

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WIRTGEN AMERICA, INC.,
Petitioner,

v.

CATERPILLAR INC.,
Patent Owner.

IPR2022-01395
Patent 7,523,995 B2

Before BARRY L. GROSSMAN, JAMES J. MAYBERRY, and
MATTHEW S. MEYERS, *Administrative Patent Judges*.

MAYBERRY, *Administrative Patent Judge*.

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

I. INTRODUCTION

Wirtgen America, Inc. (“Petitioner”), filed a Petition requesting *inter partes* review of claims 1–15, 17–33, 35–42, 44–61, and 63 (the “Challenged Claims”) of U.S. Patent No. 7,523,995 B2 (Ex. 1001, the “’995 patent”). Paper 2 (“Pet.”), 1.¹ The ’995 patent is owned by Caterpillar Inc. (“Patent Owner”). Paper 4, 1.

For the reasons provided below, we conclude that Petitioner has proven, by a preponderance of the evidence, that claims 1–15, 17–33, 35–42, and 44 are unpatentable. We conclude Petitioner has not proven, by a preponderance of the evidence, that claims 45–61, and 63 are unpatentable.

A. *Procedural History*

Upon review of the Petition, Preliminary Patent Owner Response (Paper 7), and evidence in the record, we instituted an *inter partes* review proceeding on all challenges in the Petition. Paper 9 (“Inst. Dec.”); *see* 37 C.F.R. § 42.108(a) (2023) (“When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”).

Patent Owner filed a Response to the Petition. Paper 14 (“PO Resp.”). Petitioner filed a Reply to the Patent Owner Response. Paper 18 (Pet. Reply). Patent Owner filed a Sur-reply to the Reply. Paper 22 (“PO Sur-reply”).

An oral hearing was held on December 11, 2023, and a transcript is included in the record. Paper 26 (“Tr.”).

¹ Petitioner challenges claims 18, 21–35, 45, and 49–63 of the ’995 patent in IPR2022-01394. We issue a Final Written Decision in that proceeding concurrently with this Decision.

B. Real Parties-in-Interest

Petitioner identifies Wirtgen America, Inc. and Wirtgen GmbH as the real parties-in-interest. Pet. 95. Patent Owner identifies Caterpillar Inc. as the real party-in-interest. Paper 4, 1.

C. Related Matters

The parties each identify the following district court litigation as a matter related to the '995 patent: *Wirtgen America Inc. v. Caterpillar Inc.*, Case No. 1:17-cv-00770 (D. Del.). Pet. 96; Paper 4, 1. Patent Owner also identifies the following *inter partes* review cases as matters related to the '995 patent: IPR2022-01394, IPR2022-01396, and IPR2022-01397. Paper 4, 1.

D. The '995 Patent

The '995 patent, titled “Milling Machine,” issued on April 28, 2009, from application number 11/180,688. Ex. 1001, codes (54), (45), (21). The '995 patent ultimately claims priority to a foreign application, Italian Patent Application No. TO2004A0499, filed on July 15, 2004. *Id.* at code (30).

The '995 patent relates to “work machines for the treatment of roadway surfaces, and more particularly to a road planer or milling machine.” Ex. 1001, 1:5–6. Figure 1 is illustrative and is reproduced below.

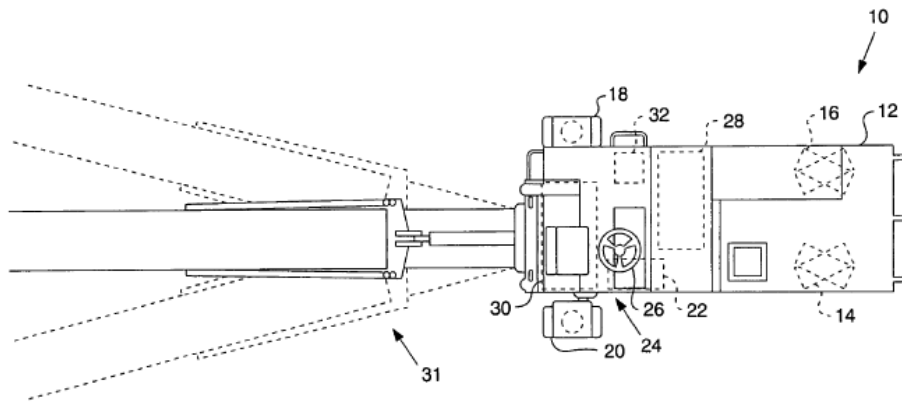


Figure 1 of the '995 patent depicts a top plan view of a self-propelled work machine. Ex. 1001, 3:26–28, 3:43–44, Fig. 1. As shown, self-propelled work machine 10 includes machine frame 12 supportable by front ground engaging units 14 and 16, and rear ground engaging units 18 and 20. *Id.* at 3:43–48. “[R]ight rear ground engaging unit 20 . . . may be pivotable between a projecting position as shown in solid lines in F[igure] 1 and a retracted position in which the one ground engaging unit 20 is positioned within the frame 12 as indicated by the recess 22 shown in hidden lines.” *Id.* at 3:51–56.

Figures 2 through 4 illustrate an exemplary embodiment of the '995 patent. Ex. 1001, Figs. 2–4; *see id.* at 4:38–44. Figure 2 is reproduced below.

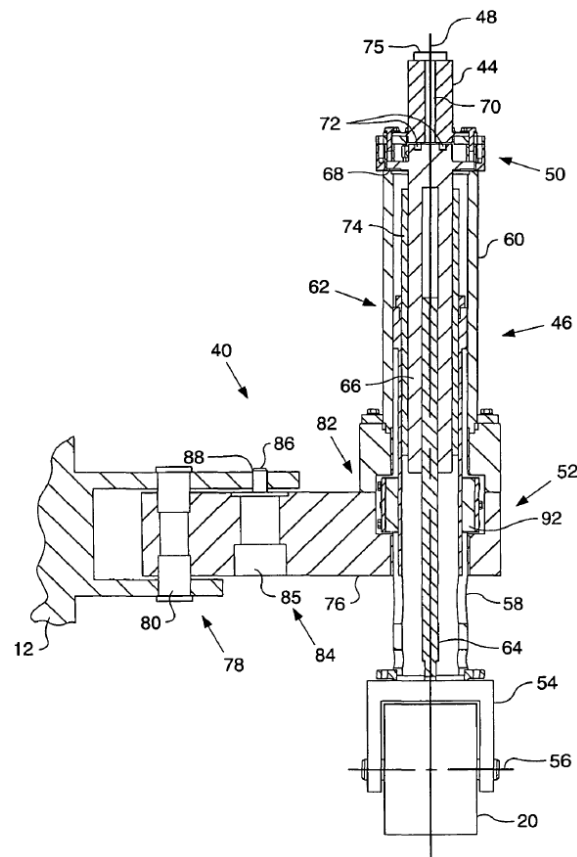


Figure 2 of the '995 patent depicts a partially sectioned longitudinal view of a detail of the work machine shown in Figure 1, referred to as “a cold planer.” Ex. 1001, 3:29–31, Fig. 2. As shown, “work machine 10 includes . . . support device 40 connected between the machine frame 12 and the one ground engaging unit 20”; “first actuator 42 is connected to the support device 40 and is adapted to move the one ground engaging unit 20 between the projecting . . . and the retracted position . . . relative to . . . frame 12”; “second actuator 44 is associated with . . . support device 40 and . . . adapted to maintain the same rotational direction of the one ground engaging unit 20 in each of the projecting and retracted positions”; “controller 32 . . . is adapted to coordinate the actuation of . . . actuators 42, 44”; “support device 40 includes . . . lifting column 46 adapted to controllably raise and

lower the associated connected ground engaging unit 20 relative to the machine frame 12”; and “second actuator 44 is connected to . . . lifting column 46 and . . . adapted to cause . . . a portion of . . . lifting column 46 to rotate about . . . lifting column axis 48,” which “is oriented generally vertically relative to . . . work machine 12.” *Id.* at 4:38–60.

“When flush milling is desired, for example, along a curb or close to a wall, the operator may choose to move the one ground engaging unit 20 to the retracted position relative to the machine frame 12.” Ex. 1001, 7:56–59. Figure 3 is illustrative and reproduced below.

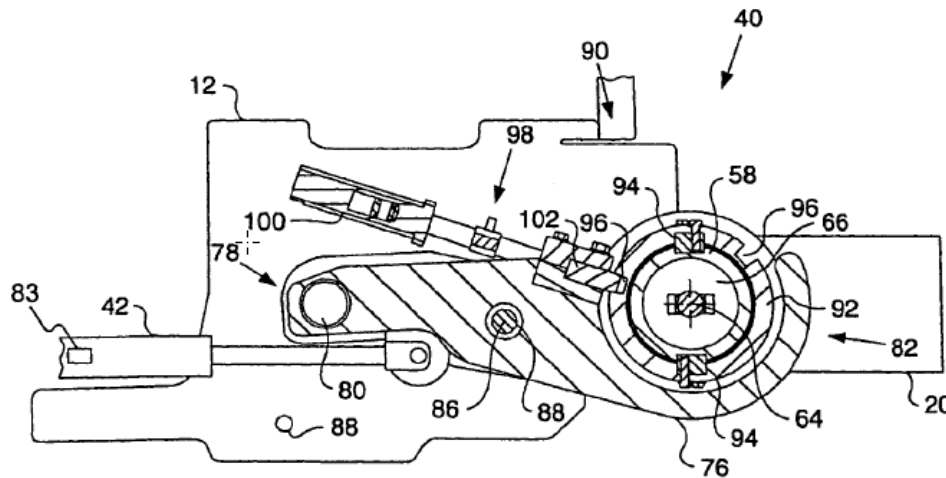


Figure 3 of the '995 patent depicts “a partially sectioned top plan view of the apparatus of FIG. 2, with the ground engaging unit arranged in a retracted position relative to the frame.” Ex. 1001, 3:32–34, Fig. 3.

“Absent conditions calling for flush milling, the work machine 10 may be configured as shown in FIG. 4, with the one ground engaging unit 20 in the projecting or outboard position relative to the machine frame 12.” Ex. 1001, 7:49–52. Figure 4 is illustrative and is reproduced below.

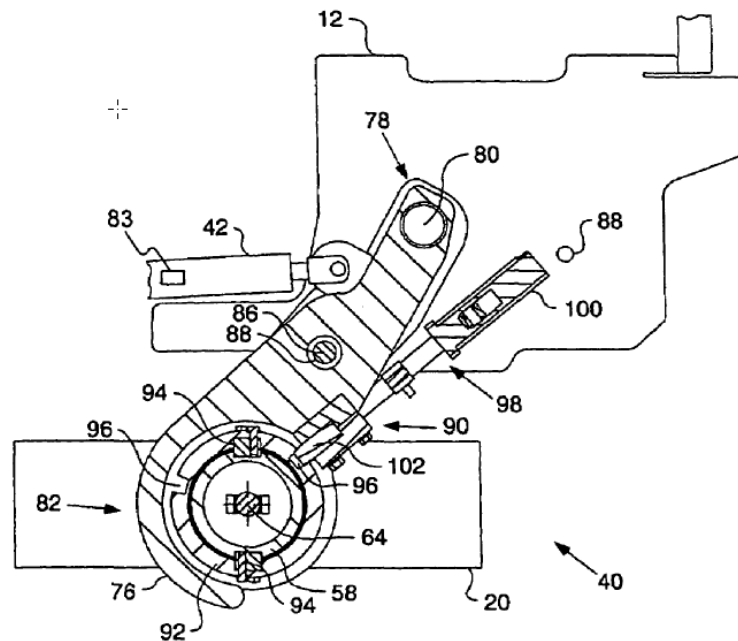


Figure 4 of the '995 patent depicts “a partially sectioned top plan view of the apparatus of FIG. 2, with the ground engaging unit arranged in a protracting position relative to the frame.” *Id.* at 3:35–37.

E. Challenged Claims

The Petition challenges claims 1–15, 17–33, 35–42, 44–61, and 63.

Pet. 1. Below, we reproduce independent claims 1, 18, 36, and 45.

1. A self-propelled machine, comprising:

a machine frame supportable by a plurality of ground engaging units;

a support device connected between said machine frame and at least one of said ground engaging units, the support device including a lifting column having a lifting column axis oriented generally vertically relative to the machine frame, the lifting column being configured to controllably raise and lower said at least one ground engaging unit relative to the machine frame;

a first actuator connected to said support device and located at a lower portion of the lifting column, and adapted to move said at least one ground engaging unit between projecting and retracted positions relative to said machine frame;

a second actuator associated with said at least one ground engaging unit, wherein the second actuator is a rotary actuator located at an upper portion of the lifting column spaced apart from the first actuator along the lifting column axis, and adapted to cause at least a portion of the lifting column to rotate about the lifting column axis and to maintain the same rotational direction of said at least one ground engaging unit in each of said projecting and retracted positions; and

a controller associated with and adapted to coordinate the actuation of said first and second actuators.

Ex. 1001, 9:62–10:21.

18. A self-propelled machine, comprising:

a machine frame supportable by a plurality of ground engaging units;

a support device connected between said machine frame and at least one of said ground engaging units, said support device including a lifting column having a lifting column axis and being adapted to controllably raise and lower said at least one ground engaging unit about said axis relative to said machine frame;

a first actuator connected to said support device and adapted to move said at least one ground engaging unit between projecting and retracted positions relative to said machine frame; and

a second actuator connected to said lifting column and adapted to cause at least a portion of said lifting column to rotate about said lifting column axis relative to said machine frame, said second actuator being positioned at a location linearly spaced apart from said first actuator along said lifting column axis.

Id. at 11:34–52.

36. A method of controlling a pair of actuators connected to a controller, at least one of said actuators being a rotary actuator, to selectively position one of a plurality of ground engaging units connected to a respective lifting column having a lifting column

axis and supporting a frame of a self-propelled machine, comprising:

raising said one ground engaging unit with said lifting column until said one ground engaging unit is free from engagement with the ground;

actuating a first one of said actuator pair to move said one ground engaging unit from one to the other of said projecting and retracted positions relative to said machine frame;

actuating a second one of said actuator pair to rotate said one ground engaging unit about said lifting column axis in a manner coordinated with the actuation of said first actuator to maintain the same rotational direction of said ground engaging unit in each of said projecting and retracted positions wherein said first one of said actuator pair and said second one of said actuator pair are positioned at locations spaced apart axially along said lift column axis; and

lowering said one ground engaging unit with said lifting column until said one ground engaging unit is again in frame supporting engagement with the ground.

Id. at 13:7–31.

45. A self-propelled machine, comprising:

a machine frame supportable by a plurality of ground engaging units;

support means for supporting said machine frame, said support means being connected to said machine frame and including a generally vertically oriented lifting column having a lifting column axis and being connected to at least one of said ground engaging units;

first actuatable means for moving said at least one ground engaging unit between projecting and retracted positions relative to said machine frame;

second actuatable means for rotating said at least one ground engaging unit to maintain the same rotational direction of said at least one ground engaging unit in each of said projecting and retracted positions, said second actuatable means being

positioned at a location spaced apart from said first actuatable means along an axis of said lifting column; and controller means for coordinating the actuation of said first and second actuatable means.

Id. at 14:31–50.

F. Prior Art and Asserted Grounds

Petitioner asserts that the Challenged Claims are unpatentable based on three grounds:

Claims Challenged	35 U.S.C. §²	References/Basis
18–20, 29–31, 33	103(a)	Bitelli, ³ Feliz ⁴
1–9, 11–15, 17, 21–27, 32, 35–40, 42, 44–55, 57–61, 63	103(a)	Bitelli, Feliz, Skotnikov ⁵
10, 28, 41, 56	103(a)	Bitelli, Feliz, Skotnikov, McColl ⁶

Pet. 17–18.

Petitioner relies on the declaration testimony of Cameron Orr (Ex. 1003) in support of these grounds.

The following subsections provide brief descriptions of the asserted prior art references.

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 296–07 (2011), took effect on September 16, 2011, with changes to 35 U.S.C. §§ 102 and 103 taking effect March 16, 2013. Because neither party disputes that the application for the patent at issue in this proceeding has an effective filing date before March 16, 2013, we refer to the pre-AIA version of the statute.

³ Bitelli, EP 1001088 A2; published May 17, 2000 (Ex. 1011, “Bitelli”).

⁴ Feliz, US 4,167,826; issued Sept. 18, 1979 (Ex. 1012, “Feliz”).

⁵ Skotnikov et al., US 6,311,795 B1; issued Nov. 6, 2001 (Ex. 1008, “Skotnikov”).

⁶ McColl, US 4,237,994; issued Dec. 9, 1980 (Ex. 1010, “McColl”).

