

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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DYSON TECHNOLOGY LIMITED and DYSON, INC.,  
Petitioner,

v.

OMACHRON INTELLECTUAL PROPERTY INC.,  
Patent Owner.

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IPR2024-01162  
Patent 11,903,546 B2

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Before ERIC C. JESCHKE, MATTHEW S. MEYERS, and  
BRENT M. DOUGAL, *Administrative Patent Judges*.

Opinion of the Board filed by *Administrative Patent Judge* JESCHKE.

Opinion Dissenting filed by *Administrative Patent Judge* DOUGAL.

JESCHKE, *Administrative Patent Judge*.

DECISION  
Granting Institution of *Inter Partes* Review  
35 U.S.C. § 314

## I. BACKGROUND

Dyson Technology Limited and Dyson, Inc. (collectively, “Petitioner”) filed a Petition to institute *inter partes* review of claims 1–15 of U.S. Patent No. 11,903,546 B2 (Ex. 1001, “the challenged patent”). Paper 1 (“Pet.”). Omachron Intellectual Property Inc. (“Patent Owner”) timely filed a Preliminary Response. Paper 8 (“Prelim. Resp.”). With the filing of the Preliminary Response, Patent Owner filed a statutory disclaimer of independent claims 8 and 14. *See* Prelim. Resp. 7; Ex. 2001 (Disclaimer in a Patent under 37 C.F.R. § 1.321(a), dated October 28, 2024). No claims depend from claims 8 or 14. Under 37 C.F.R. § 42.107(e), “[n]o *inter partes* review will be instituted based on disclaimed claims.” Thus, in the discussion below, we will only address Petitioner’s challenges to claims 1–7, 9–13, and 15 (the “challenged claims”).

We have authority to determine whether to institute *inter partes* review. *See* 35 U.S.C. § 314 (2018); 37 C.F.R. § 42.4(a) (2024) (“The Board institutes the trial on behalf of the Director.”). *Inter partes* review may not be instituted “unless . . . the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314. Upon consideration of the evidence and arguments in the record, for the reasons below, we determine that the information presented shows a reasonable likelihood that Petitioner would prevail with respect to at least one of challenged claims 1–7, 9–13, and 15. We thus institute *inter partes* review on all challenged claims on all asserted grounds. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1354, 1359–60 (2018); 37 C.F.R. § 42.108(a) (“When instituting *inter partes* review, the

Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”).

*A. Related Proceedings*

The parties identify a proceeding in the U.S. International Trade Commission involving the challenged patent: *Certain Surface Cleaning Devices and Components Thereof*, Dkt. No. 337-TA-1404 (U.S. I.T.C.), filed April 23, 2024. Pet. 136; Paper 3 (Patent Owner’s Mandatory Notices) at 1. The ITC Litigation also involves U.S. Patent No. 11,910,984 B2 (the “’984 patent”).

Petitioner filed a petition for *inter partes* review of claims 1–18 of the ’984 patent in IPR2024-01151. *See Dyson Tech. Ltd. & Dyson, Inc. v. Omachron Intell. Prop. Inc.*, IPR2024-01151, Paper 2 (PTAB July 2, 2024). We grant institution in that proceeding concurrently with this Decision. *See* IPR2024-01151, Paper 8.

*B. The Challenged Patent*

The challenged patent “relates to the field of surface cleaning apparatus” and specifically “to a type of stick vacuum cleaner wherein a hand vacuum cleaner is removably mounted to a drive handle and provides motive power to draw dirty air into the surface cleaning head.” Ex. 1001, 1:23–27.

Figure 1 is reproduced below:

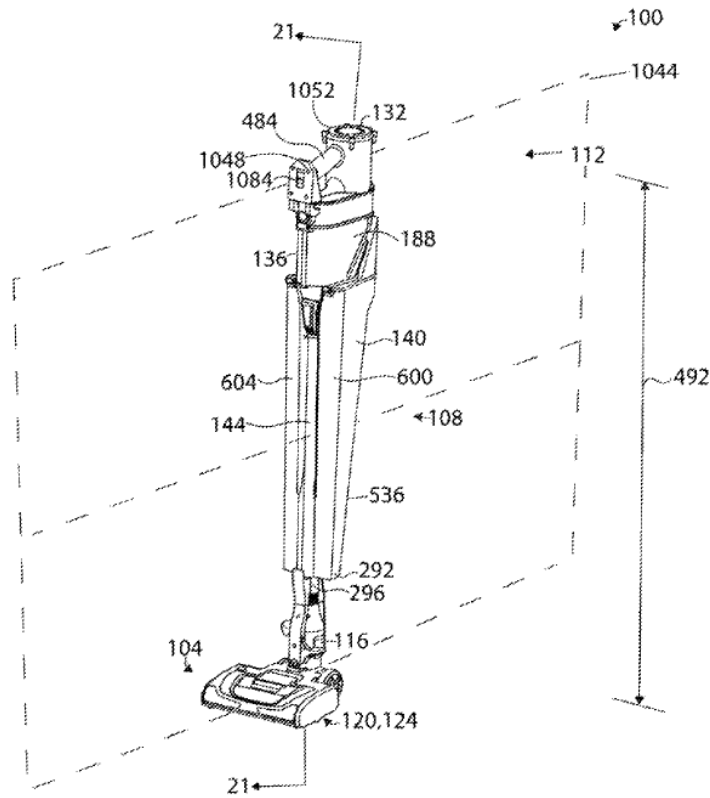


**FIG. 1**

Figure 1 depicts a front perspective view of a surface cleaning apparatus. Ex. 1001, 4:8–9. Depicted surface cleaning apparatus 100 generally includes surface cleaning head 104, upright section 108, and hand vacuum cleaner 112. *Id.* at 9:66–10:6. Hand vacuum cleaner 112 “may be removably connected to upright section 108.”<sup>1</sup> *Id.* at 10:21–22. A user grasps hand vacuum cleaner 112 to manipulate upright section 108, thereby steering surface cleaning head 104 across a surface for cleaning. *Id.* at 10:22–25. As shown in Figure 1, upright section 108 may include a

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<sup>1</sup> In this Decision, we omit emphasis on reference numerals in quotations from the challenged patent and prior art references.

removable auxiliary dirt collection assembly 140, which augments the dirt collection capacity of surface cleaning apparatus 100. *See id.* at 11:25–45.

