

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZODIAC POOL SYSTEMS, INC.,
Petitioner,

v.

AQUA PRODUCTS, INC.,
Patent Owner.

Case IPR2013-00159
Patent 8,273,183 B2

Before BRIAN J. McNAMARA, RAMA G. ELLURU, and
JAMES B. ARPIN, *Administrative Patent Judges*.

ARPIN, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. BACKGROUND

Zodiac Pool Systems, Inc. (“Petitioner”) filed a Petition to institute an *inter partes* review (Paper 5) of claims 1–14, 16, and 19–21 of U.S. Patent No. 8,273,183 B2 (Ex. 1006; “the ’183 Patent”) pursuant to 35 U.S.C. §§ 311–312 and 37 C.F.R. §§ 42.100–42.106. Pursuant to 35 U.S.C. § 314,

we instituted an *inter partes* review, on August 23, 2013, as to claims 1–9, 13, 14, 16, and 19–21 of the '183 Patent, but not with respect to claims 10–12. Paper 18.

After institution, Patent Owner filed a Response to Petition (Paper 28) and a contingent, Replacement Corrected Motion to Amend Claims (Paper 42).¹ Petitioner filed a Reply to Patent Owner's Response to Petition (Paper 44) and an Opposition to Patent Owner's Replacement Corrected Motion to Amend Claims (Paper 45). Patent Owner further filed a Corrected Reply in Support of Motion to Amend Claims (Paper 55) and a Corrected Sur-Reply in Support of Opposition to Petition (Paper 56).

In addition, Patent Owner filed a Motion to Exclude Evidence. Paper 58. Petitioner filed an Opposition to Patent Owner's Motion to Exclude Evidence (Paper 61), and Patent Owner filed a Reply Memorandum in Support of its Motion to Exclude Evidence (Paper 62). The Motion to Exclude Evidence seeks to exclude certain portions of the declaration of Petitioner's declarant, Mr. Keith McQueen, (Ex. 1009) and the entire declaration of Petitioner's declarant, Dr. Homayoon Kazerooni, (Ex. 1010). Paper 58, 1–5.

An oral hearing was held on May 20, 2014, a transcript of which appears in the record. Paper 70.

We have jurisdiction under 35 U.S.C. § 6(c). This final written decision is entered pursuant to 35 U.S.C. § 318(a).

¹ Patent Owner initially filed a Motion to Amend Claims (Paper 27) on Nov. 25, 2013, and a Corrected Motion to Amend Claims (Paper 39) on Feb. 18, 2014. Because we required Patent Owner to refile the Corrected Motion to Amend Claims, the motion under consideration in this case was filed on Mar. 3, 2014.

For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that challenged claims 1-9, 13, 14, 16, and 19–21 are *unpatentable*. Further, for the reasons that follow, we *deny* the Replacement Corrected Motion to Amend Claims requesting entry of substitute claims 22–24.

Patent Owner’s Motion to Exclude Evidence is *granted-in-part* and *denied-in-part*.

A. Related Proceedings

In addition to this proceeding, the ’183 Patent is involved in concurrent district court litigation captioned *Aqua Products, Inc. v. Zodiac Pool Systems, Inc.*, 1:12-cv-09342-TPG (S.D.N.Y.). *See* Paper 5, 1.

B. The ’183 Patent

The ’183 Patent relates to self-propelled apparatus and methods for controlling such apparatus for cleaning a submerged surface of a pool or tank. Ex. 1006, col. 1, ll. 22–26. Although such apparatus are propelled by a water jet, the ’183 Patent states that the movement of such apparatus is random. *Id.* at col. 2, ll. 57–59. The ’183 Patent describes methods for controlling the scanning and traversing patterns of the cleaning apparatus with respect to the bottom and sidewalls of the pool or tank. *Id.* at col. 1, ll. 22–26. In the ’183 Patent, “[r]eferences to the front or forward end of the cleaner will be relative to its then-direction of movement.” *Id.* at col. 4, ll. 11–12.

An apparatus, as recited in the claims and suitable for control according to the recited methods, is illustrated in Figure 1 of the ’183 Patent,

reproduced below:

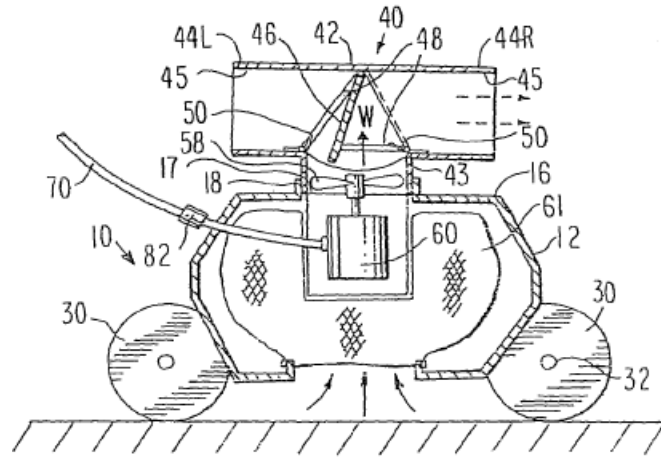


FIG. 1

Figure 1 depicts “a side elevation, partly in cross-section, of a pool cleaner illustrating one embodiment of the directional water jet of the invention.”

Ex. 1006, col. 7, ll. 1–3.

Figure 1, a schematic illustration of a cross-sectional, side view of pool or tank cleaner apparatus 10, depicts an embodiment of the directional water jet, or discharge conduit, recited in claims 1 and 20. Ex. 1006, col. 7, ll. 1–3. A water inlet (not numbered) is disposed through housing 12 and below motor-driven water pump motor 60, whereby pump motor 60 draws water and pool or tank debris through the water inlet for filtering. *Id.* at col. 8, ll. 58–61. Water drawn through the water inlet may pass through filter 61, and pool or tank debris may be entrained by filter 61. *Id.* Pool cleaner 10 further comprises valve assembly 40 forming a pump outlet that is mounted above pump motor 60. *Id.* at col. 9, ll. 4–12. Pool cleaner 10 uses impeller 58 to drive water “W” through housing aperture 17 and into valve assembly 40. *Id.* at col. 9, ll. 4–8.

As depicted in the embodiment of Figure 1 of the ’183 Patent, “valve

assembly 40 comprises a generally T-shaped valve housing 42 with depending leg 43 having a first end that is secured to cleaner housing flange 18, and a second end that is in fluid communication with discharge conduits 44R and 44L.” *Id.* at col. 9, ll. 8–12. In Figure 1, the angle formed between the surface over which pool cleaner 10 is moving and discharge conduits 44R and 44L is equal to or is substantially equal to zero, *i.e.*, discharge conduits 44R and 44L are substantially parallel to the surface of movement. Thus, discharge conduits 44R and 44L are at acute angles, *i.e.*, angles less than 90° (*see* claim 1) or less than normal (*see* claim 20) with respect to the surface of movement. *Id.* at col. 9, ll. 7–11. Pool cleaner 10 is propelled by the water jet created by the selective ejection of water from pump motor 60 directed by flap assembly 46 through one of discharge conduits 44R and 44L. *Id.* at col. 9, ll. 24–53; Figs. 1–3.

Alternatively, an apparatus, as recited in the claims and suitable for control according to the recited methods, is illustrated in Figure 9 of the '183 Patent, reproduced below:

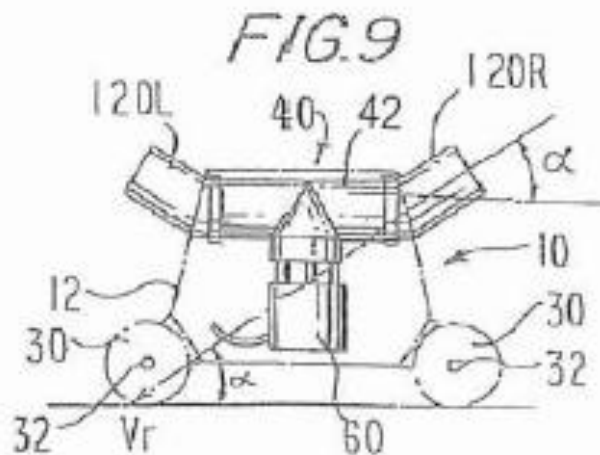


Figure 9 depicts a side elevation of embodiment illustrated in relation to a pool cleaner. Ex. 1006, col. 7, ll. 20–21.

In Figure 9, a preferred embodiment of pool cleaner 10 is depicted having valve assembly 40 in which discharge conduits 44R and 44L through their associated elbows 120R and 120L project through the sidewalls of a pool cleaner housing 12 at angle α that is less than 90° and greater than 0° , i.e., is acute or less than normal, with respect to the surface of movement of pool cleaner 10. *Id.* at col. 10, ll. 47–48, 60–64; *see id.* at col. 24, ll. 6–25; col. 26, ll. 1–24 (Claims 1 and 20). Thus, the direction of movement may change depending upon which conduit ejects the water. *Id.* In the alternative embodiment depicted in Figure 9, elbows 120R and 120L cause a resultant force vector component generated by the water jet to move housing 12 in a direction away from the discharged water jet and another resultant force vector component to urge housing 12 downward against the pool or tank surface over which pool cleaner 10 moves. *Id.* at col. 10, ll. 47–51; Fig. 8. Pool cleaner 10 further comprises rotationally-mounted supports, i.e., wheels 30 mounted on a pair of axles 32. *Id.* at col. 10, ll. 47–66. Each of axles 32 is disposed proximate to one of a front and an opposing rear end of pool cleaner 10, as defined by the direction of movement. *Id.* at col. 10, l. 64–col. 11, l. 3; *see also id.* at col. 5, ll. 9–12 (“[R]eferences to the front and rear of the cleaning apparatus or its housing will be with respect to the direction of its movement.”).

C. Claims Under Review

1. Challenged Claims.

Of the challenged claims, claims 1, 20, and 21 are independent. Independent claims 1 and 20 recite similar limitations describing embodiments of a self-propelled cleaning apparatus for cleaning a

submerged surface of a pool or tank. Ex. 1006, col. 24, ll. 6–7; col. 26, ll. 1–2. Independent claim 21 recites “[a] method for cleaning a submerged surface of a pool or tank.” *Id.* at col. 26, ll. 25–26. As to the dependent claims, challenged claims 2-9, 13, 14, 16, and 19 depend from claim 1.

Independent claim 21 of the ’183 Patent is illustrative of the claims at issue:

21. A method for cleaning a submerged surface of a pool or tank, comprising the steps of:

providing a self-propelled cleaning apparatus, said cleaning apparatus including a housing having a baseplate with at least one water inlet, and further including a front portion as defined by the direction of movement of the cleaning apparatus when propelled by a water jet, an opposing rear portion and adjoining side portions defining the periphery of the apparatus, rotationally-mounted supports coupled to the housing to enable movement of said apparatus over the submerged surface, a water pump mounted in the interior of said housing, and a directional discharge conduit in fluid communication with the water pump and having at least one discharge opening;

activating the water pump to draw water and debris from the pool or tank through the at least one water inlet; filtering the water drawn into the housing;

discharging the filtered water through the directional discharge conduit at an acute angle with respect to the surface over which the apparatus is moving, said discharged filtered water forming a water jet having a resultant force vector acutely angled towards the surface beneath the apparatus; and

propelling the apparatus in a forward direction of movement.