1. *Bitelli (Ex. 1011)*

Bitelli, titled “Scarifying machine with Re-Entering Back Wheels,” published May 17, 2000. Ex. 1011, codes (54), (43). Bitelli relates to “a scarifying machine for soil removal in which the shift operation of the back wheels from the projecting position to the re-entering position with respect to the frame is made in an automatized way.” *Id.* ¶ 11. Figure 1 of Bitelli is reproduced below.

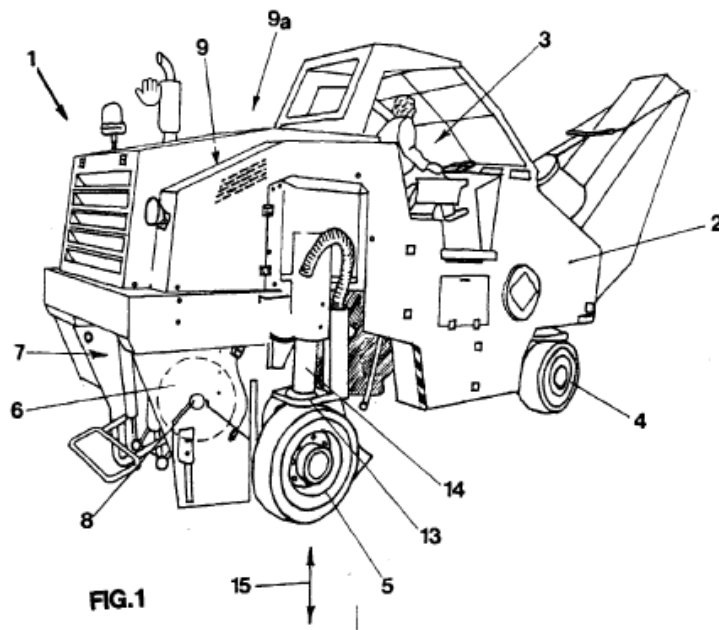


Figure 1 of Bitelli depicts a scarifier in an axonometric view. Ex. 1011 ¶ 17. As shown, scarifying machine 1 has, for example, frame 2, in which there is driving place 3, front wheel 4 and back wheel 5, and hydraulic jack 14 connected to wheel 5 for lifting and lowering the machine. *Id.* ¶¶ 18, 23, claim 8. Back wheel 5 is supported by articulation unit 10. *Id.* ¶ 21.

Figures 2 and 3 of Bitelli are reproduced below.

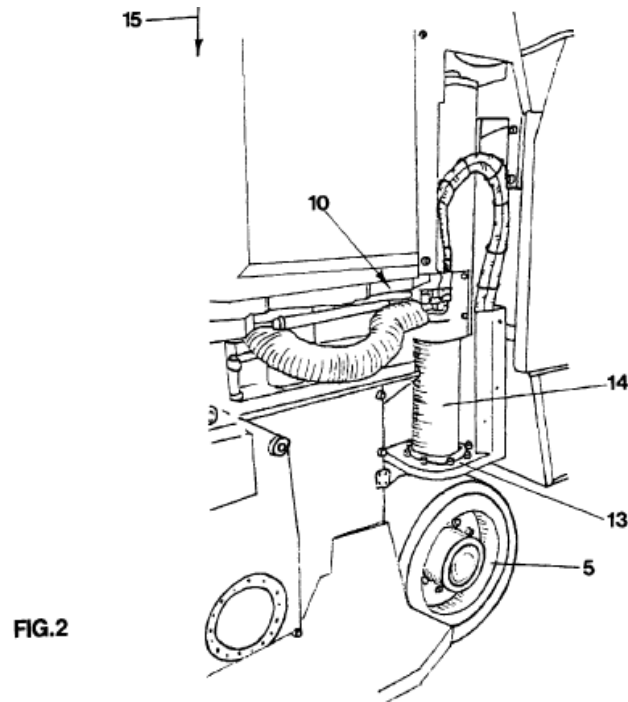


Figure 2 of Bitelli depicts a detail of the scarifying machine 1. Ex. 1011 ¶ 17. As shown, articulation unit 10 is fixed to frame 2 of scarifying machine 1 and connected to plate 13 supporting back wheel 5 via hydraulic jack 14. *Id.* ¶¶ 22–23.

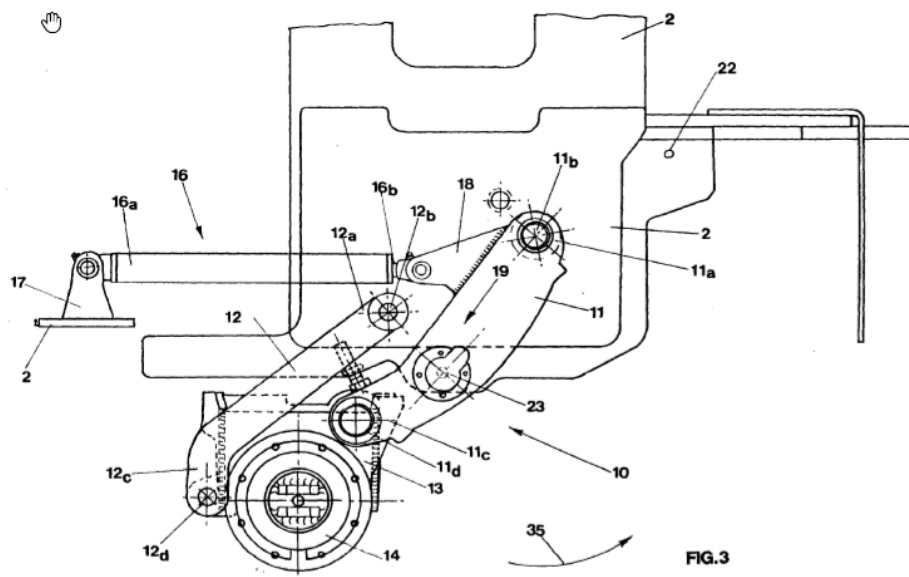


Figure 3 of Bitelli depicts a top view of a detail of the scarifying machine. Ex. 1011 ¶ 17. As shown, articulation unit 10 cooperates with a first actuator 16—for example, a hydraulic cylinder—“to shift said articulation unit 10 in order to place the respective wheel 5 from a position laterally projecting from said frame 2 to a position re-entering with respect to the frame 2 and vice versa.” *Id.* ¶¶ 24, 25. Bitelli describes that “[w]hen the oil under pressure flowing in the pipe . . . reaches the first hydraulic ram 16, it causes the release of the said first hydraulic ram 16 from the stem 16a . . . , forcing the articulation unit to rotate according to the counterclockwise direction shown by the arrow 35 in fig. 3.” *Id.* ¶ 36. Accordingly, Figure 3 of Bitelli shows back wheel 5 in the laterally projecting position, whereas Figure 4, reproduced below, shows back wheel 5 having been rotated to an intermediate position.

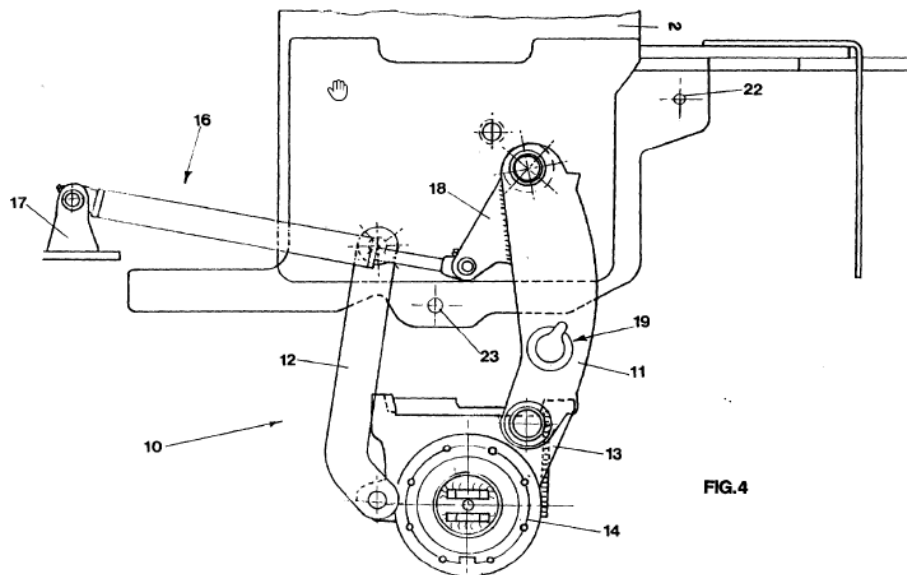


Figure 4 of Bitelli depicts back wheel 5 in an intermediate position, with the first arm 11 and second arm 12 extended from frame 2. Ex. 1011 ¶ 37.

Figure 5 of Bitelli, reproduced below, shows back wheel 5 rotated to its final, re-entering position.

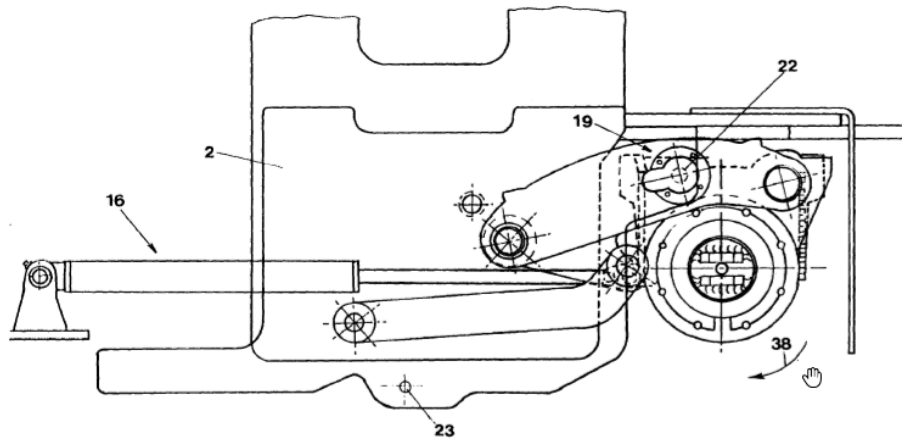


FIG.5

Figure 5 of Bitelli depicts back wheel 5 locked in a final, re-entering position. Ex. 1011 ¶¶ 17, 24, 37. “[A]rticulation unit 10 is made [to] rotate according to the clockwise direction as shown in [Figure] 5 by the arrow 38 when the oil under pressure . . . acts in the first hydraulic ram 16 making the stem 16a re-enter according to the direction shown by the arrow 40.” *Id.* ¶ 41, Fig. 9.

Bitelli’s “articulation unit includes also second actuator means making the articulation unit fixed with respect to the machine frame when the respective wheel is placed in a projecting position or in a re-entering position with respect to the frame.” Ex. 1011 ¶ 15.

Figure 6 of Bitelli is illustrative and reproduced below.

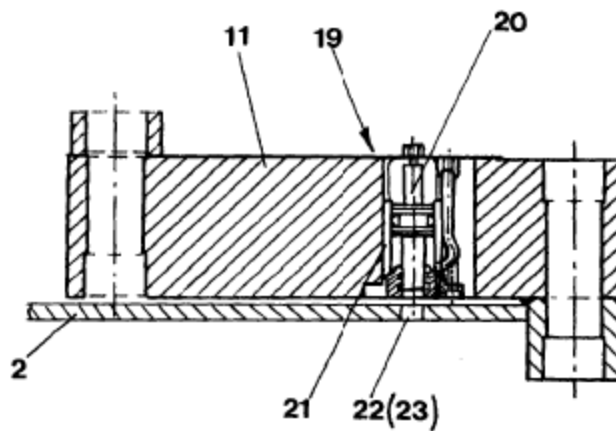


Figure 6 of Bitelli depicts a second actuator of the scarifying machine. Ex. 1011 ¶¶ 17, 26–29. As shown, Bitelli’s “second actuator . . . consist[s] in a second hydraulic cylinder 19,” which is “formed substantially by a stem 20 . . . coupled in a sliding way to the inside of a cylindrical seat 21 included in the body of the first arm 11.” *Id.* ¶ 26. The “stem 20 is suitable to be housed in respective holes 22, 23 included in the frame.” *Id.*

Figure 8 of Bitelli is reproduced below.

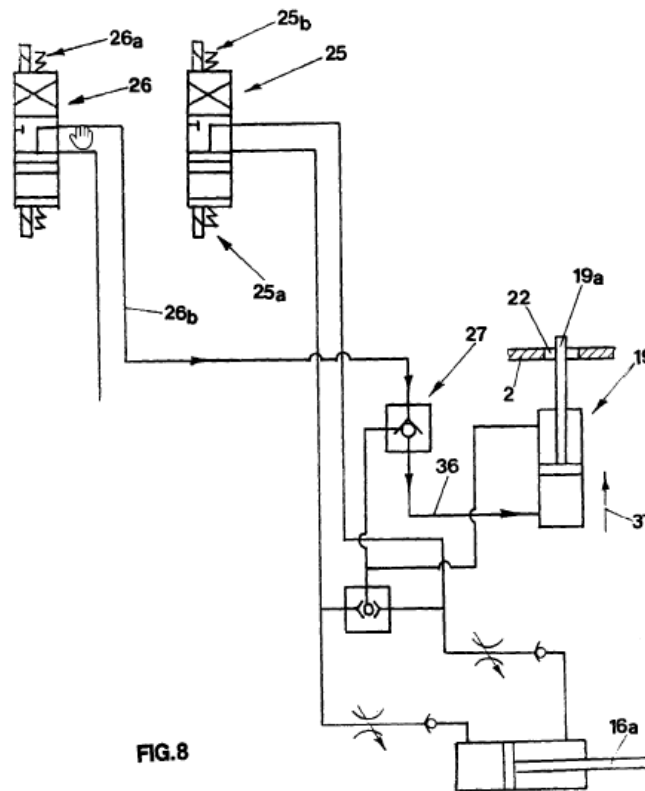


Figure 8 of Bitelli depicts the drive and shifting hydraulic circuit of the scarifying machine's back wheels 5 in one configuration. Ex. 1011 ¶ 17. As shown, "oil under pressure . . . feeds the second hydraulic ram 19 whose stem 19a is shifted . . . into the hole 22 of the frame 2 granting the locking of the articulation unit 10 and of the wheel 5, integral with it, in the entering position." *Id.* ¶ 39.

Figure 7 of Bitelli is reproduced below.

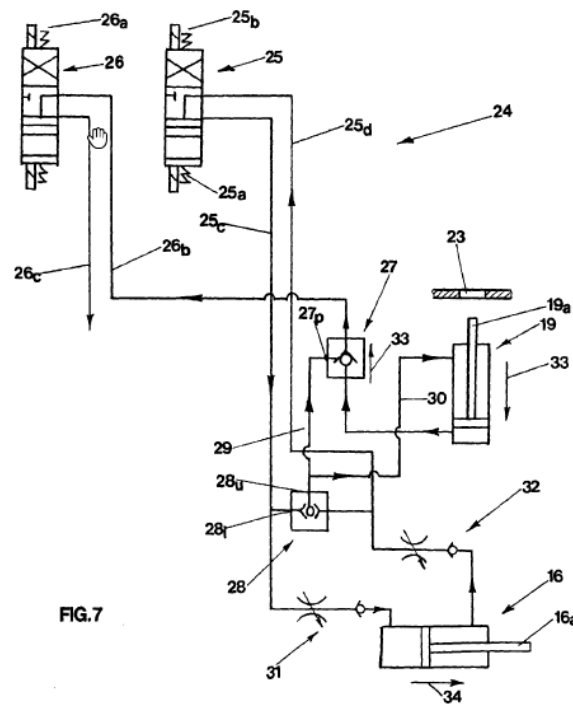


Figure 7 of Bitelli depicts the drive and shifting hydraulic circuit of the scarifying machine's back wheels 5 in another configuration. Ex. 1011 ¶ 17. As shown, “oil under pressure, acting . . . on the second hydraulic ram 19, shifts the stem 19a of the said second hydraulic ram 19 . . . [,] releasing it from the hole 23 made on the frame 2,” such that “[t]he articulation unit 10 is therefore free to move with respect to the frame 2.” *Id.* ¶¶ 35, 36.

2. *Feliz* (Ex. 1012)

Feliz, titled “Self-Loading Dualistic Earth Excavator with Connecting Telescopic Conveying and Dualistic Distribution Means,” issued September 18, 1979. Ex. 1012, codes (54), (45).

Feliz “relates to the improvement of a self-loading earth excavating, conveying and distribution vehicles, normally associated with cut and fill

construction of highways and earth dams, open pit mining and the like.” *Id.* at 1:17–21. Figure 1 of Feliz is reproduced below.