Figure 4 is reproduced below:

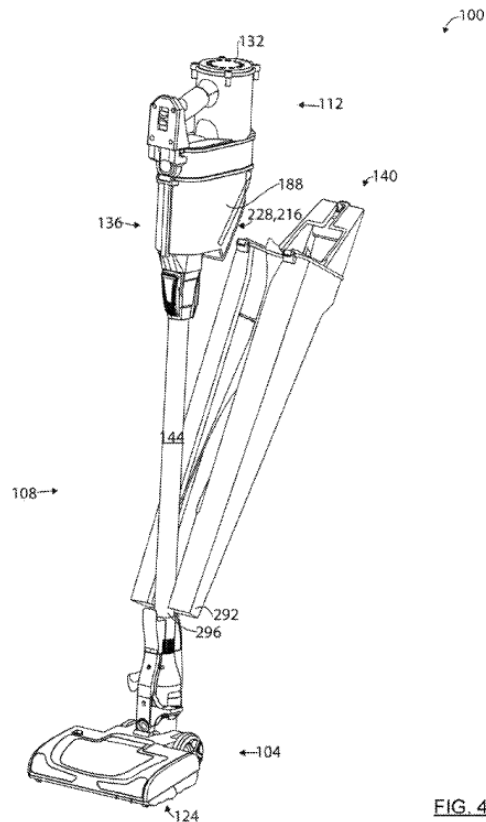


FIG. 4

Figure 4 is a front perspective view of the apparatus of Figure 1 with supplemental dirt collection chamber 140 partially removed. Ex. 1001, 4:14–16. The challenged patent discloses that removing supplemental dirt collection chamber 140 allows disposal of the enclosed dirt and debris and also allows operation of surface cleaning apparatus 100 “in a light weight upright mode.” *Id.* at 15:29–33.

### C. The Challenged Claims

Petitioner challenges claims 1–7, 9–13, and 15, of which claims 1, 9, 10, and 15 are independent. Claims 2–7 depend from claim 1, and claims 11–13 depend from claim 10. Independent claim 1 is reproduced

below, reformatted from the version provided in the challenged patent and with bracketed alphanumerical designations added to identify each clause:

1. [1pre] A surface cleaning apparatus comprising:

[1a] a hand vacuum cleaner having a front end having a dirty air inlet, a rear end, a clean air outlet, an upper end, a lower end and a pistol grip handle, the hand vacuum cleaner comprising:

[1a.1] a main body comprising an upper end, a lower end, a front end and a rear end, the main body housing a suction motor and fan assembly, the suction motor and fan assembly having a suction motor axis of rotation;

[1a.2] a cyclone unit comprising a cyclone chamber having a cyclone axis of rotation, a front end, an axially spaced apart rear end, a cyclone air inlet, and a cyclone air outlet provided at the rear end of the cyclone unit, wherein the cyclone axis of rotation intersects the pistol grip handle; and

[1a.3] a dirt collection chamber that is exterior to the cyclone chamber and a forward end of the dirt collection chamber is openable;

[1b] a surface cleaning head having a front end, a rear end, a dirty air inlet and a surface cleaning head air outlet; and,

[1c] a rigid air flow conduit that is removably mountable to the surface cleaning head and, when attached to the hand vacuum cleaner and the surface cleaning head, extends between the surface cleaning head air outlet and the dirty air inlet of the hand vacuum cleaner,

[1d] wherein the dirty air inlet of the hand vacuum cleaner is removably drivingly mounted to a downstream end of the rigid air flow conduit whereby when the hand vacuum cleaner is mounted to the downstream end of the rigid air flow conduit, the pistol grip handle is a driving handle for the surface cleaning apparatus, and

[1e] wherein when the hand vacuum cleaner is positioned with the front end of the hand vacuum cleaner in front of the rear end of the hand vacuum cleaner, the cyclone axis of rotation is generally horizontal.

Ex. 1001, 51:53–52:24.<sup>2</sup>

*D. Asserted Grounds of Unpatentability*

Petitioner challenges claims 1–7, 9–13, and 15 on the following grounds:

| Claim(s) Challenged | 35 U.S.C. § <sup>3</sup> | Reference(s)/Basis                        |
|---------------------|--------------------------|-------------------------------------------|
| 1–7, 9–13, 15       | 103                      | Butler, <sup>4</sup> Jianan <sup>5</sup>  |
| 1–7, 9–13, 15       | 103                      | IPVG, <sup>6</sup> Conrad335 <sup>7</sup> |

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<sup>2</sup> We adopt and apply below Petitioner’s designations for the elements of the challenged claims. *See* Pet. viii–xiv (showing alphanumerical designations for the language in the challenged claims). We have removed the alphabetical designations originally provided in claim 1. *See* Ex. 1001, 51:53–52:24.

<sup>3</sup> The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. §§ 102, 103 that became effective on March 16, 2013. Pub. L. No. 112-29, §§ 3(b)–3(c), 3(n)(1), 125 Stat. 284, 285–87, 293 (2011). Because there is no dispute that the challenged claims have effective filing dates after March 16, 2013, we apply the AIA versions of the statutes. We would reach the same outcome, however, under the pre-AIA versions.

<sup>4</sup> International Publication WO 2007/084543 A2, published July 26, 2007 (Ex. 1005, “Butler”).

<sup>5</sup> CN 101061932A (and certified translation), published October 31, 2007 (Ex. 1021 (Chinese version) and Ex. 1006 (certified translation), “Jianan”).

<sup>6</sup> GB 283,179, published August 9, 1928 (Ex. 1007, “IPVG”). “IPVG” are the initials of the Swiss corporate entity that filed the application that published as GB 283,179: **Inventia Patent-Verwertungs-Gesellschaft**.

<sup>7</sup> US 2007/0209335 A1, published September 13, 2007 (Ex. 1008, “Conrad335”).

Petitioner supports its challenges with a declaration from Dr. Robert Giachetti. Ex. 1002 (“the Giachetti Declaration” or “Giachetti Decl.”).

## II. DISCUSSION

### *A. The Level of Ordinary Skill in the Art*

The level of ordinary skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). The person of ordinary skill in the art is a hypothetical person presumed to have known the relevant prior art. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In determining the level of ordinary skill in the art, we may consider certain factors, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *Id.* (internal quotation marks and citation omitted).

Petitioner contends that a person having ordinary skill in the art “would have had a bachelor’s degree in mechanical engineering or a similar field and 2–3 years of experience in fluid dynamics and/or machine design for devices related to fluid dynamics, such as vacuum cleaners.” Pet. 12. Petitioner also states that “[a]dditional education could offset less experience and vice versa, and [one of ordinary skill in the art] could have also obtained similar knowledge and experience through other means.” *Id.*

Patent Owner “does not challenge” Petitioner’s proposed definition of the level of ordinary skill in the art, but “reserves the right to provide an alternative definition . . . if IPR is instituted.” Prelim. Resp. 2.