2. *Proposed Substitute Claims*

In its Replacement Corrected Motion to Amend Claims, Patent Owner proposes claims 22–24, as substitute claims for original claims

1, 8, and 20, respectively. Paper 42, 2. The substitute claims are reproduced below, with underlined material indicating language added to the corresponding original claims and struck-through indicating language removed from the corresponding original claims:

22. (Proposed substitute for original claim 1) A self-propelled cleaning apparatus for cleaning a submerged surface of a pool or tank, comprising:

a housing having a front portion as defined by the direction of movement of the apparatus when propelled by a water jet, an opposing rear portion and adjoining side portions defining the periphery of the apparatus, and a baseplate with at least one water inlet;

rotationally-mounted supports axially mounted transverse to a longitudinal axis of said apparatus and coupled proximate the front and rear portions of the housing to enable control the directional movement of said apparatus over the submerged surface;

a water pump mounted in the interior of said housing, said water pump being configured to draw water and debris from the pool or tank through the at least one water inlet for filtering; and

a stationary directional discharge conduit in fluid communication with the water pump and having at least one discharge opening through which a pressurized stream of water forming the water jet is directionally discharged at a predetermined angle that is acute with respect the surface over which the apparatus is moving,

wherein said predetermined angle is inclined upwardly with respect to the surface beneath the apparatus to produce a resultant force vector that is directed to a position that is proximate to and rearwardly displaced from a line passing through the transverse axial mountings of the front rotationally-mounted supports.

23. (Proposed substitute for original claim 8) The apparatus of claim ~~[[7]]~~ 22, wherein the rotationally-mounted

supports comprise first and second pairs of axially mounted wheels respectively positioned proximate to the front and rear portions of the housing, wherein a portion of the discharge conduit terminating in the at least one discharge opening is angled upward with respect to an adjacent portion of the discharge conduit to produce a resultant force vector in the water jet discharged from said at least one discharge opening that is directed to pass through proximately to and rearwardly of the plane of the axis of rotation of the pair of wheels at the front portion of the apparatus.

24. (Proposed substitute for original claim 20) A self-propelled cleaning apparatus for cleaning a submerged surface of a pool or tank, said apparatus having a longitudinal axis and being propelled by the discharge of a water jet, the apparatus comprising:

a housing including a baseplate with at least one water inlet, a front portion, a rear portion and opposing side portions defining the periphery of the apparatus, said front portion being defined with respect to the forward directional movement of the apparatus when propelled by the water jet;

~~rotationally mounted supports~~ at least a front pair of wheels, each wheel axially mounted transverse to the longitudinal axis and coupled to the housing to ~~enable~~ control the directional movement of said apparatus over the submerged surface;

a water pump mounted in the interior of said housing, said water pump configured to draw water and debris from the pool or tank through the at least one water inlet for filtering, and a pump discharge outlet for emitting a pressurized stream of filtered water;

a stationary directional discharge conduit in fluid communication with the pump discharge outlet, the discharge conduit having at least one discharge opening through which the filtered water jet is directionally discharged from the apparatus at a predetermined angle

that is less than normal with respect to the surface beneath the apparatus, wherein said predetermined angle is inclined upwardly with respect to the surface beneath the apparatus to produce a resultant force vector that is directed to a position that is proximate to and rearwardly displaced from a line passing through the transverse axial mountings of the front pair of wheels.

Id. at 2-5.

D. Grounds of Unpatentability

Petitioner relies upon the following prior art references and declarations to support the grounds upon which we instituted an *inter partes* review:

Exhibit No.	References and Declarations
1001	U.S. Patent No. 3,321,787 to R.R. Myers (“Myers”), issued May 30, 1967
1002	U.S. Patent No. 3,936,899 to Henkin et al. (“Henkin”), issued Feb. 10, 1976
1003	U.S. Patent No. 4,100,641 to Pansini (“Pansini”), issued July 18, 1978
1009	Declaration of Mr. Keith McQueen in Support of Petitioner’s Reply to Patent Owner’s Response to Petition (Mar. 10, 2014) (“Declaration of Mr. McQueen”)
1010	Declaration of Homayoon Kazerooni, Ph.D. in support of Petitioner’s Reply to Patent Owner’s Response to Petition and Petitioner’s Opposition to Patent Owner’s Replacement Corrected Motion to Amend Claims (Mar. 10, 2014) (“Declaration of Dr. Kazerooni”)

We instituted *inter partes* review of the '183 Patent based upon the following asserted grounds of unpatentability:

Claims	Statutory Basis	Applied Reference(s)
1, 2, 13, 14, 16, and 19–21	35 U.S.C. § 102(b)	Myers
1–5 and 19–21	35 U.S.C. § 103(a)	Henkin and Myers
1–9 and 19–21	35 U.S.C. § 103(a)	Pansini and Myers

Paper 18, 34.

II. DISCUSSION

In the Response to Petition, Patent Owner only addresses claim 21 and does not address expressly claims 1-9, 13, 14, 16, 19, and 20. Paper 28, 1–2. Nevertheless, although Patent Owner waived argument on all of the claims other than claim 21 and then filed the Replacement Corrected Motion to Amend Claims on other claims, Patent Owner does not concede that the original claims, other than claim 21, would not be patentable. Paper 70, 22:7–24; *see* Paper 42, 2, n.2. We have reviewed the evidence presented by Petitioner regarding the claims upon which we instituted *inter partes* review and determine that, for the reasons set forth below, Petitioner has shown by a preponderance of the evidence that claims 1-9, 13, 14, 16, and 19–21 are unpatentable.

A. Claim Construction

Consistent with the statute and legislative history of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), the Patent Trial and Appeal Board (“the Board”) interprets claims using the broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *see also* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012). Under the broadest reasonable construction standard, claim terms are given their ordinary and customary meaning as would be understood by one of ordinary skill in the art in the context of the specification. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007) (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc)). Any special definition for a claim term must be set forth in the specification with “reasonable clarity, deliberateness, and precision.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). We are careful, however, not to read a particular embodiment appearing in the written description into the claim if the claim language is broader than the embodiment. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). Our analysis requires the construction of the following claim terms.

1. a stationary directional discharge conduit

As noted in our Decision to institute *inter partes* review, claim 1 limits the apparatus to “*a stationary directional discharge conduit*,” and independent claims 20 and 21 recite “*a directional discharge conduit*.” Ex. 1006, col. 24, l. 20; col. 26, ll. 19, 36-37 (emphases added). Further, we note that Patent Owner includes this limitation of claim 1 in substitute claims 22–24. Paper 42, 2–5. Referring to the language of claim 1 and to

the Specification, we found no definition for a stationary directional discharge conduit. Although the Specification describes various embodiments of such discharge conduits, e.g., discharge conduits 44R and 44L (Ex. 1006, col. 9, ll. 8–12), we do not limit the interpretation of this term to such embodiments. *Van Geuns*, 988 F.2d at 1184.

Considering the language of claim 1, a relevant definition of the term “stationary” is “not moving or not movable; fixed or still.” WEBSTER’S NEW WORLD DICTIONARY, 1309 (3rd College ed. 1988) (Ex. 3002). Moreover, a relevant definition of the term “directional” is “of, aimed at, or indicating (a specific) direction.” *Id.* at 389. Petitioner noted that, during prosecution, Patent Owner argued in overcoming the Examiner’s proposed Restriction Requirement that

[A] pool cleaner apparatus [that] employs *at least one* discharge opening through which the water jet is directionally discharged from the cleaning apparatus at a predetermined angle that is less than normal with respect to the surface beneath the apparatus. *At least one* angled discharge outlet 120R and/or 120L extends from the jet valve assembly 40, as described in paragraphs 0091 through 0094 and shown in Figs. 8 and 9 of the present application.

Paper 5, 6 (quoting Response to Restriction/Election Requirement (Ex. 1005) 2 (emphases added)).

Neither Patent Owner nor Petitioner contests this construction. We further note that claim 6, which depends directly from claim 1, recites that “the discharge conduit has *at least two* discharge openings, each of which discharge openings is located at opposite ends of the discharge conduit” (Ex. 1006, col. 24, ll. 44–46 (emphasis added)). Thus, “a stationary directional discharge conduit” of claim 1 broadly includes conduits with one

or more discharge openings, and we also apply this interpretation to the use of this term in the substitute claims.² Therefore, consistent with the language of claim 1, the description in the Specification, and the prosecution history of the '183 Patent, we conclude that the broadest reasonable interpretation of “a stationary directional discharge conduit” is one or more discharge conduits, each of which is stationary and is oriented in a particular direction, e.g., that does not move and is aligned relative to a given axis of the apparatus. *See KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1356 (Fed. Cir. 2000) (“an indefinite article ‘a’ or ‘an’ in patent parlance carries the meaning of ‘one or more’ in open-ended claims containing the transitional phrase ‘comprising’”) (citations omitted).

2. *a front portion as defined by the direction of movement of the apparatus when propelled by a water jet*

Independent claim 1 recites, and claim 21 similarly recites, that a housing has “a front portion *as defined by the direction of movement of the apparatus when propelled by a water jet.*” Ex. 1006, col. 24, ll. 8–10; col. 26, ll. 29–31 (emphasis added). Patent Owner includes this limitation in substitute claims 22 and 23. Independent claim 20 and substitute claim 24 similarly recite that “said front portion *being defined with respect to the forward directional movement* of the apparatus when propelled by the water jet.” Ex. 1006, col. 26 ll. 7–10; Paper 42, 2 (emphasis added).³ As used in

² Other claims can be valuable sources in determining the meaning of a claim term. *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). Because claim terms normally are used consistently throughout the claims, the usage of a term in one claim can illuminate the meaning of the same or similar terms in other claims. *See Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342 (Fed. Cir. 2001); *CVI/Beta Ventures, Inc. v. Tura LP*, 112 F.3d 1146, 1159 (Fed. Cir. 1997).

³ *See supra* n.2.

each of these claims, this language describes the front portion based on (1) the direction of movement of the apparatus, and (2) the time, e.g., “when” the apparatus is propelled “by a water jet.”

As we explained in our Decision to institute *inter partes* review, with respect to the first basis for describing the “front portion,” the Specification states that the movement of the apparatus is random. Paper 18, 10–11 (citing Ex. 1006, col. 2, ll. 57–59; col. 5, ll. 4–9). The Specification further explains that the “[r]eference to the front or forward end of the cleaner will be *relative* to its *then*-direction of movement.” *Id.* at col. 4, ll. 11–12 (emphases added); *see id.* at col. 5, ll. 9–12. Thus, we concluded that the “front portion” of the housing may change with time, and no single portion of the housing may be identified exclusively as the “front portion.”