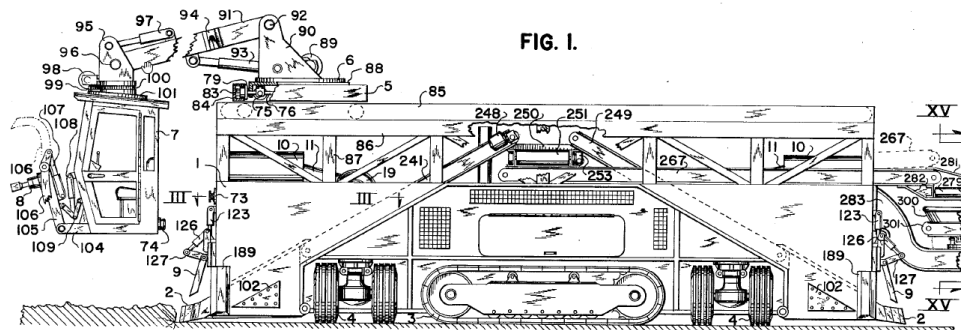


Figure 1 of Feliz depicts a side view of a dualistic earth excavation vehicle. Ex. 1012, 5:31–35. As shown, vehicle 1 includes four pairs of auxiliary drive wheels 4 connected to the frame of the vehicle by way of joints, shafts, and housings. *Id.* at 7:62–8:2; *see id.* at 8:12–9:46.

Figure 4 of Feliz is reproduced below.

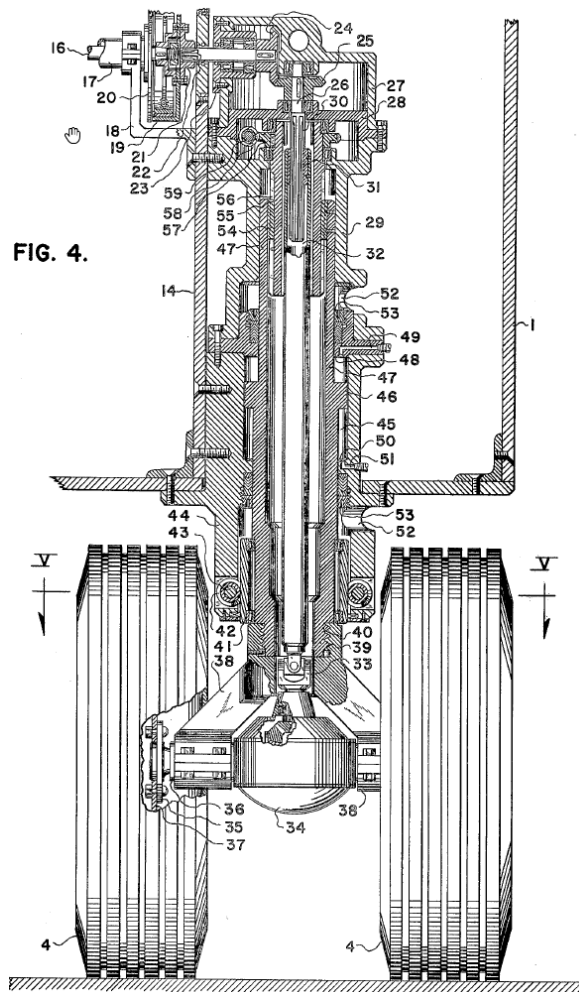


Figure 4 of Feliz provides a more detailed view of the auxiliary wheel drive, steering, and jack mechanisms. Ex. 1012, 5:48–51. Notably, Figure 4 shows upper and lower gear covers 27 and 28 secured to upper pedestal housing 29, which is secured to wing wall 14 along with lower pedestal housing 44. *Id.* at 8:21–24, 8:40–41. “[D]rive shaft 32 freely extends or retracts on shaft 26,” and its lower portion is connected by universal joint 33 to conventional differential 34. *Id.* at 8:26–29. Conventional differential 34 is provided with shortened conventional drive shafts 35 secured to wheel rims 37, which drive the wheels 4. *Id.* at 8:31–33. “The jack means . . .

comprises an extensible jack device including a vertical cylinder 45 containing a reciprocable piston 46 having its upper piston skirt 47 extending upwardly through the top cylinder head 48, the latter is provided with a fluid conducting passage 49 with which a liquid supply communicates.” *Id.* at 8:45–51. “[W]hen liquid under pressure is supplied to the lower end of the cylinder bore, the piston 46 may be moved upwardly to retract the drive wheels, thus lowering the vehicle with attached cutterheads 2 and tractor belts 3,” whereas “when liquid under pressure is supplied to the upper cylinder bore through the fluid passage 49, the piston 46 may be moved downwardly until the drive wheels are in ground engagement.” *Id.* at 8:55–63. And by “continuing to apply fluid pressure, the vehicle 1 cutterheads 2 and tractor belts 3 may be raised above ground engagement for highway travel, lateral travel or travel in any other direction desired by the auxiliary drive wheel means.” *Id.* at 8:63–8:67.

Figure 4 of Feliz also shows that “[t]he upper portion of the piston skirt 47 has a splined sleeve 54 secured therein,” which “is slidably engaged at 55 with the splined tubular steering shaft 56.” Ex. 1012, 9:2–5. Steering shaft 56 “is suitably journaled in bearings supported by the upper pedestal housing 29 and the gear cover 28” and “has a worm gear 57 keyed thereto,” which “is driven by the worm 58.” *Id.* at 9:5–9. Worm 58 “is keyed to the horizontal steering shaft 59,” which is “suitably journaled in bearings supported by the pedestal housing 29 and the gear cover 28.” *Id.* at 9:9–12. “The foregoing arrangement permits the piston skirt 47 to extend or retract with the jack means while simultaneously providing a steering means to direction orient the drive wheels 4 in a 360 degree arc” while

“simultaneously transmitting propulsion power to the drive wheels 4.” *Id.* at 9:12–17.

Figure 3 of Feliz is reproduced below.

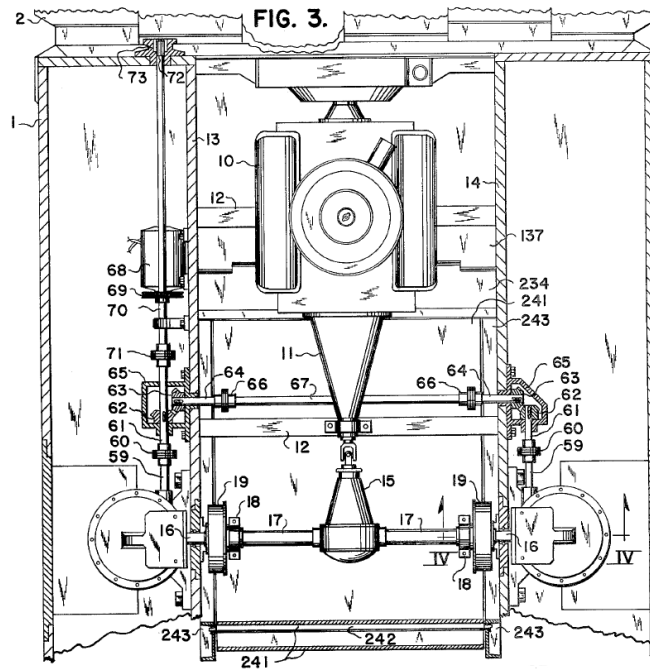


Figure 3 of Feliz depicts a horizontal section of the dualistic earth excavation vehicle illustrating the propulsion and steering power trains of the forward auxiliary drive wheel assembly. Ex. 1012, 5:39–42. As shown, “horizontal steering shaft 59 is driven by flexible coupling 60 in turn driven by shaft 61 in turn having keyed thereto a bevel gear 62, meshing with bevel gear 63 in turn having its hub keyed to the shaft 64.” *Id.* at 9:19–24. “The shafts 61 and 64 are suitably journaled in bearings supported by the gear housing 65,” and “[a] pair of flexible couplings 66 are connected by the transverse shaft 67 thereby connecting the steering means of both forward drive wheel assemblies.” *Id.* at 9:24–28. “The power and hand steering sources are communicated to the . . . steering means,” “the motor 68 drives suitable sprockets and chain 69 . . . drives the shaft 70,” which “is connected

to the flexible coupling 71” that “transmits steering power to the . . . steering mechanism.” *Id.* at 9:28–34.

3. *Skotnikov (Ex. 1008)*

Skotnikov, titled “Work Vehicle Steering and Suspension System,” issued November 6, 2001. Ex. 1008, codes (54), (45). Skotnikov “relates . . . to a work vehicle steering system for off-road work vehicles.” *Id.* at 1:5–8. Figure 1 of Skotnikov is reproduced below.

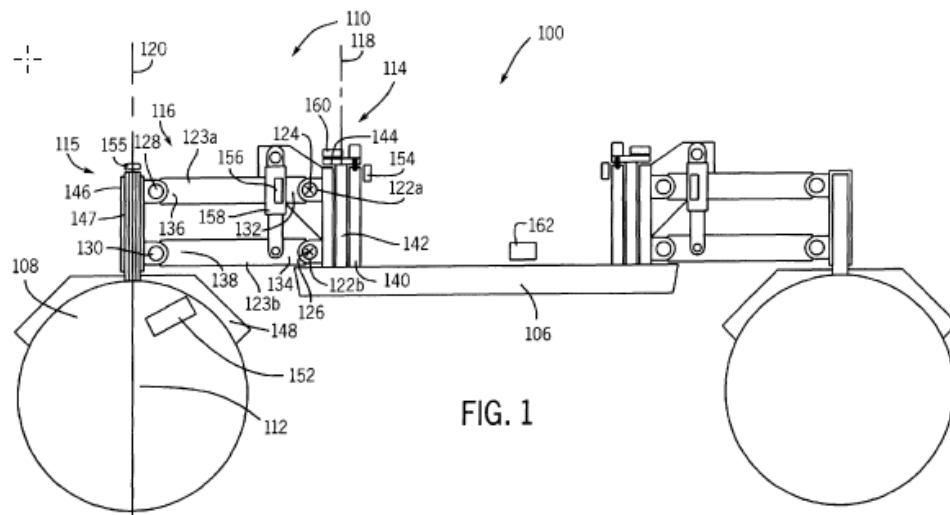


Figure 1 of Skotnikov is an aside view of a chassis of a work vehicle having a steering and suspension system. Ex. 1008, 2:22–24. As shown, “chassis 100 includes a frame 106 coupled to four wheel assemblies 108 via four similar suspension/steering coupling assemblies 110.” *Id.* at 2:57–59. Coupling assembly 110 includes rotatable assemblies 114, 115, and 116. *Id.* at 3:17–18. Rotatable assemblies 114 and 115 can include helical rotary actuators, such as a hydraulic cylinder, and can be configured to rotate an axle or shaft within sleeves 140 and 146, respectively. *Id.* at 3:35–49, 3:53–55.

Figure 6 of Skotnikov is reproduced below.

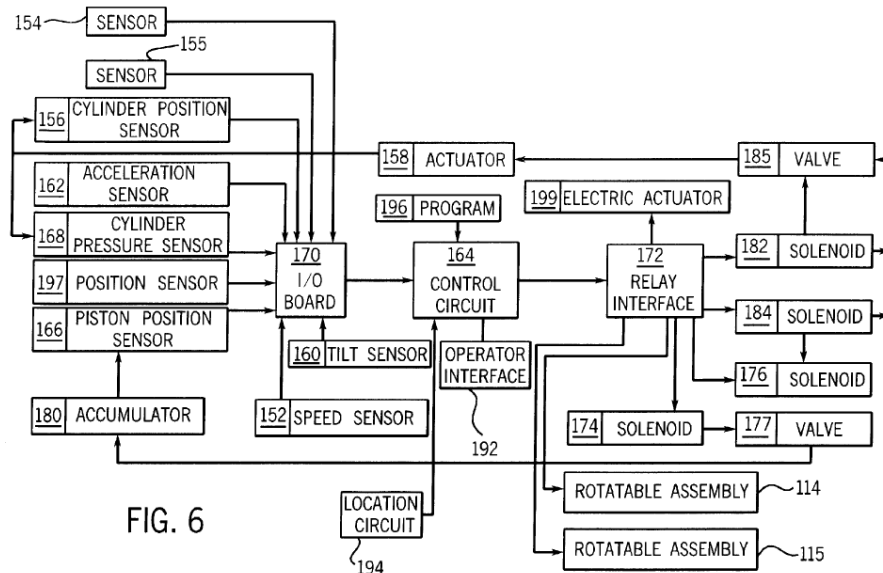
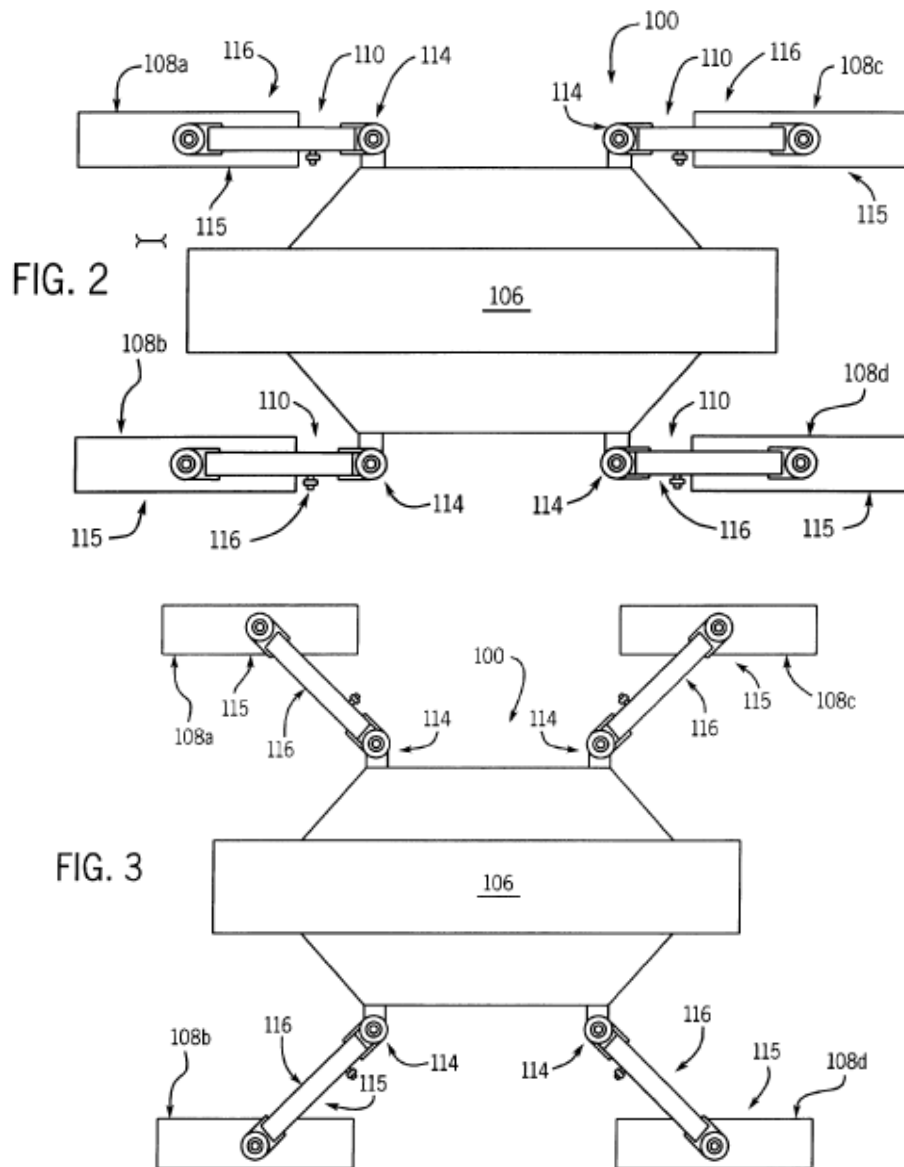


Figure 6 of Skotnikov depicts the control circuit for the steering and suspension system. Ex. 1008, 2:34–35. As shown, control circuit 164—through the use of a relay interface 172, sensors 152, 154, 155, 156, 160, 162, 166, 168, and 197 and actuator solenoids 174, 176, 182, and 184—is operative to provide control signals to rotatable assemblies 114 and 115 in order to steer wheel assemblies 108. *Id.* at 4:46–48, 4:62–67. In one embodiment, “[c]ontrol circuit 164 is configured to lower frame 106 via coupling assemblies 110 by enabling solenoid 182,” which “actuates valve 185 to remove hydraulic oil from actuator 158,” which then “retracts, providing a decreased distance between sleeve 140 and lever 123*b* to move frame 106 downward relative to wheel 108.” *Id.* at 7:52–57.

Control circuit 164 may also be configured to provide control signals to rotatable assemblies 114 and 115 to adjust the distance between wheels 108*a*, 108*b*, 108*c*, and 108*d*. Ex. 1008, 5:2–4. This wheel width adjustment can be seen in Figures 2 and 3, which are reproduced below.