For purposes of this Decision, we adopt the definition of the level of ordinary skill in the art proposed by Petitioner, which appears consistent

with the record at this stage of the proceeding, including the prior art. *See GPAC Inc.*, 57 F.3d at 1579.

*B. Claim Construction*

In *inter partes* reviews, the Board interprets claim language using the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), as described in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b). Under that standard, we generally give claim terms their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1313–14. Although extrinsic evidence, when available, may also be useful when construing claim terms under this standard, extrinsic evidence should be considered in the context of the intrinsic evidence. *See id.* at 1317–19.

Neither Petitioner nor Patent Owner proposes constructions for any claim terms. *See* Pet. 12; Prelim. Resp. 2. Based on the current record, we need not construe explicitly any claim terms because doing so would not change the outcome of the analysis below. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

*C. Asserted Obviousness of Claims 1–7, 9–13, and 15 Based on Butler and Jianan*

Petitioner asserts that claims 1–7, 9–13, and 15 of the challenged patent would have been obvious based on Butler and Jianan. Pet. 2, 13–77.

Patent Owner provides arguments addressing this asserted ground. Prelim. Resp. 7–27. We first summarize aspects of the prior art.

### *1. Overview of Butler*

Butler discloses “a vacuum cleaner that can be used to clean floors and carpets, but is particularly adapted to clean stair treads or other elevated horizontal surfaces, stair risers and other inclined or vertical surfaces, and surfaces located in confine[d] spaces.” Ex. 1005, 7:2–5.<sup>8</sup>

Figure 2A and Figure 2D of Butler are reproduced below:

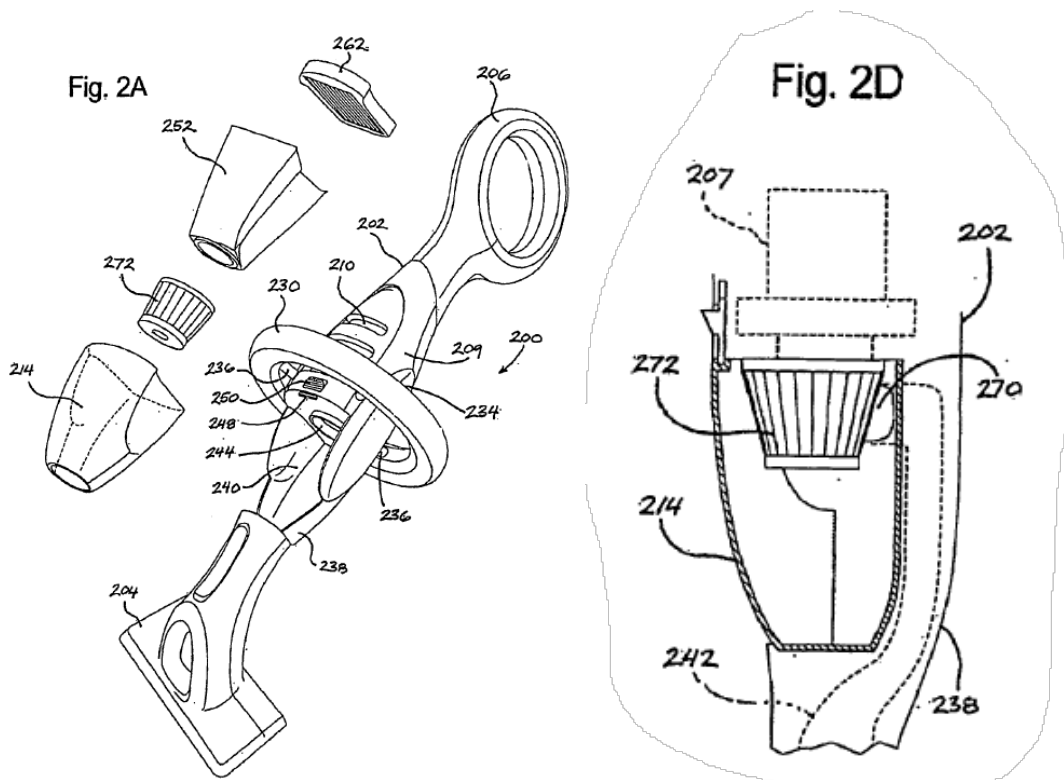


Figure 2A above on the left shows a perspective view of a vacuum cleaner, including “various complementary parts.” Ex. 1005, 4:9–10.

Figure 2D above on the right is “a cutaway schematic view of a cyclone

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<sup>8</sup> Like Petitioner and Patent Owner, we cite to the native pagination in Butler, rather than the page numbering added by Petitioner in the bottom right corner of each page.

separator configuration that may be employed with the embodiment of Figure 2A.” *Id.* at 4:15–16. Vacuum cleaner 200 depicted in Figure 2A includes rear grip 206, elongated housing 202, foregrip 230, inlet nozzle 204, and fan/motor chamber 209. *See id.* at 15:20–24. Figure 2A also depicts dirt receptacle 214, which is shown detached from vacuum cleaner 200, but is “shaped and sized to be selectively positionable in the pocket 240.” *Id.* at 16:14–15. Butler discloses that “various different types of dirt receptacle 214 may be used, and may be interchangeable with one another to provide the user with various cleaning options,” including examples shown in Figures 2A–2D. *Id.* at 16:26–29.

As shown above, the exemplary dirt receptacle 214 in Figure 2D includes “a cyclone separation chamber in which the working airflow is swirled to remove dirt and dust by centrifugal or cyclonic action.” Ex. 1005, 18:4–5. As shown, “inlet air passage 242 enters or terminates at an inlet port 270 through the dirt receptacle sidewall in a tangential or nearly tangential manner, which initiates a cyclonic flow therein.” *Id.* at 18:7–10. The embodiment shown includes frusto-conical filter 272 over fan/motor inlet opening 244 to prevent debris from entering fan/motor 207, but Butler discloses that “any alternative filter shape, material, construction or filtration grade may be used, and multiple filter layers may also be used, as known in the art.” *Id.* at 18:10–14.

## 2. Overview of *Jianan*

*Jianan* relates to “a rechargeable handheld vacuum cleaner using a parallel cyclone as a separation device.” Ex. 1006 at 3.<sup>9</sup>

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<sup>9</sup> Like Petitioner and Patent Owner, we cite to the page numbering added by Petitioner in the bottom right corner of each page.