Similarly, with respect to the second basis for describing the “front portion,” i.e., “when” the apparatus is propelled by a water jet, the Specification states that “the invention comprehends a method of propelling a pool or tank cleaner by means of a water jet that is discharged [from a discharge conduit] in *at least* a first and a second direction that result in opposite translational directions.” *Id.* at col. 4, ll. 50–54 (emphasis added). Nevertheless, we do not interpret the language of claim 1 as limited to such an embodiment. The scope of this limitation is determined by the number and direction of orientation of the discharge conduits.

First, claim 1, as well as substitute claims 22–24, recites that the apparatus comprises “*a stationary directional discharge conduit.*” *Id.* at col. 24, l. 20; Paper 42, 3, 4 (emphasis added). As noted above, under the broadest reasonable interpretation, this limitation describes one or more such conduits. Second, although embodiments of the invention are depicted as

having opposing discharge conduits, e.g., discharge conduits 44R and 44L, as noted above, we do not read a particular embodiment appearing in the Specification into the claim, especially if, as here, the claim language is broader than the particular embodiment. *Van Geuns*, 988 F.2d at 1184; see Ex. 1006, Figs. 1, 9 (depicting discharge conduits 44R and 44L). Third, during prosecution, Applicants argued that the claimed apparatus employ “*at least one* discharge opening through which the water jet is directionally discharged.” Paper 5, 6 (quoting Response to Restriction/Election Requirement (Ex. 1005) 2 (emphasis added)). This argument is consistent with the language of claims 1 and 6, as discussed above in Section II.A.1.

Patent Owner argues that the “front” of the recited apparatus “remains constant in terms of the direction of movement” and, in particular, “[t]he front portion of Patent Owner’s cleaner remains *in constant alignment with the water jet* which is propelling the cleaner in ‘**a forward** direction’” (emphasis added). Paper 28, 4–5 (citing the language of claim 21). Petitioner disagrees. Paper 44, 2–4.

Patent Owner does not identify support in the claim language or in the Specification for its argument regarding the “constant alignment” of the front of the apparatus with the water jet. Patent Owner relies instead on a dictionary definition of the indefinite article “a” (Ex. 2014) and on Mr. Giora Erlich’s declaration (Ex. 2016 ¶¶ 55–56). Paper 28, 5. With respect to the dictionary definition, Mr. Erlich’s interpretation of the indefinite article “a” is inconsistent with the recitation in claim 6 of an apparatus having multiple conduit openings. Further, Mr. Erlich bases his opinion on the depiction of the apparatus in Figure 1A of the ’183 Patent to demonstrate that “a single ‘front portion’ . . . remains in constant alignment with the

water jet.” Ex. 2016 ¶ 56.

On this evidence, however, we are not persuaded to read the limitations of this depicted embodiment of the Specification into the claims. *Van Geuns*, 988 F.2d at 1184. Consistent with the language of the claims, the disclosure of the Specification, and the prosecution history, we interpret this limitation as providing that the location of the front portion on the apparatus varies with the movement of the apparatus, both over time and depending upon the number and direction of orientation of one or more discharge conduits through which the water jet is discharged.

3. an opposing rear portion and adjoining side portions

Independent claims 1 and 21 recite that the front portion, together with “an opposing rear portion and adjoining side portions” define the periphery of the apparatus. Ex. 1006, col. 24, l. 10; col. 26, ll. 31-33; Abstract. Patent Owner includes this limitation in proposed substitute claims 22 and 23. Paper 42, 2–3. Independent claim 20 and proposed substitute claim 24 similarly recite “a front portion, a rear portion and opposing side portions defining the periphery of the apparatus.” Ex. 1006, col. 26, ll. 6–7; Paper 42, 4. The Specification states that “references to the front *and rear* of the cleaning apparatus or its housing will be with respect to the direction of its movement.” Ex. 1006, col. 5, ll. 10–12 (emphasis added). Consistent with the broadest reasonable interpretation of the “front portion,” as set forth above, the “rear portion” is opposite to the “front portion” of the apparatus and, like the front portion, the location of the rear portion on the apparatus varies with the movement of the apparatus, both over time and depending upon the number and direction of orientation of one or more discharge conduits through which the water jet is discharged.

Because the side portions adjoin the front and rear portions, as with the front and rear portions, we interpret the location of the side portions on the apparatus to vary with the movement of the apparatus, both over time and depending upon the number and direction of orientation of one or more discharge conduits through which the water jet is discharged. Therefore, the rear and side portions are defined relative to the varying front portion.

4. *rotationally-mounted supports coupled proximate the front and rear portions of the housing*

Independent claim 1 recites “rotationally-mounted supports coupled proximate the front and rear portions of the housing.” Ex. 1006, col. 24, ll. 13–14. Claim 21 similar recites “rotationally-mounted supports coupled to the housing.” *Id.* at col. 26, ll. 33–34. We find no express definition, in the Specification or agreed upon by the parties, for rotationally-mounted supports. Patent Owner includes this limitation in substitute claims 22 and 23. The Specification, however, describes that

[A] further object of the invention is to provide an improved apparatus and method for varying the position of one or more of *the wheels or other support means* of the cleaner in order to vary the directional movement and scanning patterns of the apparatus with respect to the bottom surface of the pool or tank being cleaned.

Ex. 1006, col. 3, ll. 35–40 (emphasis added). The Specification also describes that the cleaner may move “on *supporting wheels, rollers or tracks* that are aligned with the longitudinal axis of the cleaner body when it moves in a straight line.” *Id.* at col. 4, ll. 8–11 (emphasis added). Referring, for example, to Figure 1, wheels 30 mounted on axles 32 are depicted as disposed at either end of pool cleaner 10.

A definition of the verb “to support” is “to carry or bear (a specific weight, strain, pressure, etc.),” and a definition of the noun “support” is “a person or thing that supports, esp. financially.” WEBSTER’S NEW WORLD DICTIONARY (Ex. 3002) at 1345. A definition of the noun “rotation” is “rotating or being rotated.” *Id.* at 1168. Thus, we interpret the term “rotationally-mounted supports” to recite two or more things (including, but not limited to wheels, rollers, and tracks) that carry or bear the housing of the apparatus and which are mounted to the housing, so that the supports may rotate or turn, for example, on an axis.⁴ Nevertheless, because the front and rear of the apparatus are determined by its direction of movement at any particular point in time, whether the rotationally-mounted supports are “coupled proximate to the front and rear portions of the housing” depends upon the direction of movement of the apparatus at a given time.

5. *towards the surface beneath the apparatus*

Independent claim 21 recites “said discharged filtered water forming a water jet having a resultant force vector acutely angled *towards the surface beneath the apparatus.*” Ex. 1006, col. 26, ll. 45– 48 (emphasis added). Independent claim 20 recites a limitation similar to that of claim 21. Independent claim 1, however, recites that “a pressurized stream of water forming the water jet is directionally discharged at a predetermined angle that is acute *with respect the surface over which the apparatus is moving.*” *Id.* at col. 26, ll. 22– 25 (emphasis added). Each of these limitations

⁴ Substitute claim 23 recites that “the rotationally-mounted supports *comprise* first and second pairs of axially mounted wheels respectively positioned proximate to the front and rear portions of the housing.” Paper 42, 3 (emphasis added). Differences among claims can be a useful in understanding the meaning of particular claim terms. *See Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1538 (Fed. Cir. 1991).

describes the force or the direction of the water jet with respect to the “surface,” rather than with respect to the apparatus. In proposed substitute claims 22 and 24, Patent Owner further limits the recitations of original claims 1 and 20, respectively, such that the angles of the force and of the direction of the water jet are described relative to the front rotationally-mounted supports or pairs of wheels.

With respect to the recitations of claims 20 and 21, a relevant definition of the preposition “towards” is “in the direction of,” and a relevant definition of the preposition “beneath” is “below; lower than.” WEBSTER’S NEW WORLD DICTIONARY (Ex. 3002) at 129, 1414-15. Thus, we conclude that these limitations describe the surface beneath the apparatus, but are not limited to the relative dispositions of the rotationally-mounted supports. With respect to claim 1, however, the corresponding limitation refers more broadly to the surface “over which the apparatus is moving.” Consequently, with respect to claim 1, the predetermined angle may be acute with regard to any portion of that surface, regardless whether or not it lies *beneath* the apparatus. *See* Paper 42, 10–11 (quoting the deposition of Mr. Erlich regarding the criticality of the angle with respect to the apparatus and the surface). We construe the corresponding limitations of substitute claims 22–24 more narrowly than original claims 1, 8, or 20 in view of the added recitations describing the angles relative to the positions of the front, rotationally-mounted supports or pairs of wheels. *Cf.*, *e.g.*, Ex. 1006, col. 24, ll. 28–34, 38–43 (Claims 3, 5).

6. Remaining Claim Terms or Phrases

All remaining claim terms and phrases recited in the challenged or substitute claims are given their ordinary and customary meanings,

consistent with the Specification, as would be understood by one with ordinary skill in the art, and need not be construed explicitly here.

B. Grounds for Review

1. Anticipation by Myers

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987) (citations omitted). Petitioner argues that Myers discloses, expressly or inherently, each and every element of claims 1, 2, 13, 14, 16, and 19–21. Paper 5, 8–11, 21–23, 26–27, 40–42, 45–47, 52–53.

Figures 1 and 2 of Myers are reproduced below, including Petitioner’s annotations. *See* Paper 5, 8 (depicting annotated versions of Myers’s Figs. 1 and 2).

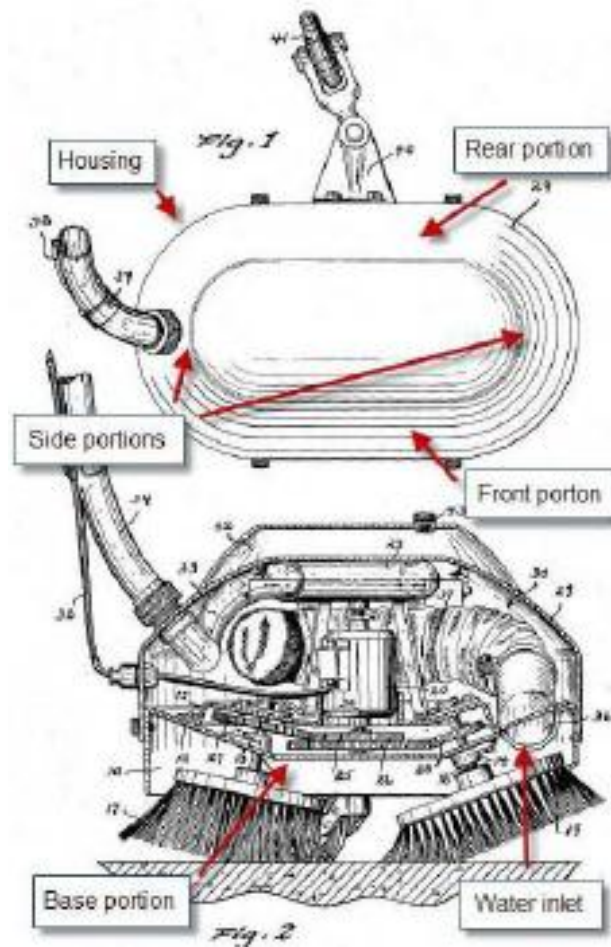


Figure 1 depicts a top plan view of a swimming pool cleaning means according to Myers's invention, and Figure 2 depicts a cross-sectional view of the swimming pool cleaning means, as depicted in Myers's Figure 1.