Figures 2 and 3 of Skotnikov depict wheel assemblies 108 with narrow and wider widths, respectively. Ex. 1008, 5:19–21.

4. *McColl (Ex. 1010)*

McColl, titled “Independent Steering and Propulsion System for Off Road Vehicle,” issued December 9, 1980. Ex. 1010, codes (54), (45). McColl “relates to self-propelled vehicles used primarily to transport long loads across roadless terrain.” *Id.* at 1:15–17. McColl describes a vehicle

including “modular front and rear wheel assemblies,” each having “an electrical or hydraulic actuator . . . to impart individually controlled steering movements to the particular wheel.” *Id.* at 1:29–30, 1:62–64. McColl’s vehicle further includes a “steering control system” with “a turn angle sensor . . . incorporated in the steering linkage for each wheel to continuously generate a signal proportional to the turning angle of such wheel.” *Id.* at 6:29–32, 6:34–35. Notably, McColl’s control system includes “a microprocessor 204 to control respectively the turn angle of the vehicle,” where “sensor signals” “respectively proportional to the rotational velocity of the wheel and to the angle of turn of the particular wheel” “are inputs to [the] microprocessor.” *Id.* 1:64–1:68, 6:34–43. McColl also describes that its “microprocessor can be programmed to cause the vehicle to turn according to the Ackerman[n] principle.” *Id.* at 2:18–24; *see also id.* at 7:12–24, 8:53–62.

II. ANALYSIS OF PETITIONER’S CHALLENGES

A. *Applicable Law*

Petitioner’s asserted grounds of unpatentability are based on obviousness under 35 U.S.C. § 103.

Section 103(a) forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.”

KSR Int’l Co. v. Teleflex Inc., 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary

skill in the art; and (4) when available, objective evidence,⁷ such as commercial success, long felt but unsolved needs, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

The Supreme Court made clear that we apply “an expansive and flexible approach” to the question of obviousness. *KSR Int’l Co.*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417. To support this conclusion, however, it is not enough to show merely that the prior art includes separate references covering each separate limitation in a challenged claim. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness additionally requires that a person of ordinary skill at the time of the invention “would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention.” *Id.*

“[O]bviousness must be determined in light of *all the facts*, and . . . a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine” teachings from multiple references. *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (emphasis added); *cf. Elekta Ltd. v. ZAP Surgical Sys., Inc.*, 81 F.4th 1368, 1374 (Fed. Cir. 2023) (“Whether a skilled artisan would have been motivated to combine references or would have had a reasonable expectation of success in combining references are questions of fact . . .”).

⁷ Neither party directs us to any objective evidence of non-obviousness.

As a factfinder, we also must be aware “of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.”

KSR Int’l Co., 550 U.S. at 421.

B. Level of Ordinary Skill in the Art

The level of skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Petitioner contends “[a] POSITA in the field of the ’995 patent (mobile construction machines) would have had knowledge of the literature concerning machine design, including hydraulic systems and their use to steer and position wheels/tracks, before July 2004.” Pet. 15–16 (citing Ex. 1003 ¶¶ 27–28). Petitioner further contends that a person having ordinary skill in the art

would have had: (i) a bachelor’s degree (or equivalent) in mechanical engineering (or a similar field) and at least two years of experience working on mobile construction machine design (or in a similar field); or (ii) seven years of experience working on mobile construction machine design (or in a similar field).

Id. at 16 (citing Ex. 1003 ¶¶ 27–28). Patent Owner does not address the level of ordinary skill in the art in its Response. Dr. Klopp states that “[w]hile I do not opine on the correctness of [Petitioner’s] description [of the level of ordinary skill], I apply [Petitioner’s] description of a person of ordinary skill in the art for the purposes of my declaration.” Ex. 2004 ¶ 26.

Based on the prior art, the sophistication of the technology at issue, and Mr. Orr’s Declaration testimony, we adopt Petitioner’s undisputed definition of the level of ordinary skill. We determine that this definition is consistent with the prior art of record and the skill reflected in the

Specification of the '995 patent. Ex. 1003 ¶¶ 27–28; Ex. 1001 (describing a mobile construction machine); Exs. 1005–1015 (disclosing aspects of mobile construction machine design).

C. Claim Construction

In *inter partes* reviews, we interpret a claim “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b). Under this standard, we construe the claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.*

1. Means-plus-function terms

Independent claim 45 uses “means-plus-function” language, reciting several such clauses. Ex. 1001, 14:31–50; *see* 35 U.S.C. § 112 ¶ 6 (we cite to the pre-AIA version of the statute applicable to the challenged claims). Means-plus-function claiming occurs when a claim term is drafted in a manner that invokes 35 U.S.C. § 112 ¶ 6, which states:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

See 35 U.S.C. § 112 ¶ 6; *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1347 (Fed. Cir. 2015) (en banc). “Determining the claimed function and the corresponding structure for a claim limitation written in means-plus-function format are both matters of claim construction.” *WMS Gaming, Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1347 (Fed. Cir. 1999)

On the complete record, we have not been directed to any dispute between the parties whether § 112 ¶ 6 applies to the recited means-plus-function clauses in the Challenged Claims. Pet. 17; PO Resp. 9.

Where claim language may be construed according to 35 U.S.C. § 112(f) (or its predecessor, § 112 ¶ 6), a petitioner must provide a construction that includes both the claimed function and the specific portions of the specification that describe the structure, material, or acts corresponding to each claimed function. 37 C.F.R. § 42.104(b)(3).

a) Petitioner's construction in the Petition

Petitioner asserts that claim 45's recitation of "support means," "first actuatable means," and "second actuatable means" "creat[es] a presumption that these elements should be interpreted under 35 U.S.C. § 112[] ¶ 6." Pet. 17. Petitioner states that "[a]s discussed in co-pending Petition IPR2022-01394, claim 45 should be interpreted under 35 U.S.C. § 112[] ¶ 6," but that construction of these terms "is not necessary to resolve the controversy because the applied art discloses all limitations of claim 45, including the corresponding structure disclosed in the '995 patent specification for performing the recited functions." *Id.* According to Petitioner, "[a]ll other claim terms should receive their plain and ordinary meaning, in the context of the '995 patent specification." *Id.* at 16. In other words, Petitioner has not proposed a specific construction for any of the recited means-plus-function elements,⁸ including identifying the recited

⁸ Claim 45 additionally recites a "controller means"; claim 49 recites a "rotation sensor means"; claim 51 recites a "pivot sensor means"; and claim 61 recites an "anti-swing means." See Ex. 1001, 14:48–50, 14:61–65, 15:4–10, 16:19–23.

function and the corresponding structure *in the Specification* of the '995 patent.

b) Patent Owner's response

Patent Owner argues that “the [P]etition does not identify corresponding structure for any [means-plus-function] term, as required by the Federal Circuit and the Board’s rules, let alone explain how the art discloses such structure or its equivalent.” PO Resp. 9 (citing Pet. 17; *Fresenius USA, Inc. v. Baxter Int’l, Inc.*, 582 F.3d 1288, 1299 (Fed. Cir. 2009)). Patent Owner argues that “[a]s a matter of basic logic, the [P]etition cannot show the applied art discloses the corresponding structure when the petition never identifies that structure in the first place.” *Id.* at 10. Patent Owner adds that “Petitioner’s assertion is also contrary to the requirements for proving obviousness as set forth in Federal Circuit precedent and the Board’s rules.” *Id.*

Patent Owner also argues that Petitioner improperly incorporates by reference its claim construction position from the IPR2022-01394 petition. PO Resp. 10–11.

c) Petitioner's Reply and Patent Owner's Sur-reply

Petitioner replies that the Petition identifies corresponding structure for the means-plus-function claim element when addressing the patentability of dependent claims 47, 48, 53, 57, 58, and 60. Pet. Reply 26–27 (citing Pet. 68, 69, 78, 79, and 85–88 and referencing Ex. 1040 ¶¶ 62–63).

Petitioner argues that prior Board decisions have held that this approach satisfies our rules. *Id.* at 27–28 (citing *American National Manufacturing Inc. v. Sleep Number Corp.*, IPR2019-00500, Paper 114 at 22–24 (PTAB Sept. 30, 2020), *Microchip Technology Inc. v. HD Silicon Solutions LLC*,

IPR2021-01089, Paper 8 at 6–8 (PTAB Jan. 10, 2022), *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1371 (Fed. Cir. 2019); *Callaway Golf Co. v. Acushnet Co.*, 576 F.3d 1331, 1344 (Fed. Cir. 2009)); *see id.* (explaining *American National Manufacturing* and comparing it to the facts here); *see also id.* at 28–32 (arguing how the analysis of the dependent claims satisfies Petitioner’s requirements).

Petitioner also argues that our Rule 42.104(b)(3) requires construction of terms in controversy only. Pet. Reply 32–33 (citing *Costco v. Robert Bosch LLC*, IPR2016-00041, Paper 20 at 8 (PTAB Apr. 25, 2016); *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017)). Petitioner argues that “Caterpillar *neither* raises a claim construction issue as to the structure in claims 47, 48, 53, 57, 58, and 60 *nor* contests that the applied references disclose the subject matter recited in claims 47, 48, 53, 57, 58, and 60. Thus, the subject matter of the [means-plus-function] elements is *not* disputed.” *Id.* at 33. Petitioner also argues that Patent Owner “has had ample notice of the identified structure corresponding to claimed MPF elements. The record clearly sets forth that the Bitelli-Feliz-Skotnikov combination renders obvious the MPF elements in the context of claims 47, 48, 53, 57, 58, and 60.” *Id.*

Patent Owner replies that the Petition’s analysis of dependent claims 47, 48, 53, 57, 58, and 60 does not identify any disclosure in the Specification of the ’995 patent. PO Sur-reply 20. Patent Owner also distinguishes Petitioner’s cited cases. *See id.* at 21–23. Patent Owner adds that Petitioner’s identification of structure in the Reply still falls short of a proper means-plus function analysis, as it “does not identify the relevant

function or explain why the structure in the specification corresponds to . . . the recited function.” *Id.* at 24.

Patent Owner argues that *Costco* states that a petitioner must identify corresponding structure for means-plus-function terms, and Petitioner did not do that here. PO Sur-reply 25. Patent Owner also argues that Petitioner misreads *Nidec*, “which has nothing to do with an [*inter partes* review] petitioner’s obligation to construe certain terms.” *Id.*

Patent Owner also argues that it does dispute Petition’s analyses of dependent claims 47, 48, 53, 57, 58, and 60—it disputes that independent claim 45 is proven unpatentable because of Petitioner’s approach to claim construction and that these dependent claims identify the corresponding structure. PO Resp. 26–27.

d) Analysis and conclusion

We agree with Patent Owner that Petitioner’s treatment of the means-plus-function limitations in certain Challenged Claims is deficient, both in respect to our rules and what is needed to prove unpatentability. As we stated in our Institution Decision, “Petitioner cannot demonstrate that the prior art discloses the structure corresponding to each means-plus-function limitation, and, consequently, cannot demonstrate that independent claim 45 is unpatentable over the prior art.” Inst. Dec. 44. For the reasons below, we do not modify that conclusion.

Our Rules require that, “[w]here the claim to be construed contains a means-plus-function [limitation] . . . , the construction of the claim must identify the specific portions of the specification that describe the structure, material, or acts corresponding to each claimed function.” 37 C.F.R.

§ 42.104(b)(3); *cf. Fresenius USA, Inc. v. Baxter Int’l, Inc.*, 582 F.3d 1288,

1299 (Fed. Cir. 2009) (“[A] challenger who seeks to demonstrate that a means-plus-function limitation was present in the prior art must prove that the corresponding structure—or an equivalent—was present in the prior art.”).

As an initial matter, Petitioner’s reliance on *Costco* and *Nidec* are misplaced. In the non-precedential institution decision in *Costco*, the Board expressly warned that, “[a]s a practical matter, however, we note that a petitioner who fails to offer a claim construction of a potential means-plus-function limitation of a challenged claim may very likely run the risk of . . . failing to address adequately the patentability of the claimed subject matter.” *Costco*, Paper 20 at 8 n.8. And, as Patent Owner argues, it does dispute Petitioner’s application of the prior art to the means-plus-function limitations of independent claim 45, based on Petitioner’s lack of claim construction. As such, *Nidec* is inapposite.

Also, we agree with Patent Owner that, to the extent that the Petition attempts to incorporate by reference its claim construction analysis from the petition in IPR2022-01394, such an attempt is improper. *See* 37 C.F.R. § 42.6(a)(3) (“Arguments must not be incorporated by reference from one document into another document.”); Pet. 17 (“As discussed in co-pending Petition IPR2022-01394, claim 45 should be interpreted under 35 U.S.C. § 112, ¶6.”).

Petitioner’s reliance on its analysis of dependent claims 47, 48, 53, 57, 58, and 60 is not persuasive. Nowhere in the analysis of any of these claims does Petitioner identify corresponding structure in the Specification of the ’995 patent to the functions recited in the means-plus function claim terms of claim 45 or other claims (or even identifies the function). Also, nowhere

in the analyses of the claim limitations that Petitioner acknowledges are means-plus-function limitations does Petitioner direct us to the analysis of dependent claims 47, 48, 53, 57, 58, and 60 as identifying corresponding structure.

The Board decisions and Federal Circuit case law upon which Petitioner relies are distinguishable. As for *American National Manufacturing*, a non-precedential case from the Board, the petitioner is that case *specifically referenced* its analysis in dependent claim 3 for the means-plus-function limitation at issue, which the Board credited. *See American National Manufacturing Inc.*, IPR2019-00500, Paper 114 at 23⁹; *cf. Am. Nat’l Mfg. Inc. v. Sleep No. Corp.*, 52 F.4th 1371, 1385 (Fed. Cir. 2022) (“[T]he Board found that American National had done enough to meet the requirements of [Rule 42.104]. We give deference to the Board’s application of its own rules.”). No such cross-reference is made in our proceeding here.

In *Microchip Technology Inc.*, the Petitioner did not provide specific means-plus-function claim construction analyses, even though the petition identified certain terms as containing means-plus-function terms. *Microchip Technology Inc.*, IPR2021-01089, Paper 8 at 6–7. The panel, applying the more flexible institution standard, noted that the petition at issue, “in its comparison of [the prior art] to element [1.b], [p]etitioner identifies structures from the ’299 patent’s specification that correspond to

⁹ Even with the specific reference in *American National Manufacturing*, which is not present here, the panel in that case stated that “the Petition and the relevant reference to claim 3 of the ’154 patent at page 54 is not as express as one would hope with respect to complying with our rule.” *American National Manufacturing Inc.*, IPR2019-00500, Paper 114 at 23.

the claimed ‘connecting means,’ including switches which [p]etitioner contends are controlled gate structures.” Id. at 7 (emphasis added).

Petitioner does not make such a comparison of structure from the Specification of the ’995 patent here.

In *Realtime Data*, the case did not involve a means-plus-function claim limitation. *Realtime Data LLC*, 912 F.3d at 1371. As such, it is inapposite. Similarly, *Callaway Golf Co.* is inapposite. That case deals with an inconsistent jury verdict, where a dependent claim was found invalid, but not a broader independent claim. *Callaway Golf Co.*, 576 F.3d at 1344. We make no such inconsistent conclusions here.

Accordingly, for the reasons discussed above, we determine that Petitioner has failed to construe the means-plus-function claim limitations of the Challenged Claims, and specifically, failed to identify corresponding structure from the ’995 patent for these terms so that we may evaluate the merits of Petitioner’s unpatentability assertions with respect to claim limitations including those terms. *Cf. Fresenius USA, Inc.*, 582 F.3d at 1299 (“[A] challenger who seeks to demonstrate that a means-plus-function limitation was present in the prior art *must prove that the corresponding structure—or an equivalent—was present in the prior art.*” (emphasis added)).

2. Other claim terms

We determine that we need not expressly construe any other claim terms to resolve the parties’ disputes. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am.*

Sci. & Eng'g, Inc., 200 F.3d 795, 803 (Fed. Cir. 1999)). To the extent that the scope of any particular claim term requires discussion, however, we provide it in our assessment of the challenges, which we turn to next.

D. Ground 1: Claims 18–20, 29–31, and 33 as unpatentable over Bitelli and Feliz

Petitioner contends that the combined teachings of Bitelli and Feliz render obvious the subject matter of claims 18–20, 29–31, and 33.

Pet. 20–47. Patent Owner disputes Petitioner's contentions that the proposed combination teaches or suggests the "support device" and "first actuator" elements of claim 18, as well as the proposed motivation to combine Bitelli and Feliz, and Petitioner's contentions with respect to dependent claim 30. Prelim. Resp. 12–37. We address Petitioner's contentions and Patent Owner's arguments below, beginning with the motivation to combine Bitelli and Feliz.