Figure 3 of Jianan is reproduced below:

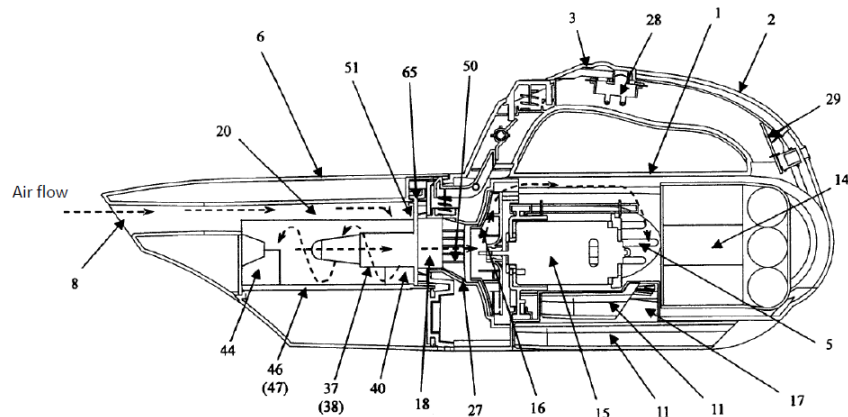


Fig. 3

Figure 3 is a cross-sectional view of a handheld vacuum cleaner. Ex. 1006 at 5. In operation, battery pack 14 powers motor 15 to rotate impeller 16, thereby generating suction at air inlet passage 8 to pull dirty air through air inlet passage 20 and into dual parallel cyclones 46 and 47. *Id.* at 8; *see also* Fig. 6 (showing top-down view with parallel cyclones 46 and 47). The dirty air is then cleaned “by cyclone separation” before the clean air flows into main housing 1 and out slit 5 (as shown by the dotted lines). Ex. 1006 at 8.

Figure 5 is reproduced below:

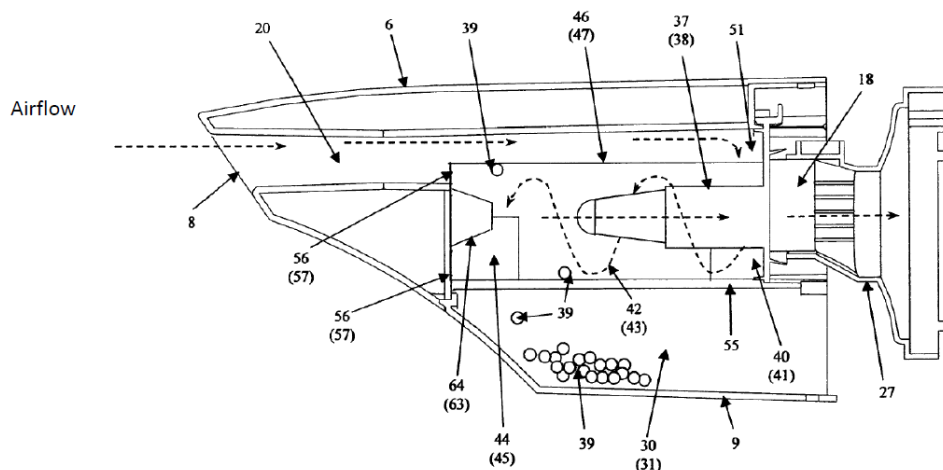


Fig. 5

Figure 5 is a side cross-sectional view depicting a closeup of the dust cup portion of the handheld vacuum cleaner of Figure 3. Ex. 1006 at 5. Dust cup 6 includes two parallel cyclones 46 and 47, one of which is shown above, which receive dirty air via cyclone openings 40 and 41 (respectively) after the airflow is divided into two airflows by wall 55. *Id.* at 9. The dirty air then travels in vortices 42 and 43, with dust particles 39 being moved out of the vortices via cyclonic separation and escaping through cyclone ends 44 and 45 into cavity 30 of dust collection chamber 9. *Id.*

### *3. Independent Claims 1, 9, 10, and 15*

For independent claims 1, 9, 10, and 15, Petitioner contends that the proposed combination of Butler and Jianan discloses each limitation. Pet. 13–69. To support its arguments, Petitioner identifies certain passages in the cited references and explains the significance of each passage with respect to the corresponding claim limitation. Pet. 22–69. Petitioner also articulates reasons to combine the relied-upon aspects of Butler and Jianan. Pet. 13–22. Patent Owner (1) challenges the articulated reasons to combine Butler and Jianan, (2) argues that the combination of Butler and Jianan does not satisfy the axis intersects limitation (a portion of limitation 1a.2 in claim 1 and limitation 9a.2 in claim 9), and (3) argues that the combination of Butler and Jianan does not satisfy the handle extends limitation (a portion of limitation 10a.1 in claim 10 and limitation 15a.1 in claim 15). *See Prelim. Resp.* 7–27.

We have reviewed Petitioner’s contentions with respect to independent claims 1, 9, 10, and 15, and for the reasons below, we determine that the Petition shows a reasonable likelihood that Petitioner would prevail in demonstrating that claims 1 and 9 would have been obvious

based on Butler and Jianan. We address in turn each of Patent Owner's arguments.