Ex.1001, col. 1, ll. 42–43.

Petitioner annotated these figures to identify elements of Myers's device corresponding to the housing, including front, rear, and side portions; the base portion, e.g., the baseplate; and the water inlet. In view of our claim interpretation, the identifications of the front, rear, and side portions in Petitioner's annotated Figure 2 are merely illustrative of those portions at a point in time.

Referring to Figures 1 and 2, Petitioner argues that Myers depicts "a

self-propelled cleaning apparatus for cleaning a submerged surface of a pool or tank.” Paper 5, 8; *see* Ex. 1006, Claim 21 (preamble). In particular, Myers indicates that the disclosed “invention relates to a swimming pool cleaning device and more particularly to a cleaning means that is erratically self-propelled over the bottom surface of the swimming pool.” Paper 5, 8 (quoting Ex. 1001, col. 1, ll. 8–11). Moreover, Petitioner argues that Myers’s device includes the claimed “housing,” i.e., hood 29, having front, opposing rear, and adjoining side portions, which define the periphery of the device. Paper 5, 8. Further, Petitioner argues that Myers’s device includes a baseplate, i.e., outer area 12, through which a water inlet, i.e., passageway 36, communicates with the outside of the device. *Id.*; *see* Ex. 1001, col. 1, 50–52; col. 2, ll. 22–24.

Referring to Figure 2, Myers depicts “a surface engaging element such as a brush or like 17” which is “rotatably mounted” on shafts at either end of hood 29. Ex. 1001, col. 1, ll. 55–61. Petitioner argues that surface engaging elements 17 correspond to the rotationally-mounted supports, as recited in claim 1. Paper 5, 8.

Finally, referring to Figure 2, Myers discloses that flexible conduit 33 may be connected to outlet opening 32 of rotary pump 13 and may pass through and terminate just beyond hood 29. Ex. 1001, col. 2, ll. 8–13. An elongated, flexible conduit, e.g., hose 34, may be attached *detachably* to the outlet portion of conduit 33 and may extend to a point outside the swimming pool. *Id.* at col. 2, ll. 13–18. Myers further explains that:

[I]f the electric motor is operated as a motor, and the conduit 33 is detached [from conduit 34], *the water exiting from the unit and into the pool will provide a jet force to move the unit.* Also due to the gear wheel sizes and other placed elements more weight will be borne on by one brush than the other brush. This

is particularly true if the conduit 33 is attached.

Id. at col. 3, ll. 6–12 (emphasis added). Thus, Petitioner argues that Myers discloses the directional discharge conduit, as recited in claim 21, as well as the stationary directional discharge conduit, as recited in claim 1. Paper 5, 10–11.

Patent Owner disagrees (1) with our claim construction regarding the recitation in claim 21 of “a front portion as defined by the direction of movement of the cleaning apparatus when propelled by a water jet” (*see supra* Section II.A.2) and (2) with Petitioner’s reading of Myers’s disclosure on the language of claim 21. Paper 28, 3–7. First, Patent Owner contends that “even if the ‘front’ changes on reversal of movement, the ‘front’ nonetheless remains constant in terms of the direction of movement.” *Id.* at 4. Thus, Patent Owner contends that we erred in concluding that “the front portion of the housing may change with time, and no single portion of the housing may be identified exclusively as the front portion.” Paper 18, 11. Consequently, Patent Owner contends that “[t]he front portion of Patent Owner’s cleaner remains in constant alignment with the water jet which is propelling the cleaner in ‘a forward direction.’” Paper 28, 5. As we noted above, the challenged claims simply do not include any recitation regarding a “constant alignment” between the front portion of the apparatus and the water jet.

Patent Owner further argues that

the water jet of the Myers’ cleaner provides an ancillary force vector that contributes to the intended erratic, and not necessarily forward, movement of the cleaner. [Ex. 2016 ¶¶ 57, 60.] This ancillary force vector works in conjunction with the single projecting swivel wheel and the pair of brushes that are

axially mounted at an acute angle displaced slightly from the vertical to create erratic movement. *Id.* at 60[.]

Paper 28, 5. Nevertheless, as we have discussed, the front of the apparatus is determined by the direction of movement. Even accepting that Myers's apparatus may engage in erratic movement, such movement still may define a front portion at any given time. Further, erratic movement is not necessarily inconsistent with "propelling the apparatus *in a forward direction* of movement," as recited in claim 21. Ex. 1006, col. 26, ll. 49–50 (emphasis added); *compare* Paper 70, 23:23–24:2 ("[T]he fact is that once that front starts, once there is a correlation, once there is a movement, there is a front, the direction of motion are related. Therefore, structurally there has to be sometimes both a front and a direction -- forward direction of movement"), *with id.* at 9:3–9:6 ("There's nothing to – there's nothing in this claim that would exclude not only forward directions of movement but sideways directions of movement, components of movement that are caused by not only the jet drive but also the configuration of the apparatus.")). Patent Owner's apparatus is not limited solely to movement in a forward direction. Ex. 1006, col. 5, ll. 4–9 ("The invention comprehends methods and apparatus for controlling the movement of robotic tank and swimming pool cleaners that can be characterized as systematic scanning patterns, scalloped or curvilinear patterns *and controlled random motions with respect to the bottom surface of the pool or tank.*" (emphasis added)); *see also* Paper 70, 6:14–24 (discussing curvilinear movement depicted in Ex. 1006, Fig. 35). We agree with Patent Owner that Myers describes that its device moves "erratically" across the bottom surface of the pool. *See* Ex. 1001, col. 1, ll. 8–11, 22–24; col. 2, l. 34–col. 3, l. 5. We determine, however, that Myers's

device has an identifiable, if varying, “front portion” consistent with our interpretation of the limitation recited in claim 21.

In addition, although the movement of Myers’s device may be influenced by the rotation of surface engaging elements 17 (Ex. 1001, col. 2, l. 55–col. 3, l. 5), such additional influences are not precluded by the language of claim 21. Further, we note that the “propelling limitation” of claim 21 does not limit the form of propulsion and, in particular, does not recite that the apparatus is propelled in a forward direction only by the water jet. Thus, like Myers, the movement of the recited apparatus also may be the result of the contributions of separate elements. Paper 44, 2–4; *see* Paper 70, 49:4–20. Therefore, we are not persuaded by Patent Owner’s arguments that Myers fails to disclose any of the recited elements of claim 21.

Patent Owner contends that the reasons discussed above for distinguishing the claimed invention over Myers over claim 21, apply to remaining challenged claims, claims 1, 2, 13, 14, 16, 19, and 20, as well. Paper 70, 22:7–17. We conclude that Petitioner has demonstrated by a preponderance of the evidence that claims 1, 2, 13, 14, 16, and 19–21 of the ’183 Patent are anticipated by Myers.

2. *Henkin and Myers*

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter 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 skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Petitioner argues that Henkin discloses substantially all of the limitations of challenged claims 1-5 and 19–21, except that Henkin discloses the use of an external pump, rather than an internal pump. *See* Paper 5, 13 (Claim 1), 48 (Claim 20), 54 (Claim 21). Like Myers, Henkin discloses an apparatus for cleaning submerged surfaces of a pool. Ex. 1002, col. 1, ll. 46–59. Myers, however, teaches the use of an internal pump, e.g., ordinary rotary pump 23. *See* Paper 5, 13 (Claim 1), 48 (Claim 20), 54 (Claim 21). Petitioner argues that a person of ordinary skill in the relevant art would have had a reason to modify the teachings of Henkin to replace the external pump with an internally-mounted pump to eliminate (1) the need for an external source of pressurized water and supply hose and (2) the need to manage the supply hose to prevent entanglement. *Id.* We agree.

Patent Owner argues that the method recited in claim 21 is distinguishable over Henkin and Myers for at least two reasons. Paper 28, 7–10. First, Patent Owner notes that claim 21 recites “said discharged filtered water forming a water jet having *a resultant force vector acutely angled towards the surface beneath the apparatus.*” *Id.* at 7 (citing Ex. 1006, col. 26, ll. 45– 48 (emphasis added)). Patent Owner contends, however, that Henkin fails to teach or suggest this limitation. *Id.*; *see also* Paper 5, 27 (depicting a resultant force vector aligned with Henkin’s nozzle 90 angled acutely towards the surface over which Henkin’s apparatus moves). Second, Patent Owner contends that neither Henkin nor Myers

provides a person of ordinary skill in the art with a reason to combine the teachings of these references to achieve the invention recited in the challenged claims. Paper 28, 9.

Patent Owner correctly notes that Henkin's Figure 2 depicts nozzle 90 oriented at an acute angle to the surface over which Henkin's apparatus moves. *Id.* at 8. Further, as depicted in Henkin's Figure 2, water ejected from nozzle 90 would produce a resultant force directed ahead of, rather than beneath, Henkin's apparatus. *Id.* at 8. Nevertheless, Henkin teaches that nozzle 90 is adjustable. Paper 44, 6 (quoting Ex. 1002, col. 5, ll. 15–16 (describing set means for holding nozzle 90 at a selected angle)). Moreover, Henkin teaches that “[t]he angle or the nozzle 90 is selected to yield both a downward thrust component (i.e. normal to the vessel surface) for providing traction and a forward component which aids in propelling the car and facilitates the car climbing vertical surfaces and working itself out of corners.” Ex. 1002, col. 5, ll. 19–23; *see* Paper 5, 55 (claim chart for Claim 21). Thus, Henkin teaches that the angle of nozzle 90 may be adjusted and that, if an appropriate angle was selected, such an adjustment could result in a resultant force vector directed *beneath* Henkin's apparatus. Paper 70, 15:17–19; 36:6–37:19. Further, Myers depicts that a resultant force vector produced by a water jet directed *beneath* Myer's apparatus. Paper 5, 55; Paper 70, 15:11–16.

Patent Owner also contends that “neither Henkin nor Myers, provide[s] a person of ordinary skill in the art with any purpose or reason to direct the ‘discharge filtered water forming a water jet having a resultant force vector acutely angled towards the surface beneath the apparatus,’ as required by challenged claim 21.” Paper 28, 9 (citation omitted). As

discussed above, Myers depicts that a resultant force vector produced by a water jet may be directed beneath Myer's apparatus. Paper 42, 8; Paper 5, 55. Petitioner argues that:

[b]oth Myers and Henkin teach propelling a cleaner using a water jet force. Accordingly, one of ordinary skill in the art would be motivated to combine the direction of the resultant force vector of Myers which provides stability with the Henkin cleaner to further increase the downward thrust component for providing traction in the Henkin cleaner in order to further increase the stability of the Henkin cleaner.