1. Motivation to Combine Bitelli and Feliz

a) Petitioner's contentions

Petitioner contends that a person having ordinary skill in the art "would have been motivated to connect a steering actuator to Bitelli's lifting column (hydraulic jack 14), as taught by Feliz, to rotate the inner tube of Bitelli's lifting column so Bitelli's rear wheel 5 has steering capability, thereby preventing the rear wheels from scraping the ground during turning." Pet. 37 (referencing Ex. 1003 ¶¶ 150–153). In addition to Mr. Orr's testimony, Petitioner supports its contention with a statement in

published European Patent Application EP 1 039 037, by Bitelli S.p.A. (Ex. 1014, “Bitelli ’037”). *Id.*¹⁰

Mr. Orr testifies that Bitelli ’037 explains that “[o]ne limitation shown by the machine described in the aforementioned patent is that when the rear wheels or tracks are set in their retracted position inside the frame, when turning they scrape the ground with considerable resistance.” Ex. 1003 ¶ 152 (quoting Ex. 1014 ¶ 12). Mr. Orr testifies that a person having ordinary skill in the art “would have known that Bitelli’s right rear wheel resisted the turning motion of the vehicle when set in the retracted position.” *Id.* ¶ 153.

b) Patent Owner’s responsive arguments

Patent Owner argues that a person having ordinary skill in the art would not have viewed Bitelli as having a wheel scraping issue. PO Resp. 19–20. Patent Owner argues that “Bitelli ’037 refers to wheel-scraping exhibited by a machine in ‘the aforementioned patent,’ which the [P]etition did not identify or submit.” *Id.* at 20.

Patent Owner next argues that Petitioner does not explain why a person having ordinary skill in the art would have located the rotary actuator at the top of Bitelli’s hydraulic jack. PO Resp. 22. Patent Owner states that Petitioner ignores that Feliz’s reason for locating the actuator at the top of its lifting column does not apply to Petitioner’s modification. *Id.* at 22–23.

¹⁰ The Petition erroneously references Exhibit 1013 paragraph 12, instead of Exhibit 1014 paragraph 12. *See* Ex. 1014 ¶ 12 (discussing wheel scraping); Ex. 1003 ¶ 150 (discussing motivation to combine Bitelli and Feliz and referencing Exhibit 1014 paragraph 12). Patent Owner argues in its Response that Exhibit 1013 (McCutcheon) does not relate to wheel scraping, but then addresses Exhibit 1014 (Bitelli’037). PO Resp. 19.

Patent Owner argues that Feliz locates its steering motor at the top of the column because the column is fixed within the machine's frame, and Bitelli's column is not fixed, but instead swings out from the machine. *Id.*

Patent Owner also argues that Mr. Orr's testimony is conclusory, and "does not explain *why* a [person having ordinary skill in the art] supposedly would have placed Feliz's steering mechanism [at the upper portion of Bitelli's lifting column] when Bitelli's pivoting hydraulic jack has a significantly different location and movement compared to Feliz's horizontally fixed piston skirt." PO Resp. 24.

Patent Owner next argues that Petitioner's proposed modification deviates from Feliz's teachings. PO Resp. 25. Patent Owner argues that Petitioner, driven by hindsight, modifies Feliz's technique to fit within the requirements of the claims. *Id.* at 25–29. Patent Owner argues that proposed deviations from Feliz's teachings are not the product of ordinary creativity of a person having ordinary skill in the art. *Id.* at 29–30. Patent Owner adds that "Petitioner relies entirely on baseless, *post-hoc* rationalization to 'eliminate Feliz's additional transmission components.'" *Id.* at 30.

Again, Patent Owner argues that Mr. Orr's testimony in support of Petitioner's modification is "uncorroborated." *See* PO Resp. 30–31.

Next, Patent Owner argues that Petitioner's "proposed combination ignores the different arrangements and purposes of the references' purported lifting column and associated components." PO Resp. 31. Patent Owner argues that "Petitioner premises its" reasons for modifying Bitelli to add the second actuator "on the assumption that Bitelli's hydraulic jack has an inner tube connected to the wheel such that turning this inner tube turns the

wheel.” *Id.* (citing Pet. 28–36). Patent Owner argues that “this assumption is incorrect and overlooks Bitelli’s teachings regarding both the structure and purpose of the relevant components.” *Id.*; *see also id.* at 32–35 (explaining Bitelli’s structure in relation to Petitioner’s proposed modification, and specifically, that “Bitelli’s hydraulic jack does not have an inner tube connected to the wheel”).

c) Petitioner’s and Patent Owner’s reply arguments

Petitioner replies that it relies on Bitelli ’037 and testimony from Mr. Orr to support Petitioner’s position that Bitelli suffers from the problem of wheel scraping when its rear wheel is in a retracted position. Pet. Reply 7. Petitioner argues that Exhibit 1014 is state-of-the-art evidence that supports its motivation for modifying Bitelli with Feliz’s teaching. *Id.* at 8.

Petitioner also argues “the record [is] clear that Bitelli ’037 references the milling machine in Bitelli.” Pet. Reply 8. Petitioner explains that the “aforementioned patent” discussed in Ex. 1014 the parent Italian application to Bitelli and is discussing the machine in Bitelli. *Id.* at 9; *see also*, Ex. 1042 (providing the Italian application, which was entered into the record in support of Petitioner’s Reply).

Next, Petitioner responds that Feliz teaches a known way to steer a rear wheel without impeding the function of a lifting column. Pet. Reply 10 (referencing Ex. 1003, 150–153; Ex. 1040 ¶¶ 29–30; Ex. 1012, 8:45–9:46). Petitioner argues that locating the actuator at the top of Bitelli’s lifting column is suggested by Feliz. *Id.* at 11 (referencing Ex. 1012, Fig. 4, 8:45–9:46; Ex. 1003 ¶ 143). Petitioner adds that a person having ordinary skill in the art “would have recognized that the upper portion of Bitelli’s

lifting column was the natural location to mount a rotary actuator to avoid interference with movement of Bitelli's articulation unit located below the upper portion of the lifting column." *Id.* at 12 (referencing Ex. 1040 ¶ 32).

Next, Petitioner replies that a person having ordinary skill in the art "would have understood that Feliz's transmission components are not needed for implementing a rotary actuator in the Bitelli-Feliz combination." Pet. Reply 13 (citing Pet., 33; Ex. 1003 ¶¶ 141–142). Petitioner directs us to "other state-of-the-art references" that show a rotary actuator on top of a lifting column. *Id.* at 14–15 (providing annotated images from Ex. 1009).

Next, Petitioner replies that Patent Owner is wrong about the operation of Bitelli's lifting column, and that "plate 13" in Figures 1 and 2 of Bitelli is different than "plate" 13 in Figure 3 to 4 of Bitelli. Pet. Reply 18. Petitioner argues that the use of two different item "13s" is an apparent typographical error. *Id.*; *see id.* at 18–22 (explain why there are two "plate 13s").

Patent Owner replies that Bitelli's four-bar linkage keeps its wheel from rotating relative to plate 13. PO Sur-reply 5. Patent Owner argues that "regardless of the precise component-to-component attachments, Bitelli's wheel is *rotationally fixed* relative to the plate shown in Figures 3–5." *Id.* at 6. Patent Owner argues that "Petitioner does not dispute that the rotational linkage between the plate of Figures 3-5 and the wheel is central to the purpose and principle of operation of the four-bar linkage," as Patent Owner argued in its Response. *Id.* (citing PO Resp. 34–35). Patent Owner adds that the inner and outer tubes in Bitelli are keyed together, so that the inner tube cannot rotate independent of the outer tube. *Id.*; *see also id.* at 7

(showing an annotated version of Bitelli's Figure 3, allegedly showing where the tubes are keyed together).

Patent Owner next replies that Petitioner's only support for the assertion that the upper portion of the lifting column is the "natural location" for the rotary actuator is Mr. Orr's conclusory testimony. PO Sur-reply 8.

Patent Owner characterizes Petitioner's reliance on Exhibit 1009 as a "new argument[]" and further responds that Petitioner fails to explain how Exhibit 1009 motivates positioning the second actuator spaced apart from the first actuator. PO Sur-reply 10. Patent Owner also characterizes Petitioner's arguments concerning the Italian patent application that matured into Bitelli as "new arguments." *Id.* at 11–12.

d) Analysis and findings – motivation to combine

We have reviewed the parties' arguments and accompanying evidence and find, on the complete trial record, that Petitioner demonstrates, by a preponderance of the evidence, that a person of ordinary skill in the art would have had reason to modify the Bitelli to allow for rear wheel steering.

First, we find that the complete record support's Petitioner's basis that Bitelli would have a rear wheel scraping problem. *See* Pet. 37. Bitelli '037 expressly states that "[o]ne limitation shown by the machine described in the aforementioned patent is that when the rear wheels or tracks are set in their retracted position inside the frame, when turning they scrape the ground with considerable resistance." Ex. 1014 ¶ 12. The exhibit makes clear that the "aforementioned patent" is a patent application with the number VI98U000098. *Id.* ¶ 11. The trial record also makes clear that Bitelli, a published European patent application, claims priority to that patent application. *See* Ex. 1011, code (30) (claiming priority to Italian application

VI980098 U). As such, the machine in Bitelli is the machine with the wheel scraping problem identified in Bitelli '037. *See also* Pet. Reply 9 (showing images from Ex. 1011 and Ex. 1042¹¹ (the Italian application referenced in Ex. 1014 depicting the same machine). Accordingly, we do not find an evidentiary gap in Petitioner's contentions. *Cf.* PO Resp. 19–20; PO Sur-reply 11–12.

Second, we find that a person having ordinary skill in the art would have had reason to modify Bitelli to enable rear wheel steering to overcome the problem of wheel scraping. *See* Pet. 38. We also find that Feliz teaches a rotary actuator that steers the wheels of a large work machine. *See* Ex. 1012, 2:30–34, 9:2–46, Fig. 2; *see also* Pet. 8, 9 (providing annotated versions of Feliz's Figure 4, depicting the configuration of rotary actuator with respect to the lifting column), 33 (providing an annotated partial version of Feliz's Figure 3, showing steering motor arrangement).

Third, we find that a person having ordinary skill in the art would have had a reasonable expectation of success in modifying Bitelli with Feliz's teachings. *See* Pet. 38–39. We agree with Petitioner that state-of-the-art evidence demonstrates that a rotary actuator can be used on a lifting column to steer a wheel. *See id.* at 39 (referencing Ex. 1009, 3:16–5:35); *see also id.* at 10 (providing annotated version of Exhibit 1009, Figures 3, 10).

¹¹ Patent Owner at least suggests that Petitioner's reliance on Exhibit 1042 and Bitelli's priority claim to the application in that exhibit in Petitioner's Reply constitutes a new argument. *See* PO Sur-reply 11–12. We do not agree. We find that Petitioner's reply argument is responsive to Patent Owner's argument, and “simply expands on previously raised arguments” by clarifying evidence already in the record. *See Rembrandt Diagnostics, LP v. Alere, Inc.*, 76 F.4th 1376, 1384 (Fed. Cir. 2023).

We also agree that “Feliz’s rotary actuator is designed to steer a wheel about a lifting column, such as Bitelli’s lifting column.” *Id.* at 38–39; *see also* Ex. 1003 ¶¶ 154–156 (providing testimony consistent with the evidence of record that using a rotary actuator to steer a wheel associated with a lifting column was known).

We have considered Patent Owner’s counterargument and find, on the complete record, that Petitioner’s arguments and evidence outweigh Patent Owner’s arguments and evidence. We do not agree with Patent Owner that the Petition does not support adequately why a person having ordinary skill in the art would have located the actuator at the upper portion of a lifting column. As Petitioner contends, Feliz itself teaches or suggests that location. *See* Pet. 39. Indeed, even if Feliz positions its actuator as it does because of the overall structure of Feliz, having the actuator connect to the upper portion of Feliz’s lifting column would at least suggest to a person having ordinary skill in the art to use that location.

Also, state-of-the-art evidence shows a rotary actuator located at the upper portion of a lifting column. *See, e.g.,* Pet. 10 (providing annotated version of Exhibit 1009, Figures 3, 10); Pet. Reply 14 (replying that “state-of-the-art references, such as Titford,¹² teach connecting the rotary actuator directly to a swinging lifting column,” and reproducing annotated version of Exhibit 1009, Figures 3, 10); *cf. Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1365 (Fed. Cir. 2015) (“Art can legitimately serve to document the knowledge that skilled artisans would bring to bear in reading the prior art identified as producing obviousness.”).

¹² US 6,435,766 B1, issued Aug. 20, 2002 (Ex. 1009).

We also find that a person having ordinary skill in the art would have implemented Petitioner’s proposed modification to Feliz’s steering mechanism, to remove certain transmission linkage between the motor and connection to the lifting column, given the differences in Feliz’s and Bitelli’s machines. *See* Pet. 33 (“A [person having ordinary skill in the art] would have recognized that Feliz’s motor 68 can be directly connected to steering shaft 59 and effectively provide rotary motion to the worm gear arrangement disposed in upper pedestal housing 29 of Feliz’s lifting column.”); *see also id.* at 32–34 (explaining how the linkage works in Feliz and why the same linkage is not needed in Bitelli); *cf. KSR Int’l Co.*, 550 U.S. at 421 (“A person of ordinary skill is also a person of ordinary creativity, not an automaton.”).

We do not agree with Patent Owner that one of Bitelli’s stated goals is “to *minimize* the number of drive components powering the manipulation of its rear wheels.” PO Resp. 27–28 (referencing Ex. 2004 ¶ 50, which cites Ex. 1011 ¶¶ 13, 27–29). For example, Bitelli’s paragraph 13 merely states that an aim of Bitelli is to automate the unlocking, moving, and locking of the lifting column/wheel structure, using a single drive motor to move the structure. *See* Ex. 1011 ¶ 13. Paragraphs 27 through 29 provide the process, where actuator means 16 is used to move the lifting column/wheel structure between a retracted and extended position, and actuator means 19 is used to unlock and lock the structure in the desired position. *See id.* ¶¶ 27–29. Patent Owner and Dr. Kopp overstate Bitelli’s disclosure. *See* PO Resp. 27–28; Ex. 2004 ¶ 50.

We also do not agree with Patent Owner’s argument that Feliz’s teachings are limited to using only one steering motor to steer each rear

wheel. *See* PO Resp. 28–29. Feliz’s use of a single steering motor is based on the nature of its machine, with the nature of Bitelli’s machine necessitating an actuator on each rear wheel assemble. *Compare* Ex. 1012, Fig. 1 (depicting Feliz’s machine) *with* Ex. 1011, Fig. 1 (depicting Bitelli’s machine); *see also* Pet. 3 (providing annotated versions of comparing the two machines).

We also find that Petitioner correctly reads Bitelli as identifying two “plate 13s.” We find Bitelli clearly shows one plate located just above wheel 4 in Figures 1 and 2. *See* Ex. 1011, Figs. 1, 2; *see also* Pet. 28 (providing an annotated version of Bitelli’s Figure 2, depicting plate 13). Bitelli also shows a linear actuator connected to the lifting column (hydraulic jack 14) above the location of plate 13. *See, e.g.*, Pet. 28 (providing an annotated version of Bitelli’s Figure 2, showing the actuator in red connected to jack 14 well above plate 13).

Bitelli’s Figure 3–5 show arms 11 and 12, which are at the point where the linear actuator (actuator means 16) connects to hydraulic jack 14. *See* Ex. 1011, Figs. 3, 4 (showing arms 11 and 12 attached to plate 13). Given that this “plate 13” is located where actuator means 16 connects with hydraulic jack 14, this plate must be misnumbered, that is, is different from plate 13 in Figures 1 and 2. *Cf.* Pet. Reply 18–22 (describing the two plate 13s of Bitelli).

We also find that Bitelli discloses that hydraulic jack 14 includes inner and outer tubes. As seen in Bitelli’s Figures 1 and 2, the bottom of jack 14 is attached to wheel 5. Ex. 1011, Figs. 1, 2. Bitelli describes that “hydraulic jack 14 connects the plate 13 to the frame 2 and allows the lifting and the lowering of the machine according to the directions of the arrow 15

in order to adjust the milling depth of the drum 6.” *Id.* ¶ 23. This disclosure indicates that Bitelli includes inner and outer tubes that allow the hydraulic jack to work. *See* Pet. 24 (referencing Ex. 1011 ¶ 23; Ex. 1003 ¶¶ 125–131); Pet. Reply 22 (“Accordingly, plate 13, wheel 5, and the inner tube of jack 14 shown in [Bitelli’s Figures] 1–2 rotate about the lifting column’s vertical axis.”).

