), 7:57-59

Dependent Claim 6 – Unchallenged

6. The damper of claim 5, wherein the path between the cup and rebound portion is adjustable with a check valve to permit flow of fluid in a single direction between the cup and the rebound portion.

'223 patent (Ex. 1001), 7:60-63

Dependent Claim 7 – Unchallenged

7. The damper of claim 6, wherein the check valve is arranged in the path to permit fluid communication between the rebound portion and the cup during a rebound stroke of the shaft.

'223 patent (Ex. 1001), 7:64-67

Dependent Claim 8 – Unchallenged

8. The damper of claim 7, wherein the volume of fluid traveling through the fluid path is user-adjustable.

'223 patent (Ex. 1001), 8:1-2

Dependent Claim 9 – Challenged

9. The damper of claim 1, further including a second fluid flow path within the bottom out cup.

'223 patent (Ex. 1001), 8:3-4

Dependent Claim 10 – Unchallenged

10. The damper of claim 9, further including a blow off valve disposed in the second fluid flow path, the blow off valve having a predetermined blow off threshold pressure.

'223 patent (Ex. 1001), 8:5-7

Independent Claim 11 – Challenged

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.

'223 patent (Ex. 1001), 8:8-23

Dependent Claim 12 – Challenged

12. The damper of claim 11, wherein in the second position the bottom out piston is sealingly engaged within the bottom out cup.

'223 patent (Ex. 1001), 8:24-26

Dependent Claim 13 – Challenged

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.

'223 patent (Ex. 1001), 8:27-30

Dependent Claim 14 – Challenged

14. The damper of claim **13**, further including an externally accessible adjuster connected to a valve disposed in the flow path.

'223 patent (Ex. 1001), 8:31-33

Dependent Claim 15 – Challenged

15. The damper of claim **14**, wherein the externally accessible adjuster is manually adjustable.

'223 patent (Ex. 1001), 8:34-35

Dependent Claim 16 – Unchallenged

16. The damper of claim **13**, further including a second fluid flow path within the bottom out cup and the compression portion.

'223 patent (Ex. 1001), 8:36-38

Independent Claim 17 – Unchallenged

17. A shock absorber comprising:
a spring;
a chamber operatively connected to the spring;
a piston shaft extending into the chamber;
a first piston connected to the shaft, the piston for metering fluid during movement of the shaft in the chamber between a compression side and a rebound side of the chamber;
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;
a blow off valve in a fluid path formed in the bottom out cup for fluid communication with compression side, the blow off valve operable depending upon the pressure of fluid in the bottom out cup during a compression stroke of the shock absorber; and
a user-adjustable metering valve in a second fluid path for metering fluid from the bottom out cup to the compression side, the valve externally accessible to increase or decrease dampening.

'223 patent (Ex. 1001), 8:39-58

Dependent Claim 18 – Unchallenged

18. The shock absorber of claim **17**, wherein the chamber comprises a cylinder.

'223 patent (Ex. 1001), 8:59-60

Independent Claim 19 – Challenged

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.

'223 patent (Ex. 1001), 8:61-9:5