*a. The Combination of Butler and Jianan*

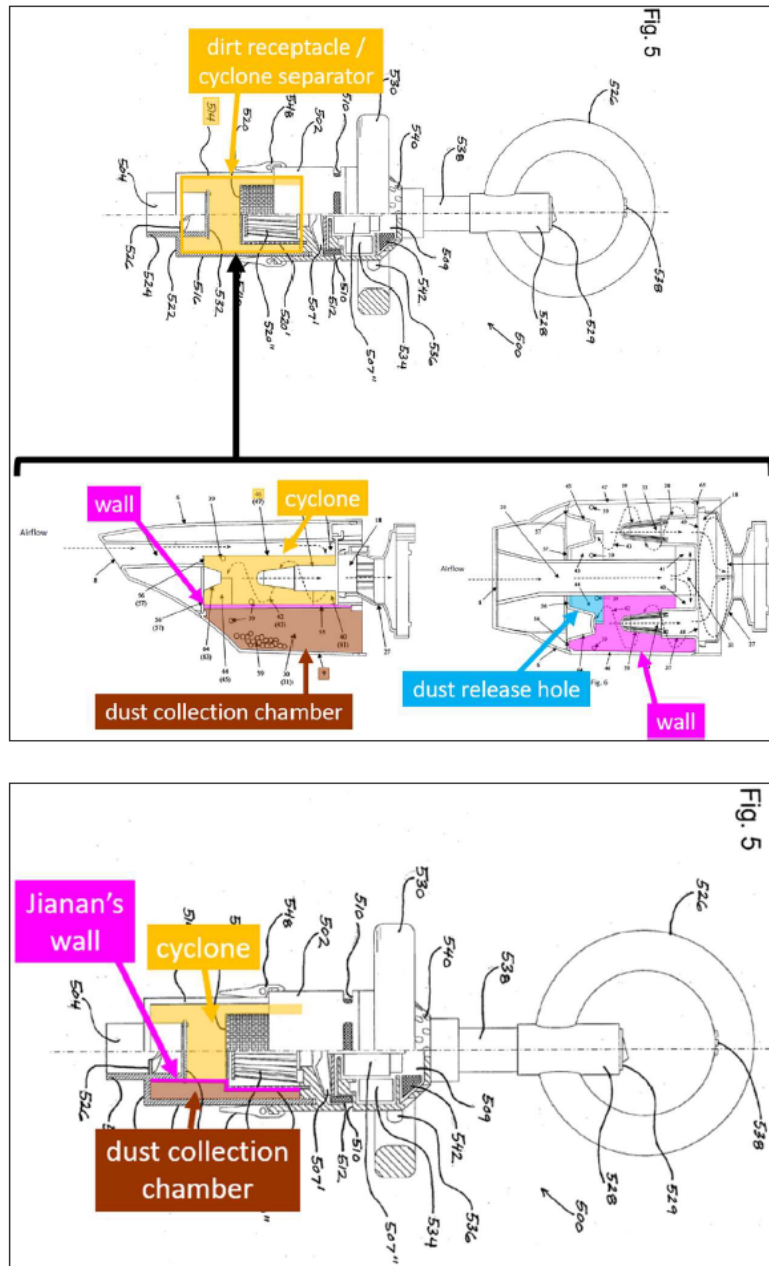
Petitioner asserts that one of ordinary skill in the art would have been motivated to combine Butler and Jianan as proposed, with a reasonable expectation of success. *See* Pet. 13–22. Specifically, Petitioner first summarizes the teachings of a dirt receptacle comprising a cyclone separator in Figure 5 of Butler and summarizes the teachings of two parallel cyclones and a dust receiving chamber separated by a wall in Figures 3, 5, and 6 of Jianan. *See* Pet. 13–15.

As to the motivation to combine, Petitioner states that one of ordinary skill in the art “would have been motivated to modify Butler to achieve the benefits of Jianan’s cyclonic-separation system having an independent dust-collection chamber in multiple ways.” Pet. 15 (Giachetti Decl. ¶¶ 83–97). Petitioner then provides *at least three*—and according to Patent Owner, four—*alternative* proposed combined devices (which we will refer to as “alternative devices”) that allegedly satisfy the limitations in the challenged claims. Pet. 15–17.

As to the first alternative device, Petitioner asserts that one of ordinary skill in the art would have been motivated “to modify Butler’s ‘dirt receptacle compris[ing] a cyclone separator’ to have an ‘independent dust collection chamber,’ oriented and functioning in the same way that Jianan teaches—by separating the ‘cyclone’ chamber from the ‘independent dust

collection chamber' using a horizontal 'wall' with a 'dust release hole.'"<sup>10</sup>

Pet. 15. In support, Petitioner provides the upper annotated composite images and the lower annotated composition image below:



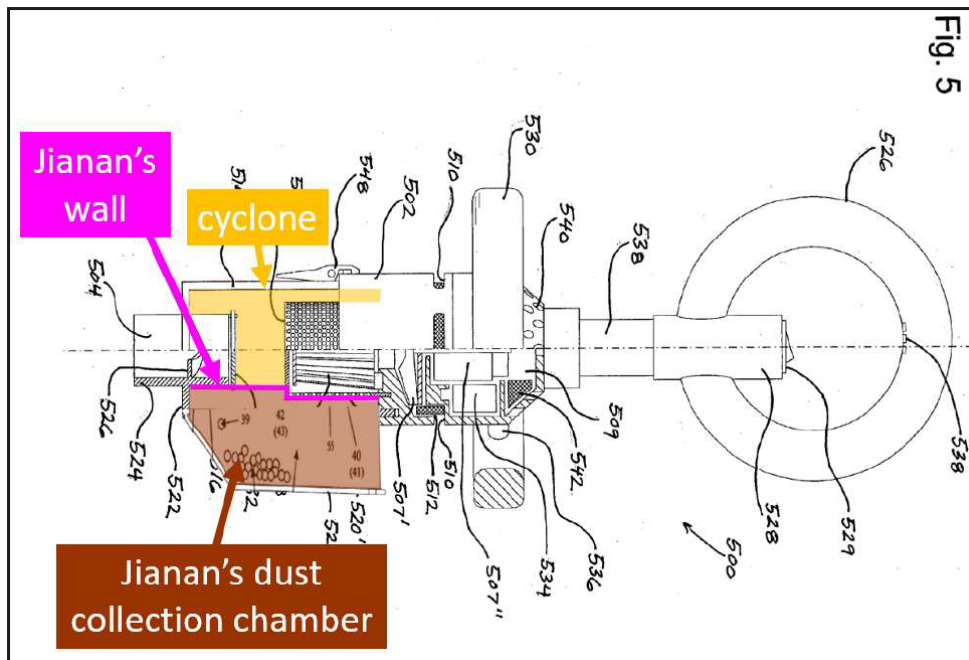
<sup>10</sup> Some statements in the Petition (including the statement quoted here) include bolding and coloring for certain phrases. Here and elsewhere, we do not include such bolding and coloring in quotations from the Petition.