We find that Patent Owner has not sufficiently demonstrated that Bitelli’s hydraulic jack 14’s inner and outer tubes are keyed together. *See* PO Sur-reply 6–7; *see id.* at 7 (providing an annotated version of Bitelli’s Figure 3 indicating an alleged slotted engagement that keys the two tubes together). Patent Owner provides only attorney argument in support of this position; Patent Owner does not direct us to any disclosure in Bitelli or other evidence to indicate that the inner and outer tubes of hydraulic jack 14 are keyed together.

To summarize, we find, on the complete trial record, that Petitioner demonstrates, by a preponderance of the evidence, that a person of ordinary skill in the art would have had reason to modify the Bitelli to allow for rear wheel steering.

2. *Independent claim 18*

We now turn our analysis to the scope and content of the prior art and any differences between the prior art and the subject matter of independent claim 18. We focus on the two disputed limitations (the support drive limitation and the first actuator limitation), but provide a complete analysis of the limitations of claim 18 to provide context for our analysis. The above analysis of motivation to combine also provides context for our analysis of claim 18 below.

a) Preamble

The preamble of claim 18 recites “[a] self-propelled machine.” Ex. 1001, 11:34. Petitioner contends that each of Bitelli and Feliz discloses a self-propelled machine. Pet. 20–21 (referencing Ex. 1011 ¶ 18; Ex. 1012, 1:16–21, 7:62–8:2; Ex. 1003 ¶¶ 119–121); *see, e.g., id.* at 21 (providing annotated versions of Bitelli’s Figure 1 and Feliz’s Figure 1, showing the respective machines).

Upon review of the information in the Petition and corresponding evidence, we find that Petitioner has proven, by a preponderance of the evidence, on the complete trial record, that the combination of Bitelli and Feliz teaches or suggests the subject matter of the preamble.

Patent Owner does not dispute Petitioner’s contentions with respect to the preamble.

b) The machine frame limitation

Claim 18 recites “a machine frame supportable by a plurality of ground engaging units.” Ex. 1001, 11:35–36 (the “machine frame” limitation of claim 18). Petitioner contends that each of Bitelli and Feliz discloses a machine with a machine frame supportable by ground engaging units. Pet. 22–23 (referencing Ex. 1011 ¶ 18; Ex. 1012, 7:62–8:2, 8:5–11; Ex. 1003 ¶¶ 122–124); *see also id.* at 22 (providing an annotated version of Bitelli’s Figure 1, indicating the frame and a ground engaging unit), 23 (providing an annotated version of Feliz’s Figure 1, indicating the frame, lifting columns, and wheels).

Upon review of the information in the Petition and corresponding evidence, we find that Petitioner has proven, by a preponderance of the

evidence, on the complete trial record, that the combination of Bitelli and Feliz teaches or suggests the subject matter of the machine frame limitation.

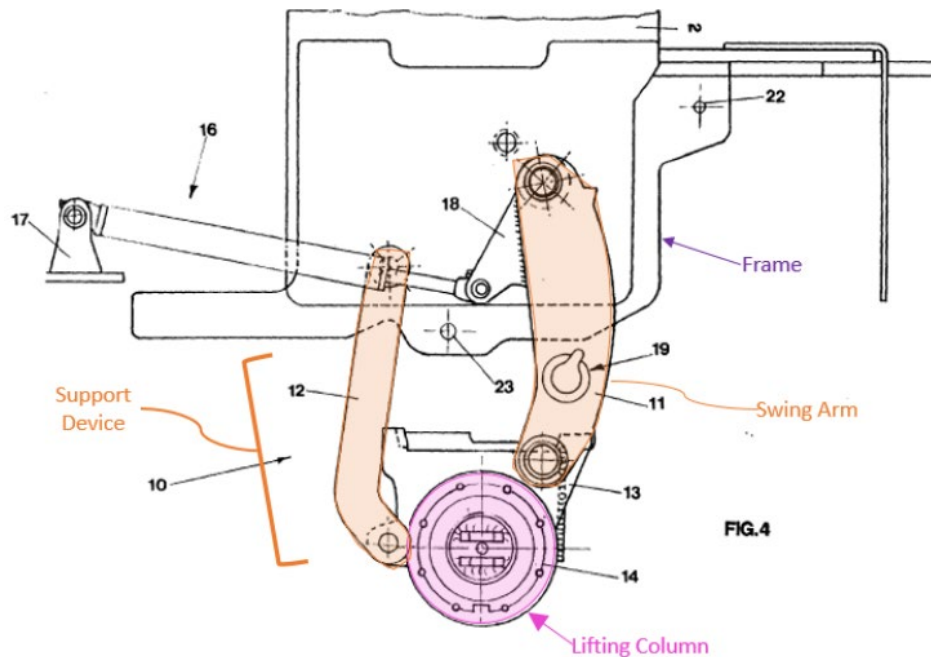
Patent Owner does not dispute Petitioner's contentions with respect to this limitation.

c) The support device limitation

Claim 18 also recites

a support device connected between said machine frame and at least one of said ground engaging units, said support device including a lifting column having a lifting column axis and being adapted to controllably raise and lower said at least one ground engaging unit about said axis relative to said machine frame.

Ex. 1001, 11:37–42 (the “support device” limitation of claim 18). Petitioner contends that Bitelli discloses that each back wheel 5 is supported by an articulation unit that includes first arm 11 and second arm 12. Pet. 23 (referencing Ex. 1011 ¶¶ 21–22; Ex. 1003 ¶¶ 125–131). Petitioner concludes that “[t]hus, Bitelli’s articulation unit 10 pivotably connects wheel 5 to frame 2.” *Id.* We reproduce Petitioner’s annotated version of Bitelli’s Figure 4, below.



EX1011, FIG. 4 (annotated).

Pet. 24. Bitelli's Figure 4 depicts details of Bitelli's articulation unit 10.

Ex. 1011 ¶ 37. Petitioner adds annotations identifying the lifting column, frame, and arms 11 and 12. Pet. 24. Petitioner contends that Bitelli's hydraulic jack 14 corresponds to the recited lifting column, which "controllably raises and lowers wheel 5 relative to frame 2." *Id.* (referencing Ex. 1003 ¶¶ 125–131); *see also id.* at 25 (providing an annotated version of Bitelli's Figure 1, identifying a ground engaging unit, lifting column, and how the structure pivots between projected and retracted positions).

Patent Owner responds that "[t]he petition never explains how the art teaches a support device that 'includ[es] a lifting column.'" PO Resp. 13. Patent Owner argues that "identifying a purported lifting column is not an assertion that the applied references teach a support device that *includes* a lifting column." *Id.* at 14. Patent Owner argues that the Petition identifies

arms 11 and 12 separate from the lifting column, hydraulic jack 14. *Id.* at 14–15.

Petitioner replies that the Petition “clearly show[s] these features using an annotated figure.” Pet. Reply 2 (citing Pet. 23–24); *see id.* at 3 (reproducing the figure and explaining its significance). Patent Owner replies that “Petitioner does not explain how multiple components interposed between plate 13 and the frame relates to a support device ‘including’ a lifting column.” PO Sur-reply 2.

We have considered Petitioner’s arguments and evidence, and Patent Owner’s counterarguments and find, on the complete trial record, that Petitioner demonstrates, by a preponderance of the evidence, that Bitelli teaches or suggests the subject matter of the support device limitation of claim 18. To reiterate, this limitation requires the support device (1) be connected between the machine frame and a ground engaging unit, and (2) include a lifting column having a lifting column axis and being adapted to controllably raise and lower said at least one ground engaging unit about said axis relative to said machine frame. Ex. 1001, 11:37–42.

The Petition identifies the back wheel 5 as a ground engaging unit. Pet. 23. The Petition also identifies mechanical arms 11 and 12 as part of articulation unit 10, which connects wheel 5 and the frame. *Id.* An annotated version of Bitelli’s Figure 4 (which appears at Pet. 24 and we reproduce above) includes an annotation of “Support Device”—a bracket that encompasses swing arms 11 and 12 and hydraulic jack 14, the identified lifting column. *See* Pet. 24. The annotated figure shows the vertical axis of hydraulic jack 14 and the location of the frame. *See id.* The Petition then directs us to a statement in Bitelli that indicates that “Bitelli’s hydraulic

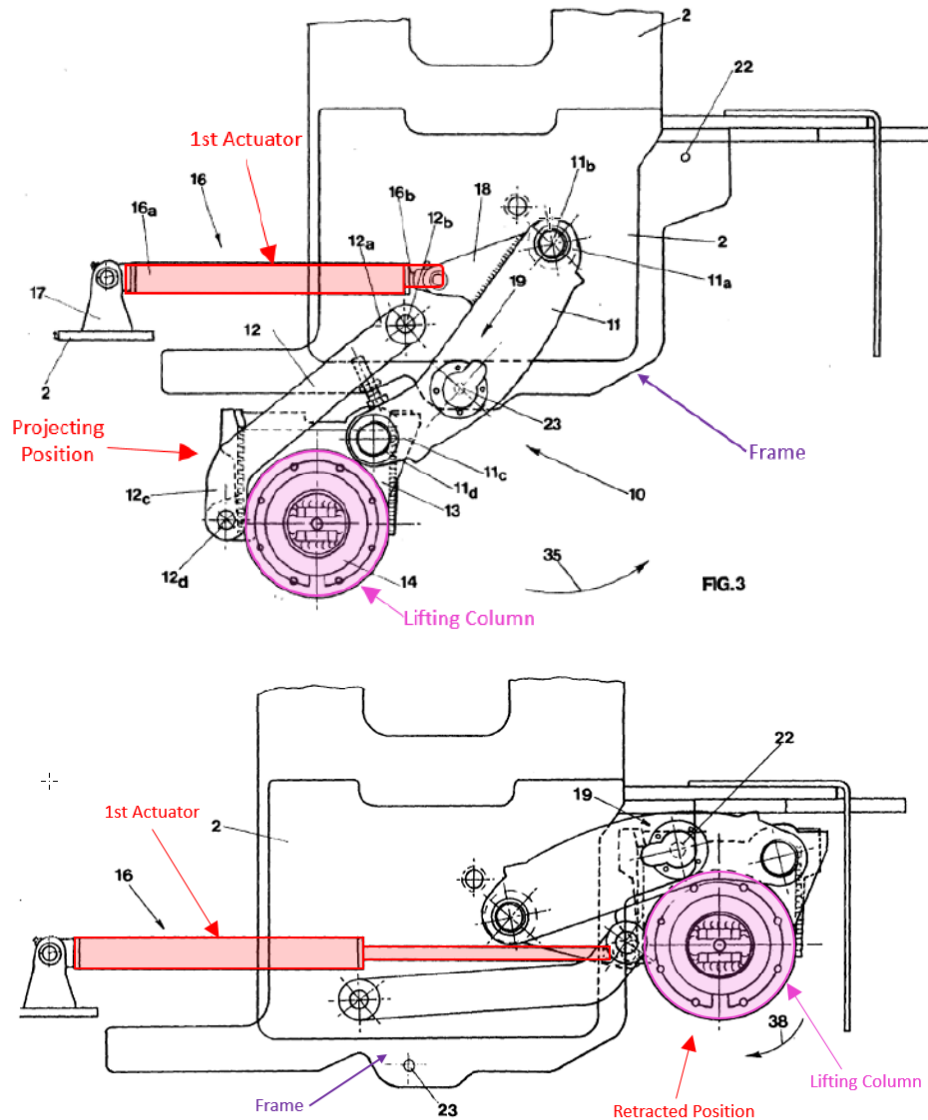
jack 14 ‘allows the lifting and the lowering of the machine.’” Pet. 24 (quoting Ex. 1011 ¶ 23); *see also* Ex. 1011 ¶ 23 (“An hydraulic jack 14 connects the plate 13 to the frame 2 and allows the lifting and the lowering of the machine according to the directions of the arrow 15 in order to adjust the milling depth of the drum 6.”). We find that this presentation in the Petition, along with its supporting evidence, demonstrates, by a preponderance of the evidence, that Bitelli teaches or suggests the subject matter of support device limitation.

Accordingly, upon review of the information in the Petition and corresponding evidence, and considering Patent Owner’s arguments, we find Petitioner has proven, by a preponderance of the evidence, on the complete trial record, that the combination of Bitelli and Feliz teaches or suggests the subject matter of the “support device” limitation of claim 18.

d) The first actuator limitation

Claim 18 also recites “a first actuator connected to said support device and adapted to move said at least one ground engaging unit between projecting and retracted positions relative to said machine frame.” Ex. 1001, 11:43–46 (the “first actuator” limitation of claim 18). Petitioner contends that Bitelli’s hydraulic cylinder 16 corresponds to the recited first actuator. Pet. 26 (referencing Ex. 1011 ¶¶ 24–25; Ex. 1003 ¶¶ 132–135). Petitioner explains that hydraulic cylinder 16 moves a ground engaging unit between protected and retracted positions. *Id.*; *see id.* at 27 (providing annotated versions of Bitelli’s Figures 3 and 5, illustrating hydraulic cylinder 16 (identified as the first actuator) connected to the support device at bracket 18 and moving the lifting column (which is connected to a ground engaging

unit) between a retracted and projected position). We reproduce the Petition's annotated versions of Bitelli's Figures 3 and 5, below.



EX1011, FIGS. 3, 5 (annotated).

Pet. 27. These annotated images depict “a top view of a detail of the scarifying machine,” showing the use of actuator 16 to extend and retract Bitelli's rear wheel assembly. Ex. 1011 ¶¶ 17, 25–26. Actuator 16 is shown in red and labeled “1st Actuator.” Hydraulic jack 14 is shown in purple and labeled “Lifting Column.”

Patent Owner responds that “the [P]etition never argues that [the identified first actuator] is connected to a support device.” PO Resp. 16. Recognizing that, in our Institution Decision, we preliminarily determined that cylinder 16 is connected to arm 11 by bracket 18, Patent Owner argues that the Petition does not make that argument. *Id.* Patent Owner argues that “[t]he [P]etition’s discussion of [the first actuator limitation] never even mentions the requirement that the first actuator be ‘connected to said support device,’ let alone explains how Bitelli satisfies this requirement.” *Id.* at 16–17.

Patent Owner argues that, with respect to the support device limitation, “[t]he [P]etition provides a straightforward identification of the purported support device” and does not show that the first actuator is connected to the support device. PO Resp. 17; *see also id.* (providing an annotated image that captures Petitioner’s annotations of Bitelli’s Figure 3 for the support device and first actuator limitations).

Petitioner replies that it identifies hydraulic cylinder 16 as the first actuator cites to Bitelli’s paragraphs 24 and 25. Petitioner adds that Bitelli’s paragraph 25 “describes a ‘first hydraulic cylinder marked with 16 as a whole, having . . . a movable stem 16b fixed to a bracket 18 belonging to a first arm 11.’” Pet. Reply 4. Petitioner adds that Bitelli connects cylinder 16 to arm 11 in a similar arrangement as described in the ’995 patent. *See id.* at 5.

Patent Owner replies that the Petition’s citation to Bitelli was in support to the disclosure of cylinder 16 in general. PO Sur-reply 3–4. Patent Owner adds that the Petition fails to satisfy its burden when it never

mentions that the first actuator must be connected to the support device. *Id.* at 4.

We have considered Petitioner’s arguments and evidence, and Patent Owner’s counterarguments and find, on the complete trial record, that Petitioner demonstrates, by a preponderance of the evidence, that Bitelli teaches or suggests the subject matter of the first actuator limitation of claim 18. Bitelli’s Figure 3 depicts a top view of the articulation unit 10, “[w]hen the articulation unit 10 and the wheel 5 integral with it are placed . . . in the projecting position.” Ex. 1011 ¶¶ 17, 42. As is seen from the figure above, bracket 18 is connected to arm 11 in such a way as to be integral with it. *See also id.* ¶ 25 (disclosing that bracket 18 “belong[s] to a first arm 11”). As such, we find that the information in the Petition proves that cylinder 16 is connected to arm 11, part of the support device.

We recognize that the Petition does simply state that the connection requirement of the first actuator limitation is satisfied by the connection of one end of cylinder 16 with bracket 18.¹³ The question we must answer is whether the information in the Petition adequately presents the information to put the Board and Patent Owner on notice of Petitioner’s position. We find that it does. The information in the Petition clearly shows the first actuator connected to bracket 18 and bracket 18 clearly connected to arm 11. *See* Pet. 27 (providing an annotated version of Bitelli’s Fig. 3, showing the actuator connected to bracket 18 and bracket 18 connected to arm 11), Pet. 24 (same). This information alone provides sufficient information to

¹³ We also recognize that the Petition includes certain inconsistencies with respect to bracket 18. We address these inconsistencies in our analysis of claim 30, below.

understand the Petition’s contentions. The Petition, however, also cites to Bitelli’s paragraph 25. This paragraph expressly states that bracket 18 *belongs to* arm 11. Ex. 1011 ¶ 25. Finally, the Petition’s position was clear to us at the time of institution, and we put Patent Owner on notice of that position in our Institution Decision. Inst. Dec. 37–38.