Paper 44, 8 (citations omitted). Further, as noted above, Henkin describes using the downward resultant force for a substantially similar purpose to the '183 Patent. Paper 70, 15:20–16:2; *compare* Ex. 1006, col. 10, ll. 60–64, *with* Ex. 1002, col. 5, ll. 19–23. As the U.S. Supreme Court has explained,

When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under § 103.

KSR, 550 U.S. at 421. We agree with Petitioner that Henkin provides a reason for combining its teachings with those of Myers and that the combination of the teachings of Henkin and Myers was “neither unpredictable nor beyond the person of ordinary skill.” *See* Paper 70, 16:22–24.

3. *Pansini and Myers*

Petitioner argues that Pansini discloses substantially all of the limitations of challenged claims 1–9 and 19–21, except that Pansini

discloses the use of an external pump, rather than an internal pump. *See* Paper 5, 16 (Claim 1), 49 (Claim 20), 55–56 (Claim 21). Like Myers, Pansini discloses an apparatus for cleaning submerged surfaces of a pool. Pansini, Abstract. Myers, however, teaches the use of an internal pump, e.g., ordinary rotary pump 23. Paper 5, 16. Petitioner argues that a person of ordinary skill in the relevant art would have had a reason to modify the teachings of Pansini to replace the external pump with an internally-mounted pump to eliminate (1) the need for an external source of pressurized water and supply hose, and (2) the need to manage the supply hose to prevent entanglement. *Id.* We agree.

Patent Owner contends that (1) Pansini does not teach that the angle of its jet nozzles 20 and 22, as depicted in Pansini’s Figure 3, creates a resultant force vector directed *beneath* the cleaning apparatus (Paper 28, 10); (2) Pansini does not teach that the water pump is mounted in the interior of the housing (*id.* at 12); and (3) the combination of Pansini and Myers fails to teach these missing limitations of Pansini (*id.* at 14). For the reasons set forth below, we are not persuaded by Patent Owner’s contentions.

First, Patent Owner contends that Pansini does not disclose that the angle of its jet nozzles 20 and 22, as depicted in Pansini’s Figure 3, creates a resultant force vector directed beneath the cleaning apparatus. *Id.* at 10. Although Patent Owner is correct, Petitioner relies on Myers, rather than Pansini, to teach this particular limitation of claim 21. Petitioner argues that, although “Pansini by itself does not disclose a resultant force vector directed beneath the apparatus, Myers does disclose such a force vector, and Patent Owner does not dispute this fact.” Paper 44, 9. As Patent Owner acknowledges, Myers teaches a resultant force vector having a horizontal

component and a vertical component and that “Myers only generally discloses that ‘the outlet of said pump [is] capable of serving to jet a stream of water for propelling said chassis over the floor of a swimming pool.’” Paper 28, 11 (quoting Ex. 1001, col. 7, ll. 46–48). The horizontal component may assist in propelling the apparatus, and the vertical component may assist in maintaining the apparatus in contact with the surface beneath it. *Id.* Patent Owner contends, however, that “[t]hese were not attributes even considered by Pansini or Myers.” *Id.* (citing Ex. 2016 ¶ 72). Therefore, Patent Owner contends that a person of ordinary skill in the art would not have combined the teachings of Pansini and Myers to achieve this limitation. *Id.* at 14.

Petitioner disagrees and argues that

[O]ne of ordinary skill in the art would be motivated to combine the direction of the resultant force vector of Myers (directed at the surface beneath the cleaner) which provides stability with the Pansini cleaner to further increase the hold-down force of the Pansini cleaner to further increase the stability of the Pansini cleaner.

Paper 44, 9; *see* Ex. 1010 ¶ 22 (citing Ex. 1003, col. 3, l. 66–col. 4, l. 2); Paper 70, 17:1–8, 52:23–53:9. As we noted above, the U.S. Supreme Court has explained, that “[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.” *KSR*, 550 U.S. at 421. Therefore, we are persuaded that Petitioner demonstrates that the combined teachings of Pansini and Myers teach a resultant vector force that may be angled beneath the apparatus, and that a person of ordinary skill in the art would

have reason to combine their teachings to achieve this limitation.

Second, Patent Owner argues that Pansini does not teach that the water pump is mounted in the interior of the housing, and that a person of ordinary skill in the relevant art would be discouraged from combining the teachings of Pansini and Myers to achieve that configuration. Paper 28, 12. In particular, Patent Owner argues that “Pansini was principally concerned with the fact that a cleaning apparatus fed by the pool’s circulation system would be highly susceptible to being tipped over by the drag force of the hose which provided the water source to propel the cleaning device.” *Id.* In support of this argument, Patent Owner cites a claim that was cancelled during Pansini’s prosecution, reciting that “said hose applying a drag force to said carrier tending to tip it over in a direction opposite to its direction of movement under the influence of the drive jet from said nozzle.” Ex. 2013, 25 (quoting cancelled claim 19). From this portion of the prosecution history, Patent Owner argues that “Pansini’s invention related to solving the problem of using an external pump, not eliminating it.” Paper 28, 12 (citing Ex. 2016 ¶ 70). We are not persuaded by Patent Owner’s arguments.

As noted in our Decision to institute *inter partes* review, we were not persuaded that Pansini’s teachings would discourage persons of ordinary skill in the relevant art from incorporating a pump within the housing of the cleaner described in Pansini. Paper 18, 24–25. The evidence presented in Patent Owner’s response to the petition does not now persuade us otherwise. *See* Paper 28, 12–14. Although Pansini may have been concerned that “a cleaning apparatus *fed by the pool’s circulation system* would be highly susceptible to being tipped over by the drag force of the hose which provided the water source to propel the cleaning device” (*id.* at 12 (emphasis

added)), Patent Owner fails to demonstrate that Pansini's teachings are limited to such cleaner configurations. Further, although Pansini's cancelled application claim 19 recited that "said hose applying a drag force to said carrier tending to tip it over in a direction opposite to its direction of movement under the influence of the drive jet from said nozzle" (Ex. 2013, 25 (quoting cancelled claim 19)), Patent Owner does not demonstrate that Pansini's teachings are so limited. *See id.* at 13; *see also* Paper 44, 8–9 (describing Pansini's claim 1).

Finally, Patent Owner notes the purported dangers of using electrically powered pool cleaners as a reason against combining the teachings of Pansini and Myers as proposed by Petitioner. Paper 28, 14 (citing Ex. 2016 ¶¶ 19 ("In 1999, these companies (including Polaris, now owned by Zodiac) criticized and described electrically powered robotic pool cleaners as being dangerous because of the use of electrically powered components in water."), 69, 72 (describing problems with cable entanglement)). As we noted in our Decision to institute *inter partes* review, the apparatus recited in the independent claims is not limited to use in swimming pools, but also is suitable for use in tanks. Paper 18, 24; *see* Ex. 1006, col. 26, ll. 25-26 (Claim 21) ("for cleaning a submerged surface of a pool *or tank*" (emphasis added)).

In addition, although the Specification of the '183 Patent may describe embodiments of the internal pump including electric motors, claim 21 merely recites a "water pump" and does not require that the recited pump be driven by an electric motor. *See* Paper 18, 25. Similarly, we addressed the issue of power supply cable entanglement in our Decision to institute and suggested that, for example, the use of a battery might resolve this issue. *Id.*

at 26. Although Patent Owner's declarant states that the use of a battery may have been undesirable and may have caused other difficulties, the declarant does not state that this option was unavailable. *See* Ex. 2016 ¶ 20. Therefore, we are not persuaded that Pansini teaches away from the Petitioner's proposed combination of Pansini and Myers, nor do we find that Pansini's teachings are limited the use of external or internal pumps.

4. *Secondary Considerations*

Factual inquiries for an obviousness determination include secondary considerations based on evaluation and crediting of objective evidence of nonobviousness. *Graham*, 383 U.S. at 17. Notwithstanding what the teachings of the prior art would have suggested to one with ordinary skill in the art at the time of the '183 Patent's invention, the totality of the evidence submitted, including objective evidence of nonobviousness, may lead to a conclusion that the challenged claims would not have been obvious to one with ordinary skill in the art. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984). Secondary considerations may include any of the following: long-felt but unsolved needs, failure of others, unexpected results, commercial success, copying, licensing, and praise. *See Graham*, 383 U.S. at 17; *Leapfrog Enters., Inc. v. Fisher–Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007).

To be of relevance, evidence of nonobviousness must be commensurate in scope with the claimed invention. *In re Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011) (citing *In re Tiffin*, 448 F.2d 791, 792 (CCPA 1971)); *In re Hiniker Co.*, 150 F.3d 1362, 1369 (Fed. Cir. 1998). In that regard, in order to be accorded substantial weight, there must be a nexus between the merits of the claimed invention and the evidence of secondary

considerations. *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995). “Nexus” is a legally and factually sufficient connection between the objective evidence and the claimed invention, such that the objective evidence should be considered in determining nonobviousness. *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988). The burden of showing that there is a nexus lies with the patent owner. *Id.*; see *Paulsen*, 30 F.3d at 1482.

a. Long-Felt Need

Here, Patent Owner argues that, prior to 1999, there was a long-felt need to provide efficient, automated cleaning devices, as recited in the challenged claims. Paper 28, 15-19. In particular, Patent Owner contends that three approaches were developed separately at the time of the invention and that the third approach was embodied in the claims of the ’183 Patent, namely, “a truly robotic cleaner driven by electrical power *that requires controlled movements.*” *Id.* at 15-16 (citing Ex. 2016 ¶ 22) (emphasis added). Consequently, Patent Owner argues that, because of the long-felt need for its products embodying the claimed invention, the subject matter of the challenged claims would not have been obvious over the combination of Henkin and Myers or Pansini and Myers. *Id.* at 17. As support, Patent Owner proffers the declaration of Mr. Erlich (Ex. 2016), who is an inventor of the ’183 Patent. *Id.* at 3, 15–19.

Patent Owner argues that “[c]ontrolling the movement of the cleaner was critical to avoiding the twisting of the electric cable which would seriously impede the cleaner’s operation.” *Id.* at 17 (citing Ex. 2016 ¶ 28). Petitioner responds that “Patent Owner’s argument is flawed because the purported ‘solution’ to the alleged ‘long felt need’ is not claimed, as Claim

21 does not require or even describe controlled movement or surface stability.” Paper 44, 9. Similarly, Patent Owner fails to demonstrate that the recitations of the challenged claims solve the other problems which Patent Owner contends are the subject of long-felt need, namely, susceptibility of parts to wear and breakdown and elimination of power supply cables. Paper 28, 16–19; *see* Paper 44, 10–11. Consequently, to the extent that Patent Owner may have shown that these problems represent a long-felt need, Patent Owner fails to show a nexus between that need and limitations recited in the challenged claims of the ’183 Patent. Paper 28, 13–14. Thus, we determine that Patent Owner’s objective evidence does not support a conclusion of nonobviousness, because the evidence before us does not demonstrate adequately that the challenged claims represent a solution to the alleged long-felt need.⁵

b. Failure of Others and Commercial Success

Patent Owner further argues that its products were commercially successful and that others had failed to develop corresponding products. Paper 28, 19–20. To substantiate its argument that Patent Owner’s products were commercially successful, Patent Owner states that

Customers responded [to the introduction of its products] by purchasing more than 100,000 units in the first ten years since introduction. Sales have increased every year since 2002.