Pet. 16 (citing Ex. 1005, Fig. 5 (modified); Ex. 1006, Figs. 5, 6; Giachetti Decl. ¶ 83). The upper annotated composite image includes two general areas—a lower area and an upper area. The upper area includes an annotated version of Figure 5 of Butler, to which Petitioner has added an orange text box and orange shading identifying a “dirt receptacle/ cyclone separator.” *Id.* The lower area includes two annotated figures, surrounded by a black bracket with a black line pointing to the “dirt receptacle/ cyclone separator” in the upper area. The leftmost of the two annotated figures in the lower area is an annotated version of Figure 5 of Jianan, to which Petitioner has added (1) an orange text box and orange shading identifying a “cyclone,” (2) a pink text box and pink horizontal line identifying a “wall,” and (3) a brown text box and brown shading identifying “dust collection chamber.” *Id.* The rightmost of the two annotated figures in the lower area is an annotated version of Figure 6 of Jianan, to which Petitioner has added (1) a blue text box and blue shading identifying a “dust release hole” and (2) a pink text box and pink shading identifying a “wall.” *Id.*

The lower composite annotated image is an annotated version of Figure 5 of Butler, to which Petitioner has added (1) an orange text box and orange shading identifying a “cyclone,” (2) a pink text box and pink stepped horizontal line identifying “Jianan’s wall,” and (3) a brown text box and brown shading identifying “dust collection chamber.” *Id.*

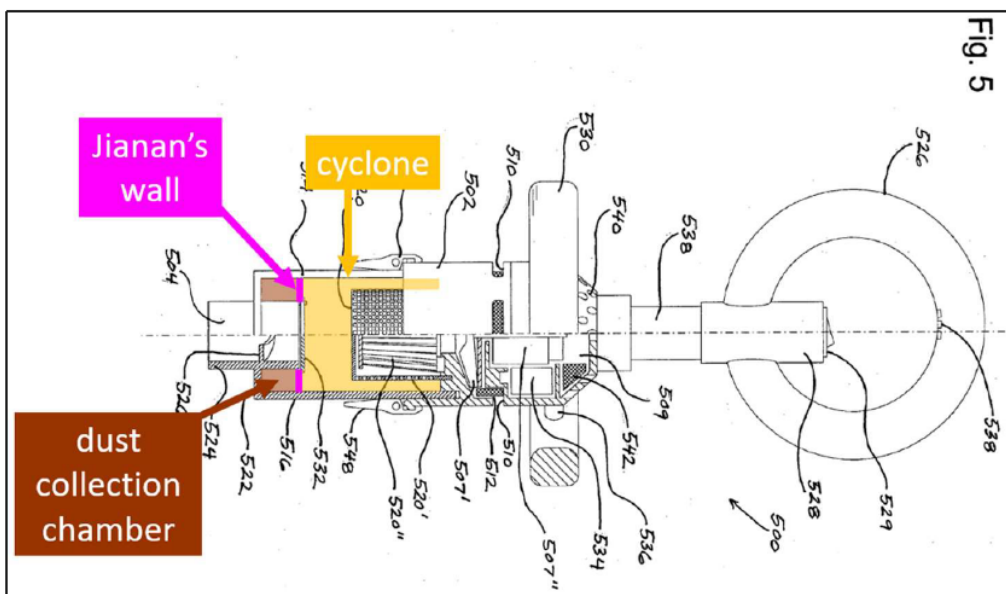
Turning to the second alternative device, Petitioner states that one of ordinary skill in the art “also would have been motivated to modify Butler’s ‘dirt receptacle compris[ing] a cyclone separator’ to include an extended ‘independent dust collection chamber’ and a horizontal ‘wall’ as Jianan

teaches,” with Petitioner then providing this annotated version of Figure 5 of Butler, which includes a portion of Figure 5 of Jianan:



Pet. 16–17 (citing Ex. 1005, Fig. 5 (modified); Ex. 1006, Fig. 5 (modified); Giachetti Decl. ¶ 84). In the annotated version of Figure 5 of Butler here, Petitioner added (1) an orange text box and orange shading identifying a “cyclone,” (2) a pink text box and pink stepped horizontal line identifying “Jianan’s wall,” and (3) a brown text box and a portion of Figure 5 of Jianan overlaid on Butler’s vacuum with brown shading identifying “Jianan’s dust collection chamber.” *Id.*

For the third alternative device, Petitioner states that one of ordinary skill in the art “would have also been motivated to modify Butler’s ‘dirt receptacle compris[ing] a cyclone separator’ to have an ‘independent dust collection chamber’ separated from the cyclone chamber by a vertically oriented ‘wall,’” with Petitioner then providing this annotated version of Figure 5 of Butler:



Pet. 17 (citing Ex. 1005, Fig. 5 (modified); Giachetti Decl. ¶ 85). In the annotated version of Figure 5 of Butler here, Petitioner added (1) an orange text box and orange shading identifying a “cyclone,” (2) a pink text box and pink vertical lines identifying “Jianan’s wall,” and (3) a brown text box and brown shading identifying “dust collection chamber.” *Id.*

Petitioner then discusses (1) why both Butler and Jianan are analogous art to the claimed invention, (2) why both Butler and Jianan provide express motivations for the proposed combination, (3) why one of ordinary skill in the art would have understood that certain benefits of cyclone units with an exterior dirt collection chamber could be achieved “by implementing Jianan’s independent dust-collection chamber teachings in various ways,” (4) why the proposed combination would have been a simple substitution of known elements to obtain predictable results, and (5) why the proposed combination would have been at least obvious to try. Pet. 18–22 (citing Giachetti Decl. ¶¶ 86–97). Finally, Petitioner addresses why one of ordinary skill in the art would have had a reasonable expectation of success in the proposed combination. *See* Pet. 22 (citing Giachetti Decl. ¶ 98).

Patent Owner presents five arguments as to why one of ordinary skill in the art would not have been motivated to combine Butler's cyclonic chamber with Jianan's separate dirt collection chamber, as proposed. Prelim. Resp. 7–21; *see also id.* at 8 (highlighting language in each independent claim requiring a dirt collection chamber exterior to the cyclone chamber). First, Patent Owner argues that the first two alternative devices “do not retain the annular volume around the filter,” but rather, Petitioner proposes to “modify Butler by adding a horizontal dividing wall in the cyclone chamber, cutting through the cyclone chamber volume, and blocking the lower portion of the filter.” Prelim. Resp. 13. According to Patent Owner, these proposed modifications would lead to several technical issues: (1) “reducing the volume available for cyclonic effect,” (2) “reduc[ing] the surface area of the filter (520) through which air exits chamber 514,” thereby “[r]educing airflow out of the chamber,” (3) “increas[ing] back pressure” and thus “inhibiting the cyclonic flow,” and (4) needing “more frequent cleaning/replacement of the filter as it gets blocked with debris.” *Id.* at 14.