Accordingly, upon review of the information in the Petition and corresponding evidence, and considering Patent Owner’s arguments, we find Petitioner has proven, by a preponderance of the evidence, on the complete trial record, that the combination of Bitelli and Feliz teaches or suggests the subject matter of the “first actuator” limitation of claim 18.

e) The second actuator limitation

Claim 18 further recites “a second actuator connected to said lifting column and adapted to cause at least a portion of said lifting column to rotate about said lifting column axis relative to said machine frame.” Ex. 1001, 11:47–50 (the “second actuator” limitation of claim 18). Petitioner contends that Feliz’s rotary actuator corresponds to the recited second actuator. Pet. 28 (referencing Ex. 1012, 9:1–46; Ex. 1003 ¶¶ 136–144). Petitioner explains how Feliz’s actuator is located at the upper portion of its lifting column and connected to the inner tube of the lifting column to steer drive wheels 4. *Id.* at 29–34; *see also id.* at 29–33 (providing annotated versions of Feliz’s Figures 3 and 4 and identifying certain components in support of Petitioner’s contentions).

Upon review of the information in the Petition and corresponding evidence, including Petitioner’s reasons to combine the teachings of Bitelli and Feliz, we find Petitioner has made a sufficient proven by a preponderance of the evidence, on the complete trial record, that the

combination of Bitelli and Feliz teaches or suggests the subject matter of the “second actuator” limitation of claim 18.

Patent Owner does not dispute Petitioner’s contentions with respect to this claim limitation. Patent Owner does dispute Petitioner’s motivation contentions to arrive at this subject matter. We address those arguments separately above.

f) The spaced apart limitation

Finally, claim 18 recites “said second actuator being positioned at a location linearly spaced apart from said first actuator along said lifting column axis.” Ex. 1001, 11:50–52 (the “spaced apart” limitation of claim 18). Petitioner contends that, based on its proposed modification, the first actuator would be located near the lower portion of the lifting column and the second actuator would be located at the upper portion of the lifting column, spaced apart vertically from the first actuator. Pet. 34–36 (referencing Ex. 1011 ¶ 25; Ex. 1003 ¶¶ 145–149); *see, e.g., id.* at 36 (providing an annotated version of Bitelli’s Figure 2, showing the proposed location of the two actuators).

Upon review of the information in the Petition and corresponding evidence, including Petitioner’s reasons to combine the teachings of Bitelli and Feliz, we find Petitioner has made a sufficient proven by a preponderance of the evidence, on the complete trial record, that the combination of Bitelli and Feliz teaches or suggests the subject matter of the “spaced apart” limitation of claim 18.

Patent Owner does not dispute Petitioner’s contentions with respect to this claim limitation. Patent Owner does dispute Petitioner’s motivation

contentions to arrive at this subject matter. We address those arguments separately above.

g) Conclusion – claim 18

For the reasons discussed above, we conclude, on complete trial record, that Petitioner proves, by a preponderance of the evidence, that claim 18 is unpatentable under 35 U.S.C. § 103 over the combination of Bitelli and Feliz.

3. Dependent claims 19, 20, 29–31, and 33

Petitioner also contends that dependent claims 19, 20, 29–31, and 33 are unpatentable as obvious over the combination of Bitelli and Feliz. Pet. 17, 40–47. Patent Owner disputes Petitioner’s contentions with respect to claim 30. PO Resp. 36–37. We address these claims below.

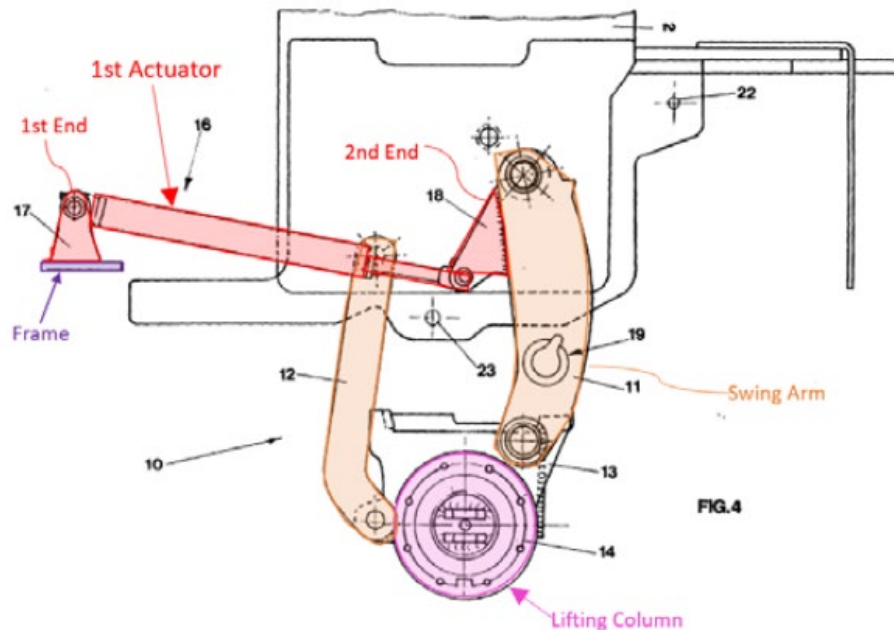
a) Dependent claims 29 and 30

Claim 29 depends from claim 18 and recites “wherein said support device includes a swing arm having a first end portion connected to said machine frame and a second end portion connected to said lifting column.” Ex. 1001, 12:39–42. Claim 30 depends from claim 29 and recites “wherein said first actuator is a linear actuator having a first end connected to said machine frame and a second end connected to said swing arm.” *Id.* at 12:43–46. Patent Owner disputes Petitioner’s contentions with respect to claim 30. Because claim 30 depends from claim 29, we begin our analysis there.

Petitioner contends that Bitelli’s arm 11 has a first end connected to the frame and a second end connected to hydraulic jack 14. Pet. 42; *see also id.* (providing an annotated image of Bitelli’s Figure 4, showing the connection points). Upon review of the information in the Petition and

corresponding evidence, including Petitioner’s reasons for modifying Bitelli with Feliz’s teachings, we find that Petitioner has proven, by a preponderance of the evidence, that the combination of Bitelli and Feliz teaches or suggests the subject matter of claim 29. Patent Owner does not dispute these contentions.

With respect to claim 30, Petitioner contends that Bitelli discloses the recited configuration of claim 30. Pet. 43. Petitioner provides an annotated version of Bitelli’s Figure 3, which we reproduce below.



EX1005, FIG. 3 (annotated).

Pet. 43. This annotated figure depicts Bitelli’s arrangement of hydraulic cylinder 16, arms 11 and 12, and hydraulic jack 14, used to extend and retract the rear wheel assembly of Bitelli’s machine. *See* Ex. 1011 ¶¶ 22–25.

Patent Owner argues that “Petitioner identifies bracket 30 (*sic*, bracket 18) as part of the first actuator,” which “is inconsistent with Petitioner’s previous identification of Bitelli’s hydraulic cylinder 16 as the

alleged first actuator.” PO Resp. 36; *see also id.* at 37 (comparing the Petition’s annotated figure from Bitelli supporting its contentions with respect to the first actuator limitation of claim 18 with the Petition’s annotated figure from Bitelli supporting its contentions with respect to claim 30). Patent Owner argues that “Petitioner does not even attempt to explain why a [person having ordinary skill in the art] would have viewed bracket 18 as a ‘second end’ of the purported first actuator nor . . . acknowledge, let alone explain, its inconsistent identification of the purported first actuator.” *Id.* at 37.

Petitioner replies that “[a]s shown in both annotated figures of Bitelli, movable stem 16b of Bitelli’s hydraulic cylinder 16 is connected to arm 11 via bracket 18.” Pet. Reply 23. Patent Owner replies that Petitioner’s “unexplained contradictions fail to rehabilitate the [P]etition’s flawed challenge to claim 30.” PO Sur-reply 12.

We have considered Petitioner’s arguments and evidence, and Patent Owner’s counterarguments and find, on the complete trial record, that Petitioner demonstrates, by a preponderance of the evidence, that Bitelli teaches or suggests the subject matter of claim 30. Although we recognize that Petitioner’s positions with respect to claims 18 and 30 seem to be inconsistent, we find that any inconsistency is not fatal to Petitioner’s positions. We believe that the *best* reading of Bitelli is that bracket 18 is part of arm 11. *See* Ex. 1011 ¶ 25 (describing “first hydraulic cylinder marked with 16 as a whole, having a body 16a connected to a flange 17 fixed to a frame 2 and a movable stem 16b fixed to a bracket 18 belonging to a first arm 11”). As such, cylinder 16’s “second end” connects to arm 11 at bracket 18. Regardless of whether bracket 18 is part of cylinder 16 or arm

11, Bitelli's Figure 3 clearly shows that cylinder 16 is connected to arm 11 at one end of the cylinder, as required by the first actuator limitation of claim 18 and claim 30.

Accordingly, upon review of the information in the Petition and corresponding evidence, including our analyses of claim 18 and 29, and considering Patent Owner's arguments, we find Petitioner has proven, by a preponderance of the evidence, on the complete trial record, that the combination of Bitelli and Feliz teaches or suggests the subject matter of claim 30.

b) Dependent claims 19, 20, 31, and 33

Claims 19, 20, 31, and 33 depend directly from claim 18. Petitioner provides citations to evidence of record, including Bitelli and Feliz, and Mr. Orr's testimony on how the combination of Bitelli and Feliz teaches or suggests the subject matter of these claims. Pet. 40–42, 44–47. Upon review of the information in the Petition and corresponding evidence, including our analysis of claim 18, we find Petitioner has proven, by a preponderance of the evidence, on the complete trial record, that the combination of Bitelli and Feliz teaches or suggests the subject matter of claims 19, 20, 31, and 33.

4. Conclusions, Ground 1

Based on the analysis above, we conclude that Petitioner has proven, by a preponderance of the evidence, independent claim 18 and dependent claims 19, 20, 29–31, and 33 are unpatentable under 35 U.S.C. § 103 over Bitelli and Feliz.

E. Ground 2: Claims 1–9, 11–15, 17, 21–27, 32, 35–40, 42, 44–55, 57–61, and 63 as unpatentable over Bitelli, Feliz, and Skotnikov

Petitioner contends that the combined teachings of Bitelli, Feliz, and Skotnikov render obvious the subject matter of claims 1–9, 11–15, 17, 21–27, 32, 35–40, 42, 44–55, 57–61, and 63. Pet. 17, 48–91. Patent Owner disputes aspects of this Ground. PO Resp. 38–51. We address Petitioner’s contention and Patent Owner’s counterarguments, below.

1. Ground 1-based arguments

Patent Owner argues that many claims challenged under Ground 2 (claims 1–9, 11–15, 17, 21–27, 32, 35, 45–55, 57–61, and 63) suffer from the same deficiencies as Patent Owner identifies for Ground 1. As we indicate above, in connection with our analysis of Ground 1, we do not agree with Patent Owner that Ground 1 suffers from the argued deficiencies. As such, we need not address these concerns further here.

2. Motivation to combine

a) Petitioner’s contentions

Petitioner contends that a person having ordinary skill in the art “would have been motivated to combine the teachings of Skotnikov’s controller with Bitelli’s machine, as modified by Feliz, to coordinate actuation of the first and second actuators, thereby automating movement of Bitelli’s swing wheel more efficiently while improving the machine’s maneuverability.” Pet. 55 (referencing Ex. 1003 ¶¶ 216–223). Petitioner contends that

Skotnikov . . . teaches a “[c]ontrol circuit 164 . . . coupled to rotatable assemblies 114, 115 . . . to provide control signals to assemblies 114, 115 . . . to steer wheels 108.” Skotnikov’s “control circuit 164 controls wheel assemblies 108 to perform a

number of . . . turning functions” based on sensor feedback “to more properly distribute [vehicle] weight,” thereby “prevent[ing] rollover of the work vehicle.”

Id. at 56 (referencing Ex. 1008, 4:62–68, 5:34–37, 5:63–67).

Petitioner contends that a person having ordinary skill in the art “would have been motivated to combine Skotnikov’s control circuit with Bitelli’s modified machine to controllably actuate the first and second actuators in coordination to precisely control wheel placement.” Pet. 57 (referencing Ex. 1003 ¶ 223). Petitioner contends that “[u]sing a controller to actuate the Bitelli-Feliz’s actuators would adjust the orientation of Bitelli’s moveable rear wheel according to sensor feedback, ensuring that vehicle weight is properly adjusted for steering.” *Id.* Petitioner adds that Skotnikov’s controller is programmed to ‘calculate[] any error in the wheel width’ based on sensor input and ‘adjust the positions of the wheels to correct for the error.’” *Id.* (referencing Ex. 1008, 5:14–18).

Petitioner contends that a person having ordinary skill in the art would have had a reasonable expectation of success that the modification would arrive at the claimed invention “because Skotnikov’s controller would perform its same intended function on the Bitelli-Feliz’s actuators.” Pet. 57 (referencing Ex. 1003 ¶¶ 224–227); *see also id.* at 57–58 (providing an example of how Skotnikov teaches controlling actuators).

b) Patent Owner’s responsive arguments

Patent Owner responds that “Petitioner overlooks that Bitelli’s machine already has the functionality that supposedly would have motivated the further combination with Skotnikov.” PO Resp. 41. Patent Owner argues that Bitelli’s four-bar linkage maintains the wheels orientation as articulation unit 10 pivots the rear wheel assemble. *Id.*

c) Petitioner's and Patent Owner's reply arguments

Petitioner replies that Patent Owner's responsive argument ignores Petitioner's reasoning that the proposed modification would improve steering. Pet. Reply 24. Petitioner explains that the four-bar linkage in Bitelli "does not adjust the wheel orientation during a turning maneuver. *Id.* (referencing Dr. Klopp's deposition testimony allegedly confirming Petitioner's position that Bitelli does not steer the rear wheels).

Patent Owner replies that Petitioner's argument in reply attempts to rewrite the Petition's motivation argument. PO Sur-reply 14. Patent Owner argues that Petitioner admits that Bitelli already maintains the wheel orientation. *Id.*

d) Analysis and findings – motivation to combine

We find, on the complete trial record, that Petitioner had proven, by a preponderance of the evidence, that a person having ordinary skill in the art would have been motivated to add Skotnikov's control system to the Bitelli-Feliz machine "to improve the machine's maneuverability." *See* Pet. 55. Petitioner contends that

A [person having ordinary skill in the art] would have been motivated to combine Skotnikov's control circuit with Bitelli's modified machine to controllably actuate the first and second actuators in coordination to precisely control wheel placement[, to] . . . adjust the orientation of Bitelli's moveable rear wheel according to sensor feedback, ensuring that vehicle weight is properly adjusted for steering.

Id. at 57. That is, using Skotnikov's controller's feedback capability ensures that Bitelli's rear wheels are in a correct position to steer the rear wheels. And steering the rear wheels is the reason behind adding Feliz's second actuator.

We have considered Patent Owner’s argument and find, on the complete record, that it too narrowly construes Petitioner’s position. Petitioner argues functionality beyond the capability of Bitelli’s four-bar linkage. *See* Pet. 55–57.

3. *Independent claims 1 and 36 - “Second Actuator”*

Claim 1 recites, in relevant part,

a second actuator associated with said at least one ground engaging unit, wherein the second actuator is a rotary actuator . . . adapted to cause at least a portion of the lifting column to rotate about the lifting column axis and to maintain the same rotational direction of said at least one ground engaging unit in each of said projecting and retracted positions.

Ex. 1001, 10:11–19 (the “second actuator” claim limitation of claim 1). Similarly, claim 36 recites, in relevant part, the step of “actuating a second . . . actuator . . . to rotate said one ground engaging unit about said lifting column axis in a manner coordinated with the actuation of said first actuator to maintain the same rotational direction of said ground engaging unit in each of said projecting and retracted positions.” *Id.* at 13:20–28 (the “second actuator” claim limitation of claim 36).¹⁴

Petitioner relies on Feliz’s teachings of a second actuator. *See* Pet. 51 (addressing claim 1), 60 (referencing the analysis of claim 1 for the related step in claim 36). Petitioner relies on Skotnikov’s teachings of a controller for the ability to maintain the same rotational direction of said at least one ground engaging unit in each of said projecting and retracted positions. *See id.* at 52–53.