⁵ Patent Owner further argues that our Decision to institute *inter partes* review “implicitly recognized that the prior art did not anticipate or render obvious this angular/vector force in deciding that claims 10–12 of the ’183 Patent are not subject to these proceedings.” Paper 28, 19. However, our Decision merely found that, by its arguments and supporting evidence, Petitioner had failed to establish a reasonable likelihood of prevailing in demonstrating the unpatentability of those claims over Exhibits 1001 and 1004. Paper 18, 31–33.

Within about four years from introduction annual sales of Pool Rover exceeded ten thousand units. Today, sales of jet drive products account for more than 2/3 of all Aqua Products' sales of pool cleaners.

Id. at 20 n.4 (citing Ex. 2016 ¶ 40). The cited portion of Mr. Erlich's declaration (Ex. 2016), however, identifies no evidence in support of these statements. Further, Patent Owner contends that Petitioner developed a product based on Patent Owner's product and that Petitioner's product also embodies the challenged claims. *Id.* at 20–21. Moreover, Patent Owner contends that, when Patent Owner's and Petitioner's products, which both allegedly embody the challenged claims, are considered together, the combined sales “represent by far the majority of sales in the United States of robotic pool cleaners.” *Id.* at 22. Patent Owner, however, points to no other evidence supporting these contentions.

In addition, as Petitioner correctly points out, “information solely on numbers of units sold is insufficient to establish commercial success.” Paper 44, 11 (citing *In re Baxter Travenol Labs*, 952 F.2d 388, 392 (Fed. Cir. 1991) (“Information solely on numbers of units sold is insufficient to establish commercial success.”)). Petitioner also correctly notes that “Patent Owner makes no showing that these alleged sales figures are significant in the pool cleaner industry.” *Id.* at 11–12 (citing *In re Huang*, 100 F.3d 135, 140 (Fed. Cir. 1996) (“Declining to find evidence of commercial success because ‘[a]though [the inventor’s] affidavit certainly indicates that many units have been sold, it provides no indication of whether this represents a substantial quantity in this market.’”). Accordingly, we find unpersuasive Patent Owner's proffered evidence of commercial success. *See Cable Elec. Prods., Inc. v. Genmark, Inc.*, 770 F.2d 1015, 1026–27 (Fed. Cir. 1985)

(finding that sales of five (5) million units represent a minimal showing of commercial success because “[w]ithout further economic evidence . . . it would be improper to infer that the reported sales represent a substantial share of any definable market”).

Patent Owner also argues that “failure of others” was evidence of secondary considerations, which may lead to a conclusion that the challenged claims would not have been obvious to one with ordinary skill in the art. Paper 28, 19. Patent Owner presents insufficient evidence for us to determine whether others had attempted and failed in developing the subject matter of the challenged claims. Other than perhaps Petitioner’s failure to develop the subject matter of the challenged claims before Patent Owner,⁶ as Petitioner notes, “no failure of any other company’s pool cleaners is discussed in the section.” Paper 44, 15. Further, “Patent Owner does not describe any other company’s attempt to produce a cleaner that would infringe Claim 21, nor does Patent Owner describe how any other company failed in their ‘attempts.’” *Id.*

In its Sur-Reply in support of its response, Patent Owner alters it asserted secondary considerations from the failure of others to copying. Paper 56, 1. Nevertheless, Petitioner previously asserted that it began development of its own product over a year before meeting with Patent Owner to discuss working together. Paper 44, 14 (citing Ex. 2016 ¶¶ 23, 24). In its Sur-Reply, Patent Owner only asserts that “[t]he adoption of Jet

⁶ Patent Owner asserts that, prior to being informed of Patent Owner’s products specifications, “[Petitioner’s] representatives acknowledged that they had not previously contemplated a commercial product incorporating controlled movement jet drive.” Paper 28, 20.

Drive by Zodiac *is consistent with* copying after Zodiac saw Aqua Products' Jet Drive, assessed consumer preferences and confirmed the pump flow design." Paper 56, 4 (emphasis added). We do not determine infringement in *inter partes* review, and the evidence presented by Patent Owner is insufficient to show that Petitioner copied Patent Owner's products.

After weighing the evidence of obviousness and nonobviousness of record, on balance, we conclude that the strong evidence of obviousness outweighs the weak evidence of nonobviousness.

Therefore, in view of the foregoing discussion of claim 21 and accepting Patent Owner's definition of a person of ordinary skill in the relevant art (Ex. 2016 ¶ 17), we are persuaded that Petitioner has demonstrated by a preponderance of the evidence that claims 1–5 and 19–21 of the '183 Patent are unpatentable over Henkin and Myers and that claims 1–9 and 19–21 of the '183 Patent are unpatentable over Pansini and Myers.

C. Motion to Amend Claims

As noted above, Patent Owner filed a contingent, Replacement Corrected Motion to Amend Claims under 37 C.F.R. § 42.121. Paper 42. Petitioner filed an Opposition to Patent Owner's Replacement Corrected Motion to Amend Claims (Paper 45), and Patent Owner filed a Corrected Reply in Support of Motion to Amend Claims (Paper 55). Because we conclude that Petitioner has shown the challenged claims to be unpatentable, we now consider the Replacement Corrected Motion to Amend Claims.

1. Scope of Motion to Amend Claims

Pursuant to 37 C.F.R. § 42.121(a)(2), a motion to amend claims may be denied if: (1) the amendments "seek[] to enlarge the scope of the claims

of the patent”; (2) the amendments “introduce new subject matter”; or (3) the amendments do not “respond to a ground of unpatentability,” upon which trial was instituted. As discussed below, we determine that substitute claims 22 and 24 presented in Patent Owner’s Replacement Corrected Motion to Amend Claims are definite and narrow the scope of the original claims, and do not introduce new subject matter. Although Patent Owner’s Replacement Corrected Motion to Amend Claims attempts to respond to grounds of unpatentability, upon which trial was instituted, for the reasons set forth below, we deny Patent Owner’s Replacement Corrected Motion to Amend Claims.

a. Narrowing Amendments

In substitute claim 22, Patent Owner proposes to replace the phrase “to *enable* movement of said apparatus” in claim 1 with the phrase “to *control* the directional movement of the apparatus.” Paper 42, 1 (emphasis added). Petitioner argues that replacing “enable” with “control” impermissibly broadens claim 22. Paper 45, 4. In particular, Petitioner argues that “[e]nable’ has a well-known ordinary and customary meaning of ‘to provide with the means or opportunity’ and ‘to make possible, practical, or easy.’ In contrast, ‘control’ has a well-known ordinary and customary meaning of ‘to exercise restraining or directing influence over.’” *Id.* at 4–5 (citations omitted). Thus, Petitioner contends that enable and control have different meanings and that the meaning of “control” is not contained within the meaning of “enable.” *Id.* at 5. Patent Owner responds that “[e]nable’ subsumes both controlled or uncontrolled enabled movement. ‘Control’ restricts that which is ‘enabled.’” Paper 55, 2.

We are not persuaded that the term “enable” *subsumes* the term “control.” Although, as both parties acknowledge, to “enable” may mean “to make possible, practical or easy,” (*see* Paper 55, 2 (citing Paper 45, 4)), this definition does not imply the power to control. Nevertheless, we are persuaded that, in order to “control” movement, movement first must be “enabled” or that the term “control” *subsumes* the term “enable.” Thus, within the context of this substitute claim and as suggested by Petitioner, we construe the phrase “to control the directional movement” as “to *enable and control* the directional movement.” *See* Paper 55, 4. As such, we conclude that this proposed amendment to substitute is narrowing.

In substitute claims 23 and 24, Patent Owner further proposes to amend each claims 8 and 20, respectively, to recite that “said predetermined angle is inclined upwardly with respect to the surface beneath the apparatus to produce a resultant force vector that is directed to a position that is proximate to and rearwardly displaced from a line passing through the transverse axial mountings of the front rotationally-mounted supports [or of the front pair of wheels].” Paper 42, 3, 4–5. We find this limitation narrows each of these substitute claims by requiring a narrower range of acute angles for the discharge conduit, such that the resultant force vector not only is directed to the surface beneath the apparatus, but to a specific area with respect to the recited transverse axial mountings.

Petitioner contends that, because substitute claim 23 recites that “a resultant force vector ‘is directed to pass proximately to and rearwardly of the plane of the axis of rotation of the pair of wheels at the front portion of the apparatus,’ rather than ‘through’ the plane, as recited in original claim 8,” the substitute claim fails to narrow the original claim that it would

replace. Paper 45, 6. In particular, Petitioner contends that, in order to narrow the original claim, the substitute claim must recite that the resultant force vector “is directed to pass *through and* proximately to and rearwardly of the plane of the axis of rotation of the pair of wheels at the front portion of the apparatus.” *Id.* (emphasis added). Patent Owner argues that Petitioner’s contention ignores the dependency of substitute claim 23, from substitute claim 22. Paper 55, 4. We agree with Patent Owner’s argument. Because we determine that substitute claim 22 properly narrows the subject matter of original claim 1, we are persuaded that substitute claim 23 also properly narrows the subject matter of original claim 8.

Patent Owner contends that the remaining limitations added to substitute claims 22–24 are narrowing limitations. Paper 55, 1. Petitioner does not contest that the remaining limitations are narrowing. Paper 45, 4–7. We agree that the remaining limitations are narrowing. Therefore, for the foregoing reasons, we determine that Patent Owner’s proposed substitute claims 22–24 comply with 37 C.F.R. § 42.121(a)(2).

b. Definiteness of Substitute Claims

Under 35 U.S.C. § 112, ¶ 2, “[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.” The U.S. Supreme Court read “§ 112, ¶ 2 to require that a patent’s claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus, Inc. v. BioSig Instruments, Inc.*, 134 S.Ct. 2120, 2129 (2014). We apply this standard in the context of our use of the broadest reasonable interpretation standard for claim construction (37 C.F.R. § 42.100(b)) and, given that the

challenged claim terms were introduced in a motion to amend claims, in the absence of prosecution history with respect to the language of the proposed substitute claims.⁷ Petitioner argues that the substitute claims are indefinite. Paper 45, 7–9. We disagree.

Petitioner contends that, because substitute claim 24 only refers to “at least a front pair of wheels, each wheel axially mounted transverse to the longitudinal axis” of said apparatus, this claim fails to provide proper antecedent basis in the claim for the term “*the* transverse axial mountings.” *Id.* at 7 (emphasis added). Claim 22 similarly recites that “rotationally-mounted supports [are] axially mounted transverse to a longitudinal axis of said apparatus.” In particular, Petitioner contends that “[i]t is unclear from the claim what is meant by the term ‘transverse axial mountings’ (i.e., whether the mountings are part of, connected to, or entirely separate from supports or wheels).” *Id.* Petitioner, however, confuses the requirement for antecedent basis with the construction of the term. Here, we are persuaded that the description of the supports or wheels as “axially mounted transverse to a longitudinal axis” provides sufficient antecedent basis for the later reference to “the transverse axial mountings.” *See* Paper 55, 3.