At this stage of the proceeding, the alleged technical issues raised by Patent Owner are mere attorney argument, unsupported by declaration testimony or other evidence as to the understanding of one of ordinary skill in the art on the relevant issue. *See Elbit Sys. of Am., LLC v. Thales Visionix, Inc.*, 881 F.3d 1354, 1359 (Fed. Cir. 2018) (“‘[A]ttorney argument is not evidence’ and cannot rebut other admitted evidence.” (quoting *Icon Health & Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1043 (Fed. Cir. 2017))). Turning to Patent Owner's argument that the “wall” in Figure 5 of Jianan is “flat,” whereas “Jianan's wall[s]” identified in the first two

alternative device are “stepped” (Prelim. Resp. 14–15), we note that “[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference,” but rather “what the combined teachings of the references would have suggested to those of ordinary skill in the art.” *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) *see also KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007) (“A person of ordinary skill is also a person of ordinary creativity, not an automaton.”). Dr. Giachetti’s testimony as to the first two alternative devices remains unrebutted at this stage. *See* Giachetti Decl. ¶¶ 83–84, *cited at* Pet. 15–17.

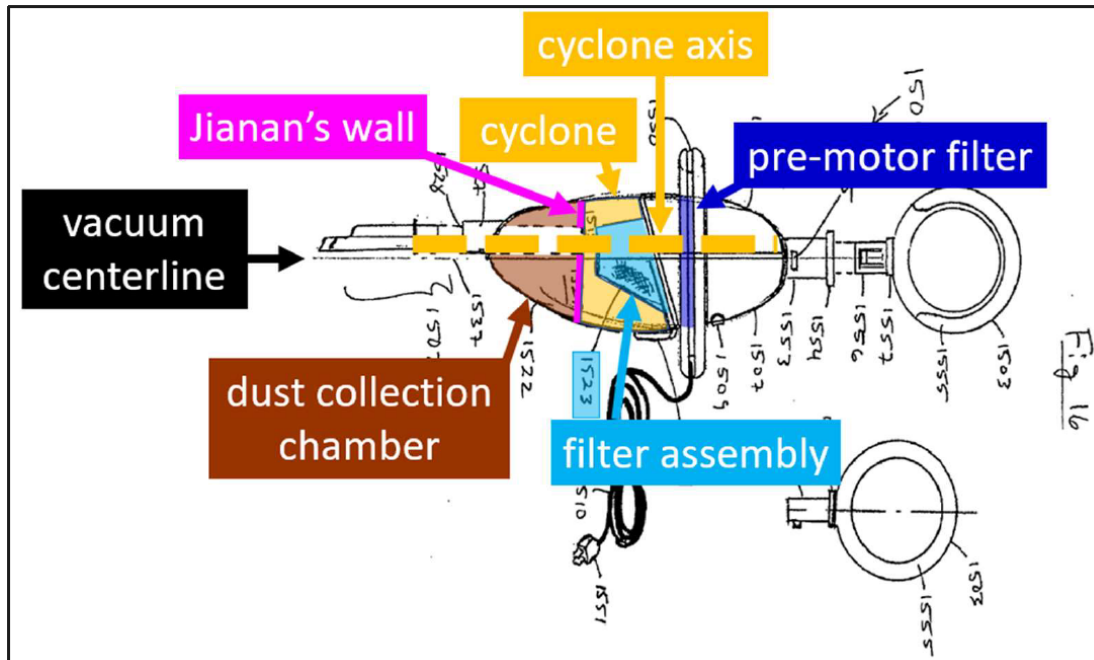
Turning to its second argument, Patent Owner asserts that the third alternative device “does no better” than the first two because the vertical wall added to that “proposed combination cuts off a portion of the cyclone chamber—this time it is the annular portion around the inlet tube 524.” Prelim. Resp. 15. Patent Owner alleges that, with the third alternative device, Petitioner proposes to eliminate the inlet tube that protrudes into the cyclone chamber, but Petitioner provides “no discussion or consideration of the effect on the efficiency of cyclonic separation.” *Id.* at 16.

As an initial matter, we disagree with Patent Owner that, in the context of this third alternative device, Petitioner proposes to eliminate the inlet tube on the left side of the embodiment in Figure 5 of Butler. Indeed, the annotated version of Figure 5 of Butler in the discussion of this third alternative device shows the inlet tube, and Patent Owner does not explain how Petitioner allegedly proposes eliminating that structure. *See* Pet. 17. Patent Owner’s argument does, however, raise questions as to the operation of the third alternative device, especially in light of the discussion of helical

ramp 526, which, according to Butler, establishes the cyclonic airflow within dirt receptacle 514 in the embodiment shown in Figure 5. *See* Prelim. Resp. 9–11 (discussing the operation of the embodiment in Figure 5 of Butler); *see also* Ex. 1005, 22:14–22 (same). Specifically, it is unclear how cyclonic airflow *could be* created in the third alternative device when helical ramp 526 would empty directly into the new “dust collection chamber” to the left of “Jianan’s wall” (*see* Pet. 17 (bottom)) rather than into the “cyclone” as in the first two alternative devices (*see* Pet. 16–17). Moreover, on the current record, we share Patent Owner’s questions as to how the third alternative device would allow the use of centrifugal force to direct dirt particles into the identified “dust collection chamber.” *See* Prelim. Resp. 18 (arguing that the third alternative device “would not lead to particles being propelled by centrifugal force or by air flow to the dividing wall, and the Petition offers no support for this particular arrangement”).

Patent Owner adds that the third alternative device “is deficient for another reason”: “there is no disclosure in Jianan of a vertical wall, and it would be contrary to [Jianan’s] teachings” because “[e]very disclosure in Jianan show[s] a dust collection chamber separated by a horizontal wall that is parallel with the cyclone’s axis of rotation.” Prelim. Resp. 16. Again, the test for obviousness is not bodily incorporation but rather “what the combined teachings of the references would have suggested to those of ordinary skill in the art.” *In re Keller*, 642 F.2d at 425. In the context of the third alternative device, however, the issues discussed above raise questions as to whether one of ordinary skill in the art would have modified the “wall” to be vertical, as proposed.

As its third argument, Patent Owner identifies an alleged *fourth* alternative device, shown below:



Prelim. Resp. 19.<sup>11</sup> In the annotated version of Figure 16 of Butler here, Petitioner added (1) an orange text box and orange shading identifying a “cyclone,” (2) an orange text box and orange dotted line identifying a “cyclone axis,” (3) a pink text box and pink vertical line identifying “Jianan’s wall,” (4) a brown text box and brown shading identifying “dust collection chamber,” (5) a black text box identifying a “vacuum centerline,” (6) a light blue text box and light blue shading identifying a “filter assembly,” and (7) a dark blue text box and dark blue shading identifying a “pre-motor filter.” *Id.*; Pet. 44. According to Patent Owner, this alleged fourth alternative device “fares no better” because “this configuration would still have the same shortfalls as the third [alternative device]—*e.g.*, it relies

<sup>11</sup> Patent Owner incorrectly cites page 17 of the Petition for this annotated figure, which actually appears on page 44.

on a wall orientation that is not disclosed in Jianan and would fail to operate in the same manner as the horizontal wall that is actually disclosed in Jianan.” Prelim. Resp. 18–19.