¹⁴ Patent Owner also argues against a similar limitation in independent claim 45. *See* PO Resp. 43–44. We separately address claim 45, and claims that depend from claim 45, below.

Patent Owner responds that it is Bitelli's four-bar linkage, and not Skotnikov's controller, that would keep wheel 5 in the same rotational direction in the projecting and retracted positions. PO Resp. 43.

Petitioner replies that the claims do not have a temporal limitation, such that the second actuator would need to maintain the ground engaging unit in the same rotation direction simultaneous with the first actuator moving the leg assembly. Pet. Reply 25–26. Petitioner also argues that, when performing a steering maneuver, the second actuator would need to adjust the wheel orientation after the maneuver. *Id.* at 26. Petitioner asserts that Skitnikov's controller would cause the second actuator to perform these maneuvers, including orienting the wheels in the forward-facing direction after a turn. *Id.*

Patent Owner replies that Petitioner's reply argument constitutes a new argument, which we should "not entertain." PO Sur-reply 17. Patent Owner argues that Petitioner's argument results in a "tortured reading" of the claims. *Id.* at 18. Patent Owner argues that "Petitioner identifies no basis in the claims' plain language, the specification, or the prosecution history for its new claim construction argument that the claims are satisfied" as argued by Petitioner.

We have considered Petitioner's and Patent Owner's arguments and supporting evidence and find that Petitioner has proven, by a preponderance of the evidence, that its proposed modification satisfies the requirements of claims 1 and 36 and, specifically, the requirement that the second actuator operate in a manner to maintain the same rotational direction of said ground engaging unit in the projecting and the retracted positions. As an initial matter, we note that Patent Owner seems to appreciate Petitioner's position,

despite labeling it as “confusing.” *See* PO Sur-reply 17 (explaining Petitioner’s theory). Petitioner contends that at times other than when the leg assembly is being moved into a projected or retracted position, the second actuator functions to return the wheels to a forward-facing orientation. *See* Pet. Reply 26 (stating that the “second actuator . . . steer[ing] a rear wheel during a turning maneuver would require the second actuator to also adjust and maintain the wheel orientation after completing a turning maneuver”); PO Sur-reply 17.

We do not agree with Patent Owner that Petitioner’s reply argument represents a new argument. In determining whether an argument is a proper argument in reply, we look to see if the reply argument is responsive to an argument from Patent Owner and expands on a position in the Petition. *See Rembrandt Diagnostics, LP*, 76 F.4th at 1384 (“[W]e have held that a reply may be proper if it is responsive and simply expands on previously raised arguments.”). Or, if Petitioner relies on previously unidentified disclosure “to make a meaningfully distinct contention.” *Id.* at 1383 (“[W]e held that a petitioner who asserted in its reply previously unidentified prior-art disclosures ‘to make a meaningfully distinct contention’ was impermissibly raising a new theory of unpatentability.”). We find that Petitioner’s argument in reply is closer to the former situation.

The purpose of Petitioner modifying Bitelli with Feliz’s teachings of a second actuator is to allow the rear wheels to be steered. *See* Pet. 37 (“A [person having ordinary skill in the art] would have been motivated to connect a steering actuator to Bitelli’s lifting column . . . so Bitelli’s rear wheel 5 has steering capability, thereby preventing the rear wheels from scraping the ground during turning.”). As such, the Petition’s starting point

is a modified machine that steers. Such a machine would not be useful if it could not return the rear wheels to a forward-facing orientation following a turning maneuver. In this way, Petitioner’s argument in reply responds to Patent Owner’s argument and expands on (or, more accurately, explains the logical consequence of) Petitioner’s position in the Petition. *See, e.g.*, Ex. 1040 ¶ 61 (“[U]sing a second actuator to steer a rear wheel during a turning maneuver would require the second actuator to also adjust and maintain the wheel orientation after completing a turning maneuver so that Bitelli’s machine may travel straight again[, which] . . . is achieved through the teachings of Skotnikov’s controller.”).¹⁵

We do not agree with Patent Owner that Petitioner’s reading of the second actuator claim limitation of claims 1 and 36 is tortured. Instead, Petitioner applies the plain and ordinary meaning of the claim, that does not impose a restriction as to when the second actuator adapted to cause the lifting column to maintain the same rotational direction of the rear wheels in each of said projecting and retracted positions. And, in connection with turning maneuvers, Petitioner’s proposed modification includes a second actuator that is adapted to operate as claimed when steering the rear wheels, in a manner coordinated with the first actuator, that is, in a manner where the wheels are oriented in a direction coordinated with how the first actuator has oriented the leg assembly, either in a projected or retracted orientation. Tellingly, claim 36, which recites a method, does *not* recite actuating a first *and* second actuator together—it merely recites actuating the second actuator

¹⁵ We credit this testimony from Mr. Orr for at least the reason that it logically flows from Petitioner’s proposed modification.

in a step that *follows* a step of actuating the first actuator. *See* Ex. 1001, 13:16–28.

With respect to claims 1 and 36 as a whole, Petitioner provides citations to evidence of record, including Bitelli, Feliz, Skotnikov, and Mr. Orr’s testimony on how the combination of Bitelli, Feliz, and Skotnikov teaches or suggests the subject matter of these claims. Pet. 48–55, 58–62. Other than its arguments with respect to the second actuator limitation, Patent Owner does not dispute Petitioner’s contentions for claims 1 and 36. Upon review of the information in the Petition and corresponding evidence, including our analysis of Petitioner’s reasons to combine Bitelli, Feliz, and Skotnikov, and our analysis of claim 18, we find Petitioner has proven, by a preponderance of the evidence, on the complete trial record, that the combination of Bitelli, Feliz, and Skotnikov teaches or suggests the subject matter of independent claims 1 and 36.

4. Dependent claims 2–9, 11–15, 17, 21–27, 32, 35, 37–40, 42, and 44

Petitioner contends that claims 2–9, 11–15, 17, 21–27, 32, 35, 37–40, 42, and 44, which ultimately depend from claim, claim 18, or claim 36, are unpatentable as obvious over Bitelli, Feliz, and Skotnikov. Patent Owner disputes Petitioner’s contentions with respect to claims 21, 22, and 35. We address this dispute first.

a) Dependent claims 21, 22, and 35

Claim 21 depends from claim 18 and recites

a controller associated with and adapted to coordinate the actuation of said first and second actuators, said machine including at least a rotation sensor adapted to produce an alignment signal indicative of the rotational position of said at least one ground engaging unit relative to said machine frame,

said rotation sensor being connected to deliver said alignment signal to said controller.

Ex. 1001, 11:60–67. Claim 22 depends from claim 21 and recites “wherein said controller receives said alignment signal from said rotation sensor and responsively actuates said second actuator to maintain the rotational direction of said at least one ground engaging unit.” *Id.* at 12:1–5. Claim 35 depends from claim 18 and recites

controller associated with and adapted to coordinate the actuation of said first and second actuators, and including a pivot sensor adapted to produce a position signal indicative of the position of said at least one ground engaging unit relative to said machine frame between said projecting and retracted positions, said pivot sensor being connected to deliver said position signal to said controller.

Id. at 12:66–13:6.

With respect to claim 21, Petitioner contends that Skotnikov teaches control circuitry, “operatively connected to the first and second actuators.” Pet. 71 (referencing Ex. 1008, 5:2–4; Ex. 1003 ¶¶ 347–352). Petitioner adds that Skotnikov discloses sensor 155, that is associated with an actuator and monitors the angular position of a wheel. *Id.* at 72 (referencing Ex. 1008, 4:4–8; Ex. 1003 ¶¶ 353–357).

With respect to claim 22, Petitioner contends that Skotnikov teaches a control circuit that receives an alignment signal and signals an actuator to orient the wheels so the machine travels in a straight line. Pet. 73 (referencing Ex. 1008, 5:1–24; Ex. 1003 ¶¶ 358–361).

With respect to claim 35, Petitioner contends that Skotnikov teaches the control circuitry and sensor 154 to arrive at the subject matter of claim 35. Pet. 89–90 (referencing Ex. 1008, 5:1–15; Ex. 1003 ¶¶ 419–425).

Patent Owner responds, similar to its argument directed to the second actuator limitations of claims 1 and 36, that Bitelli's four-bar linkage, not a controller, would maintain the orientation of a rear wheel. PO Resp. 44 (referencing Ex. 2004 ¶ 69). Patent Owner argues that "the controller would not actuate a second actuator to "maintain the rotational direction" of Bitelli's wheel in the proposed combination." *Id.* at 45 (referencing Ex. 2004 ¶ 70).

Petitioner does not directly reply to Patent Owner's arguments directed to claims 21, 22, and 35, but we understand Petitioner's Reply generally to argue that the controller would operate to maintain the wheel orientation following a turning maneuver. *See* Pet. Reply 25–26. Similarly, Patent Owner replies to the argument associated with the second actuator limitation of claims 1 and 36 generally. *See* PO Sur-reply 15–19.

We have considered Patent Owner's argument and find, on the complete trial record, that it does not identify a deficiency in Petitioner's contentions. Claims 21, 22, and 35 require a controller to be adapted to maintain wheel orientation in a manner coordinated with the actions of a first actuator. Consistent with our discussion above in connection with our analysis of claims 1 and 36, Skotnikov's controller would receive signals from the rotational sensor associated with the second actuator to maintain the orientation of the wheels following a turning maneuver so the wheels are oriented in a straight-ahead configuration. This move would be coordinated with whatever action the first actuator took, that is, whether the leg assembly is in a retracted or projected configuration, as indicated by a pivot sensor. *See* Pet. 51–53, 71–73; Pet. Reply 15–26; Ex. 1003 ¶¶ 199–210, 347–361.

Upon review of the information in the Petition and corresponding evidence, including our analysis of Petitioner's reasons to combine Bitelli, Feliz, and Skotnikov, our analysis of claim 18, and Patent Owner's arguments, we find Petitioner has proven, by a preponderance of the evidence, on the complete trial record, that the combination of Bitelli, Feliz, and Skotnikov teaches or suggests the subject matter of claims 21, 22, and 35.

b) Dependent claims 2–9, 11–15, 17, 23–27, 32, 37–40, 42, and 44

Dependent claims 2–9, 11–15, 17, 23–27, 32, 37–40, 42, and 44 depend, directly or indirectly, from either independent claim 1 or independent claim 18. Petitioner provides citations to evidence of record, including Bitelli, Feliz, Skotnikov, and Mr. Orr's testimony on how the combination of Bitelli, Feliz, and Skotnikov teaches or suggests the subject matter of dependent claims 2–9, 11–15, 17, 23–27, 32, 37–40, 42, and 44. Pet. 69–71, 72–89, 90–92. Upon review of the information in the Petition and corresponding evidence, including our analysis of Petitioner's reasons to combine Bitelli, Feliz, and Skotnikov, and our analysis of claims 1, 18, 21, and 36, we find Petitioner has proven, by a preponderance of the evidence, on the complete trial record, that the combination of Bitelli, Feliz, and Skotnikov teaches or suggests the subject matter of independent claims 2–9, 11–15, 17, 23–27, 32, 37–40, 42, and 44.

5. Conclusion – Ground 2, claims 1–9, 11–15, 17, 21–27, 32, 35–40, 42, and 44

Based on the analysis above, we conclude that Petitioner has proven, by a preponderance of the evidence, independent claims 1 and 36 and

dependent claims 2–9, 11–15, 17, 21–27, 32, 35, 37–40, 42, and 44 are unpatentable under 35 U.S.C. § 103 over Bitelli, Feliz, and Skotnikov.

6. *Independent Claim 45 – Means-Plus-Function limitations*

As we discussed above in our claim construction analysis, independent claim 45 includes means-plus-function claim limitations. “[A] challenger who seeks to demonstrate that a means-plus-function limitation was present in the prior art must prove that the corresponding structure—or an equivalent—was present in the prior art.” *Fresenius USA, Inc.*, 582 F.3d at 1299. As Patent Owner argues and we find, the Petition does not identify corresponding structure from the Specification of the ’995 patent. *See* PO Resp. 45–51. Accordingly, Petitioner is not able to prove that the prior art teaches or suggests the means-plus-function limitations of independent claim 45.

So, we conclude, on the complete trial record, that Petitioner has not proven, by a preponderance of the evidence, independent claim 45 is unpatentable under 35 U.S.C. § 103 over Bitelli, Feliz, and Skotnikov.

7. *Dependent Claims 46–55, 57–61, and 63*

Petitioner also contends that dependent claims 46–55, 57–61, and 63 are unpatentable as obvious over the combination of Bitelli, Feliz, and Skotnikov. Pet. 17, 68–88. Because these claims depend, directly or indirectly, from claim 45, we conclude, on the complete trial record, that Petitioner has not proven, by a preponderance of the evidence, that dependent claims 46–55, 57–61, and 63 are unpatentable under 35 U.S.C. § 103 over Bitelli, Feliz, and Skotnikov.

8. *Summary – Ground 2*

In summary, for Ground 2, we conclude that Petitioner has proven, by a preponderance of the evidence, that claims 1–9, 11–15, 17, 21–27, 32, 35–40, 42, and 44 are unpatentable under 35 U.S.C. § 103 over Bitelli, Feliz, and Skotnikov. Petitioner has not proven, by a preponderance of the evidence, that claims 45–55, 57–61, and 63 are unpatentable under 35 U.S.C. § 103 over Bitelli, Feliz, and Skotnikov.

F. Ground 3: Claims 10, 28, 41, and 56 as unpatentable over Bitelli, Feliz, Skotnikov, and McColl

Petitioner further contends that the combined teachings of Bitelli, Feliz, Skotnikov, and McColl render obvious the subject matter of claims 10, 28, 41, and 56 (Ground 3). Pet. 18, 92–95.

For claim 10, which depends indirectly from claim 1, claim 28, which depends indirectly from claim 18, and claim 41, which depend indirectly from claim 36, Petitioner provides citations to evidence of record, including McColl, and Mr. Orr’s testimony on how the combination of Bitelli, Feliz, Skotnikov, and McColl teaches or suggests the subject matter of these dependent claims. Pet. 92–94. Petitioner also provides arguments and evidence as to why a person having ordinary skill in the art would have combined the teachings of McColl to the combined teachings of Bitelli, Feliz, and Skotnikov, with a reasonable expectation of success. *Id.* at 94–95.

Upon review of the information in the Petition and corresponding evidence, we find that the combined teaching of Bitelli, Feliz, Skotnikov, and McColl teaches or suggests the subject matter of claims 10, 28, and 41. Patent Owner does not dispute Petitioner’s contentions directed to these

claims. *See* PO Resp. 51 (arguing the patentability of claims challenged under Ground 3 based on deficiencies argued for Ground 2).

For claim 56, which depends indirectly from claim 45, we conclude that claim 56 is not proven unpatentable for at least the reason that it depends from independent claim 45, which is not proven unpatentable.

In summary, for Ground 3, we conclude that Petitioner has proven, by a preponderance of the evidence, that claims 10, 28, and 41 are unpatentable under 35 U.S.C. § 103 over Bitelli, Feliz, Skotnikov, and McColl. Petitioner has not proven, by a preponderance of the evidence, that claim 56 is unpatentable under 35 U.S.C. § 103 over Bitelli, Feliz, Skotnikov, and McColl.

III. CONCLUSION

After considering all the evidence and arguments presently before us, we conclude Petitioner has proven, by a preponderance of the evidence, that claims 1–15, 17–42, and 44, are unpatentable. We conclude Petitioner has not proven, by a preponderance of the evidence, that claims 45–61, and 63 are unpatentable.¹⁶

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

In summary:

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
18–20, 29–31, 33	103(a)	Bitelli, Feliz	18–20, 29–31, 33	
1–9, 11–15, 17, 21–27, 32, 35–40, 42, 44–55, 57–61, 63	103(a)	Bitelli, Feliz, Skotnikov	1–9, 11–15, 17, 21–27, 32, 35–40, 42, 44	45–55, 57–61, 63
10, 28, 41, 56	103(a)	Bitelli, Feliz, Skotnikov, McColl	10, 28, 41	56
Overall Outcome			1–15, 17–33, 35–42, 44	45–61, 63

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, Petitioner has proven by a preponderance of the evidence that claims 1–15, 17–33, 35–42, and 44 of U.S. Patent No. 7,523,995 B2 are unpatentable;

FURTHER ORDERED that Petitioner has not proven by a preponderance of the evidence that claims 45–61, and 63 of U.S. Patent No. 7,523,995 B2 are unpatentable;

FURTHER ORDERED that, pursuant to 35 U.S.C. § 318(b), upon expiration of the time for appeal of this decision, or the termination of any

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such appeal, a certificate shall issue canceling claims 1–15, 17-33, 35–42, and 44 of U.S. Patent No. 7,523,995 B2; and

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

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