Petitioner further contends that, because substitute claims 22 and 24 refer to “a longitudinal axis” and because the term “longitudinal axis” is undefined, these claims are indefinite. Paper 45, 8 (citation omitted). In particular, Petitioner contends that “it is unclear *when* the supports of claim

⁷ *See In re Packard*, 751 F.3d 1307, 1325 (Fed. Cir. 2014) (Plager, J., concurring) (“[U]nlike courts which have a full prosecution record to consider, the prosecution record before the USPTO is in development and not fixed during examination, and the USPTO does not rely on it for interpreting claims.”).

22 or the wheels of claim 24 are transverse to the longitudinal axis.” *Id.* (emphasis added). Patent Owner argues that the “longitudinal axis” is described in the Specification. Paper 55, 3 (citing, e.g., Ex. 1006, Figs. 33–36 (depicting double headed arrow)); *see also* Ex. 1006, col. 4, ll. 8–11 (the cleaner may move “on supporting wheels, rollers or tracks that are aligned *with the longitudinal axis* of the cleaner body when it moves in a straight line” (emphasis added)). Further, as Patent Owner correctly notes, the supports (claim 22) or the wheels (claim 24) are axially mounted transverse to the longitudinal axis, but the supports or wheels themselves are not recited as “transverse to the longitudinal axis.” Paper 55 3–4; *see* Paper 45, 8. Thus, substitute claims 22 and 24 are not indefinite for the reasons proposed by Petitioner.

Petitioner contends that substitute claim 23 is indefinite (1) because the claim recites “a force vector” and it is not clear whether this is the same as or a different “force vector” from that recited in its base claim, claim 22; and (2) because the claim recites “the plane” without providing antecedent basis for the “plane.” Paper 45, 8–9. In particular, Petitioner contends that “many force vectors can potentially be ‘directed to pass proximately to and rearwardly of the plane.’” *Id.* at 9 (citing Ex. 1010 ¶ 26). As with original claims 7 and 8, we construe the term “a force vector” of substitute claim 23 to refer to the force vector in its base claim. With respect to the recitation of “the plane,” there are only a limited number of planes which may contain the transverse axial mounting and be oriented, such that the force vector is directed to pass “proximately to and rearwardly of the plane.” In particular, the plane may be parallel to the direction of the vector, but if the plane is angled toward the vector, the degree of offset is limited by the length, i.e.,

the magnitude, of the resultant force vector. Thus, Patent Owner's claim may be broad in scope, but the breadth of a claim is not to be equated with indefiniteness. *See e.g., In re Miller*, 441 F.2d 689, 693 (CCPA 1971). Thus, substitute claim 23 is not indefinite for the reasons proposed by Petitioner.

c. Written Description for Substitute Claims

37 C.F.R. § 42.121(b)(1) requires the patent owner to set forth in a motion to amend "the support in the original disclosure of the patent for each claim that is added or amended." *See Nichia Corporation v. Emcore Corporation*, IPR2012-00005, slip op. 3 (PTAB June 3, 2013) (Paper 27). Substitute claim 23 recites that "a resultant force vector in the water jet discharged from said at least one discharge opening that is directed to pass proximately to and rearwardly of the plane of the axis of rotation of the pair of wheels at the front portion of the apparatus." Paper 42, 3. Petitioner contends that "Patent Owner has failed to identify where this language is recited *in haec verba* and further failed to explain why one of ordinary skill in the art would have recognized that the inventor possessed the claimed subject matter." Paper 45, 10. As the U.S. Court of Appeals for the Federal Circuit explains, however,

The test for determining compliance with the written description requirement is whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter, *rather than the presence or absence of literal support in the specification for the claim language . . .* The content of the drawings may also be considered in determining compliance with the written description requirement.

In re Kaslow, 707 F.2d 1366, 1375 (Fed. Cir. 1983) (emphasis added) (citations omitted). Consequently, Patent Owner is not required to identify where this language is recited *in haec verba* in order to satisfy the written description requirement.

Patent Owner argues that the recitations of substitute claim 23 conforms the language of that claim to the language proposed in substitute claim 22. Paper 45, 6–7. We agree. Substitute claim 22 recites that “a resultant force vector that is directed to *a position that is proximate to and rearwardly displaced from a line passing through the transverse axial mountings* of the front rotationally-mounted supports.” Paper 42, 3 (emphasis added). Original claims 7 and 8 described the rotationally-mounted supports as a pair of wheels and the resultant force vector as passing *through* the plane of the axis of rotation of the pair of wheels. Ex. 1006, col. 24, ll. 52–63. Further, the orientation of the plane of the axis of rotation of the pair of wheels is implicit in the drawings, given the angle of the resultant force vector. *E.g., id.* Fig. 9; *see Enzo Biochem, Inc. v. Gen-Probe Inc.*, 323 F.3d 956, 969 (Fed. Cir. 2002) (“the written description requirement is satisfied by the patentee’s disclosure of ‘such descriptive means as words, structures, figures, diagrams, formulas, etc., that fully set forth the claimed invention.’” (citation omitted)). Therefore, we determine that substitute claim 23 satisfies the written description requirement.

2. Patentability Over the Prior Art

An *inter partes* review is neither a patent examination proceeding nor a patent reexamination proceeding. In a motion to amend claims, the patent owner, as the movant, bears the burden of establishing the patentability of the proposed substitute claims over the prior art of record and also other

prior art known to Patent Owner. *Idle Free Systems, Inc. Bergstrom, Inc.*, IPR2012-00027, slip op. 7 (PTAB June 11, 2013) (Paper 26) (informative). We deny the Replacement Corrected Motion to Amend Claims because, for the reasons below, we are not persuaded that Patent Owner has demonstrated the patentability of the proposed substitute claims over a ground of unpatentability involving Henkin and Myers.

a. Construction of Substitute Claims

Initially, we note that Patent Owner does not propose a construction for the claim terms added to original claims 1, 8, and 20 by substitute claims 22–24, respectively. Paper 55, 4–5. Patent Owner again addresses the definition of “a front portion” and “a forward direction” in the substitute claims and asserts that “[t]he proposed amendments require that the ‘front’ is not variable.” *Id.* at 4. We disagree.

As with original claim 1, substitute claim 22 continues to define the “front portion as defined by the direction of movement of the apparatus when propelled by a water jet.” Paper 42, 2. Claim 24 adopts a similar recitation from original claim 20. *Id.* at 4. Consequently, we again construe the front portion as variable with the direction of movement “when propelled by a water jet.”

Substitute claim 22 recites that rotationally-mounted supports are “axially mounted transverse to a longitudinal axis of said apparatus.”⁸ *Id.* at 2. Substitute claim 24 recites a similar limitation in which the supports are pairs of wheels. *Id.* at 4. Patent Owner proposes that we construe longitudinal axis as an axis which extends along the length of the apparatus

⁸ Substitute claim 23 depends from substitute claim 22 and recites that the supports are pairs of wheels. Paper 42, 3.

in the direction of movement. Paper 55, 3-4. Patent Owner also proposes that “the ‘longitudinal axis’ is a real or imaginary straight line running or placed lengthwise around which the parts of the apparatus are symmetrically arranged.” Paper 55, 3. Because the apparatus may move in any direction (*see* Ex. 1006, col. 5, ll. 4–9 (apparatus with “controlled random motions with respect to the bottom surface of the pool or tank”)), this construction means that the orientation of the longitudinal axis is variable. Petitioner does not contest this construction (*see* Paper 45, 8), and we adopt this construction of the term “longitudinal axis.”

Patent Owner does not propose a construction for “transverse axial mountings.” Nevertheless, Patent Owner proposes that

A line defined as extending transversely between the transverse axial mountings of the front pair of wheels is present either for wheels that have a common axle 32 which extends transversely across the longitudinal axis of the cleaning apparatus (’183 Patent, Figs. 9, 10) or are individually mounted to an independent axle that does not extend completely across the cleaning apparatus. *Id.*, Figs. 33–36, 39–44.

Paper 42, 6. A relevant definition of “transverse” is “lying, situated, placed, etc. across; crossing from side to side; opposed to LONGITUDINAL.” WEBSTER’S NEW WORLD DICTIONARY (Ex. 3002) at 1422. Petitioner does not propose a construction for this term. Therefore, we construe the term “transverse axial mountings” as devices for mounting rotationally-mounted supports or wheels on opposite sides of a longitudinal axis. Because both the front portion and the longitudinal axis may vary with the direction of movement, a transverse line across the longitudinal axis or between supports or wheels also may vary with the direction of movement.

Further, substitute claim 22 recites that “rotationally-mounted supports axially mounted transverse to a longitudinal axis of said apparatus and coupled proximate the front and rear portions of the housing *to control* the directional movement of said apparatus over the submerged surface.” Paper 42, 2 (emphasis added). Thus, substitute claim 22 recites that the supports *control* the directional movement although the apparatus may be *propelled* by a water jet. Substitute claim 24 recites that such control is supplied by wheels, rather than supports.

Although each of substitute claims 22–24 recites that the apparatus comprises “a stationary directional discharge conduit,” this limitation appears in original claim 1. We construe this limitation in the same manner that we construed it with respect to the original claims. *See supra* Section II.A.1. Consequently, we remain unpersuaded that the front portion is not variable, e.g., is in constant alignment with the water jet which is propelling the apparatus in a forward direction. *See* Paper 28, 5.

Finally, substitute claim 22 recites that “said predetermined angle is inclined upwardly with respect to the surface beneath the apparatus to produce a resultant force vector that is directed to a position that is proximate to and rearwardly displaced from a line passing through the transverse axial mountings of the front rotationally-mounted supports.” Paper 42, 2. Substitute claim 24 recites a similar limitation referring to pairs of wheels, instead of supports. *Id.* at 4–5. Consistent with the constructions set forth above, we construe the line passing through the transverse axial mountings as varying with the direction of movement. Hence, as the apparatus changes direction, each of the front portion, the longitudinal axis,

and the line passing through the transverse axial mountings “of the *front* rotationally-mounted supports” will vary.

b. Obviousness over Henkin and Myers

Patent Owner argues that substitute claims 22–24 are patentable over Henkin and Myers. Paper 42, 11–13. In particular, Patent Owner argues that “[n]either Henkin nor Myers suggest an apparatus with the ‘resultant force vector that is directed to a position that is proximate to and rearwardly displaced from a line passing through the transverse axial mountings of the front rotationally-mounted supports’ (claim 22) or the ‘front pair of wheels’ (claim 24).” Paper 42, 11–12 (citing Ex. 2016 ¶ 77) (emphasis omitted).

Patent Owner argues that the Specification of the ’183 Patent discloses that the resultant force vector enables the apparatus to maintain consistent traction with the pool surface, advances the cleaner in a forward direction, and allows the apparatus to maintain proper orientation when contacting a vertical wall that is normal to the horizontal bottom surface beneath the cleaner. Paper 42, 12 (citing Ex. 1006, col. 10, l. 60–col. 11, l. 3; col. 10, ll. 47–51; col. 25, ll. 10–13; Ex. 2016 ¶ 78). In particular, Patent Owner argues that:

When the apparatus comes into contact with a vertical surface normal to the horizontal bottom surface, the angle and direction, i.e., positioning of the resultant force vector V_r , ensures that the apparatus does not flip up and disrupt the cleaning pattern. Paper 42, 12 (citing Ex. 2016 ¶ 78). If the resultant force vector is directed forward of the transverse axial line of the front rotationally-mounted supports, the rear end of the apparatus can be impelled to flip upwards and rotate forward towards the vertical sidewall, thereby displacing and hindering the forward ascent of the apparatus up the sidewall. *Id.* ¶¶ 36, 79.

Paper 42, 12.

As Petitioner notes, “Henkin discloses a resultant force vector having th[e] very same purpose” that Patent Owner attributes to the structure of the substitute claims. Paper 45, 13. Patent Owner states that “[t]he angle [of adjustable nozzle 90] is selected to yield both a downward thrust component, *i.e.*, normal to the vessel surface, for providing traction and a forward component which aids in propelling the apparatus. Set means can be provided for holding the selected angle of the nozzle and valve means for varying the flow rate through the nozzle, 90.” Paper 28, 8 (citing Ex. 2016 ¶ 64 (citing Ex. 1002, col. 5, ll. 15–27)). Henkin specifically teaches that the selected angle of nozzle 90 also “facilitates the car *climbing vertical surfaces* and working itself out of corners.” Ex. 1002, col. 5, ll. 22–24 (emphasis added).

Patent Owner argues Henkin and Myers did not recognize or try to solve the problem it identified. Paper 42, 13 (citing Ex. 2016 ¶ 80). Patent Owner argues that “[n]either Henkin nor Myers suggest or otherwise provide a person of ordinary skill in the art with any reason to direct the resultant force vector proximate to and rearwardly displaced from a line passing through the transverse axial mountings of the front rotationally-mounted supports (e.g., a front pair of wheels), as recited in proposed substitute claim 22 or 24.” Paper 42, 12–13 (citing Ex. 2016 ¶¶ 63, 79). As discussed above with respect to the original claims, we disagree. Henkin describes using the downward resultant force for a substantially similar purpose to the ’183 Patent. Paper 70, 15:20–16:2; *compare* Ex. 1006, col. 10, ll. 60–64, *with* Ex. 1002, col. 5, ll. 19–23. Consequently, we find that with respect to the additional limitations recited in the substitute claims, there are a finite

number of predictable solutions and that the subject matter of the substitute claims is not the product of innovation, but of ordinary skill and common sense. *See KSR*, 550 U.S. at 421; *see also* Paper 70, 16:22–24 (“The patent owner has not put forward any reason that this particular technology area is so specialized that [the combinations of the teachings of Henkin and Myers] were neither predictable or beyond the person of ordinary skill.”).

Consequently, Patent Owner’s Replacement Corrected Motion to Amend Claims requesting entry of substitute claims 22–24 is *denied* for failing to demonstrate that the substitute claims are patentable over Henkin and Myers.⁹

D. Motion to Exclude Evidence

In Patent Owner’s Motion to Exclude Evidence, Patent Owner moves to exclude (1) certain paragraphs of the declaration of Petitioner’s declarant, Mr. McQueen (*i.e.*, Ex. 1009 ¶¶ 16–21, 23, 26); and (2) the declaration of Petitioner’s declarant, Dr. Homayoon Kazerooni (Ex. 1010). Paper 58, 1. As noted above, Petitioner filed an Opposition to Patent Owner’s Motion to Exclude Evidence (Paper 61), and Patent Owner filed a Reply Memorandum in Support of its Motion to Exclude Evidence (Paper 62). The motion is *granted-in-part* and *denied-in-part*.

⁹ Petitioner notes that “Patent Owner did not identify or assert any secondary considerations of non-obviousness with respect to substitute claims 22-24.” Paper 45, 15. Nevertheless, we were not persuaded by Patent Owner’s arguments regarding secondary considerations with respect to the challenged claims.

1. Declaration of Mr. McQueen

With regard to the Declaration of Mr. McQueen, Patent Owner requests that we exclude (1) paragraphs 23 and 26 because these paragraphs rely on information that was not produced or for which English-language translations were not provided; (2) paragraphs 16–18 because these paragraphs rely on information concerning meetings which Mr. McQueen did not attend; and (3) paragraphs 19–21 because these paragraphs respond to Mr. Erlich’s comments concerning a meeting (Ex. 2016 ¶ 49) that Mr. McQueen did not attend. Paper 58, 3–8. Regarding the Declaration of McQueen, Petitioner contends that Patent Owner’s objections were insufficient or untimely. Paper 61, 2–3. In addition, regarding paragraph 26, Petitioner contends that Mr. McQueen’s statements concerning certain unproduced user-studies relate to his recollection of the studies, rather than the studies themselves. *Id.* at 4. Further, Petitioner acknowledges that it could not locate and produce the studies. *Id.* at 5. Petitioner maintains, however, that Mr. McQueen’s testimony is admissible without the supporting documents. *Id.* (citing F.R.E. 602).

Patent Owner states that it first objected to the Declaration of Mr. McQueen on March 16, 2014, four business days after service of the declaration. Paper 58, 3; Paper 62, 1. Further, Petitioner’s production and filing of documents in this case was piecemeal and ultimately incomplete. *See* Paper 61, 5; Paper 62, 1–2. Given the Petitioner’s actions in this case, we determine that Petitioner was adequately and timely informed of Patent Owner’s objections to the Declaration of Mr. McQueen. *See* 37 C.F.R. § 42.5(a).

With respect to paragraph 26 of the Declaration of Mr. McQueen, we determine that Patent Owner's objections go to the weight that we accord to Mr. McQueen's testimony, rather than the admissibility of this paragraph of the Declaration of Mr. McQueen. We are capable of according the appropriate weight to testimony, for which Petitioner is unable to provide support. Therefore, we deny Patent Owner's request to exclude paragraph 26 of the Declaration of Mr. McQueen.

With respect to paragraph 23 of the Declaration of Mr. McQueen, Mr. McQueen refers to an engineering study, including a flow analysis, in the Spring and Summer of 2007 by a third party engineering company; three Enveloppe Soleau filed with the French National Industrial Property Institute on August 20, 2007; and nine French patent applications filed in December 2007. Ex. 1009 ¶ 23. Of these documents, Patent Owner states that only one of the three Enveloppe Soleau was produced (Ex. 1014B). Paper 58, 4. Nevertheless, this exhibit was not filed with the Board. Further, although Petitioner appears to have produced certain supporting documents (e.g., Exhibits 1014A, 1014B, 1015A, and 1015B) to Patent Owner, Patent Owner asserts that these documents were produced in French, without accompanying English-language translations. *Id.* at 5–6.

In acknowledgment of the deficiencies in its production of documents to the Patent Owner and in its filing of documents with the Board, Petitioner offers to strike portions of paragraph 23 of the Declaration of Mr. McQueen. Paper 61, 4–5. Petitioner's offer is insufficient. Petitioner's declarant states that "Zodiac had a third party engineering company *conduct an engineering study, including a flow analysis on the inverted pump design and engineering drawings.* This analysis took place in the spring and summer of

2007.” Ex. 1009 ¶ 23 (emphasis added). Contrary to Petitioner’s assertion, these sentences relate to the content of cited documents, rather than solely to “facts that occurred.” Paper 61, 5. Therefore, we grant-in-part Patent Owner’s motion to exclude paragraph 23 of the Declaration of Mr. McQueen and exclude all of paragraph 23 of Mr. McQueen’s declaration, except for the first sentence: “Zodiac’s development of the Polaris 9300/9400 line began in January 2007.” We accord the appropriate weight to this statement in the Declaration of Mr. McQueen.

With respect to paragraphs 16–21 of the Declaration of Mr. McQueen, Patent Owner objects that Mr. McQueen’s testimony is based on his general, rather than specific, knowledge of meetings and conversations, in which he was not a participant. Paper 58, 6–8; Paper 62, 3–4. Petitioner does not dispute that Mr. McQueen did not participate in these meetings or conversations. *See* Paper 61, 7–9. Further, Petitioner contends that “Patent Owner has not introduced anything to contradict Mr. McQueen’s statement that the facts stated are within his personal knowledge.” *Id.* at 8. With respect to paragraphs 16–21 of the Declaration of Mr. McQueen, we determine that Patent Owner’s objections go to the weight that we accord to Mr. McQueen’s testimony, rather than the admissibility of these paragraphs of the Declaration of Mr. McQueen. We are capable of according the appropriate weight to this testimony. Therefore, we deny Patent Owner’s request to exclude paragraphs 16–21 of the Declaration of Mr. McQueen.

2. Declaration of Dr. Kazerooni

Dr. Kazerooni’s and Mr. McQueen’s declarations were filed on the same date, March 10, 2014. Petitioner contends that Patent Owner did not object to the Declaration of Dr. Kazerooni until twenty-one (21) days after

the filing of the declaration. Paper 61, 11; *see* 37 C.F.R. § 42.64(b)(1) (“[A]ny objection must be served within five business days of service of evidence to which the objection is directed.”). Patent Owner does not dispute that it failed to object in a timely manner to the Declaration of Dr. Kazerooni. *See* Paper 58, 3; Paper 61, 4–5. Because we determine that the objections to the Declaration of Dr. Kazerooni were untimely, we deny the request to exclude his declaration.

III. CONCLUSION

We conclude that Petitioner has demonstrated by a preponderance of the evidence that (1) claims 1, 2, 13, 14, 16, and 19–21 are anticipated under 35 U.S.C. § 102(b) by Myers; (2) claims 1–5 and 19–21 are rendered obvious under 35 U.S.C. § 103(a) by Henkin and Myers; and (3) claims 1–9 and 19–21 are rendered obvious under 35 U.S.C. § 103(a) by Pansini and Myers. Further, Patent Owner’s Replacement Corrected Motion to Amend Claims is *denied*, and Patent Owner’s Motion to Exclude Evidence is *granted-in-part* and *denied-in-part*.

This is a final written decision of the Board under 35 U.S.C. § 318(a). Parties to the proceeding seeking judicial review of this decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IV. ORDER

Accordingly, it is hereby:

ORDERED that claims 1–9, 14, 16, and 19–21 of the ’183 Patent are held *unpatentable*;

FURTHER ORDERED that Patent Owner’s Replacement Corrected Motion to Amend Claims is *denied*;

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FURTHER ORDERED that Patent Owner's Motion to Exclude Evidence is *granted-in-part* with respect to paragraph 23 of the Declaration of Mr. McQueen and *denied-in-part* with respect to the remaining challenged paragraphs of the Declaration of Mr. McQueen and with respect to the Declaration Dr. Kazerooni; and

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

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