To the extent Petitioner intended to propose this fourth alternative device, Patent Owner’s argument raises the same questions as to the operation discussed above as to the third alternative device, including how dirt would be deposited in the identified “dust collection chamber.”

In its fourth argument, Patent Owner argues that Petitioner “fails to offer a reasonable justification for how a [person of ordinary skill in the art] would select between its vertical and horizontal ‘Jianan’s walls.’” Prelim. Resp. 19. Patent Owner highlights Dr. Giachetti’s testimony regarding selecting different walls to clean different surfaces, and Patent Owner contends that “[b]y choosing a vertical wall over a horizontal wall, or vice versa, the [person of ordinary skill in the art] will have frustrated Butler’s objective of a device designed to clean both horizontal and vertical surfaces.” *Id.* at 20 (citing Giachetti Decl. ¶ 92; Ex. 1005, 7:2–5).

As an initial matter—and for the reasons discussed as to the third and alleged fourth alternative devices—on the current record, we question whether one of ordinary skill in the art would have modified Butler by adding a *vertical* wall to create a separate dust collection chamber. Regardless, on the current record, Patent Owner’s fourth argument does not identify a deficiency as to Petitioner’s assertion (in the context of the first two alternative devices) that one of ordinary skill in the art would have added a *horizontal* wall to create a separate dust collection chamber. Even assuming as correct Dr. Giachetti’s position that one of ordinary skill in the art “would have understood that implementing a horizontal ‘wall’ is

beneficial for cleaning vertical surfaces” (Giachetti Decl. ¶ 92, *cited at* Prelim. Resp. 20), that does not support Patent Owner’s argument that a vacuum with a horizontal wall *could not* clean horizontal surfaces. *See* Prelim. Resp. 20 (“By choosing a vertical wall over a horizontal wall, or vice versa, the [person of ordinary skill in the art] will have frustrated Butler’s objective of a device designed to clean both horizontal and vertical surfaces.”). Moreover, Patent Owner’s statements as to how one of ordinary skill in the art would have understood the relevant aspects of Butler and allegedly been dissuaded from the proposed modifications are mere attorney argument, unsupported by declaration testimony or other evidence as to the understanding of one of ordinary skill in the art on the relevant issue. *See Elbit Sys.*, 881 F.3d at 1359.

As the fifth and final argument on the reasons to combine Butler and Jianan, Patent Owner contends that Petitioner “failed to provide any motivation for why a [person of ordinary skill in the art] would be willing to limit the cyclonic air flow of Butler’s vacuum or the dust collection chamber of Jianan in order to implement its new version of ‘Jianan’s wall’” as proposed. Prelim. Resp. 20. According to Patent Owner, Petitioner “merely assert[s] that a [person of ordinary skill in the art] would understand that ‘the simple substitution of an integrated dirt-collection chamber for a separated one would achieve the predictable result of more efficient cyclonic air filtration and reduced pre-filter maintenance.’” Prelim. Resp. 20–21 (quoting Pet. 21). Patent Owner argues that “that statement ignores that the cyclonic air filtration portion of the Butler device is no longer intact, and Jianan’s dust collection chamber is in a new orientation relative to the cyclonic air flow.” *Id.* at 21.

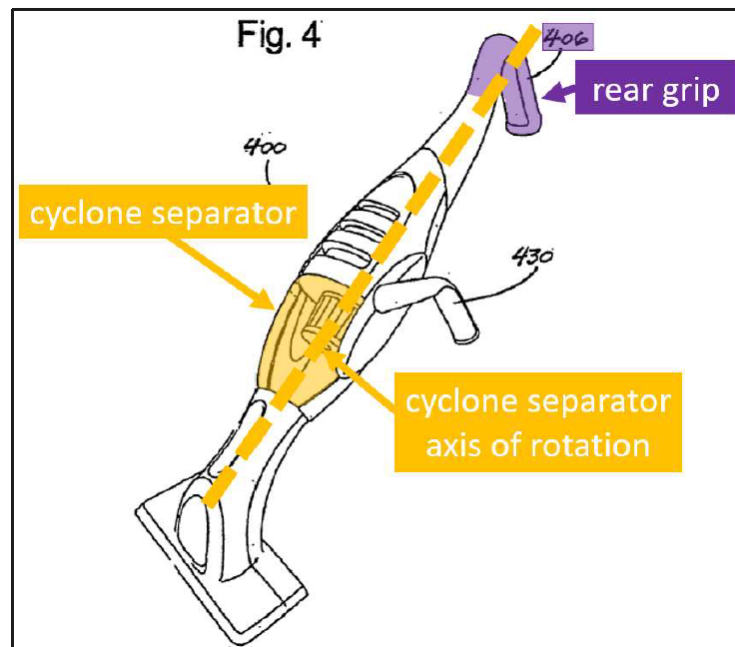
On the current record, Petitioner adequately explains the reasons to combine Butler with Jianan to arrive at the first two alternative devices. The discussion on the reasons to combine Butler and Jianan spans over nine pages of the Petition, with approximately twenty paragraphs of the Giachetti Declaration supporting that discussion. *See* Pet. 13–22; Giachetti Decl.

¶¶ 78–98. Patent Owner selects *one* statement from Petitioner’s discussion and asserts that that single statement is inadequate. Moreover, Patent Owner relies on mere conclusory attorney argument as to the alleged technical issues that would have been identified by one of ordinary skill in the art. *See Elbit Sys.*, 881 F.3d at 1359.

On the current record, we determine that Petitioner has made a sufficient showing that a person of ordinary skill in the art would have had reason to modify Butler and Jianan as proposed and that the articulated reasoning is supported by rational underpinning, at least as to the first two alternative devices (as discussed above).

*b. The Axis Intersects Limitations in Claims 1 and 9*

The axis intersects limitations in independent claims 1 and 9 each recite “wherein the cyclone axis of rotation intersects the pistol grip handle.” Ex. 1001, 52:1–2, 53:29–31. To address these limitations, Petitioner relies on Butler. Pet. 34–35 (citing Giachetti Decl. ¶ 129) (addressing claim 1); Pet. 37 (addressing claim 1). Specifically, Petitioner states that “Butler’s ‘cyclone separator’ axis of rotation and ‘cyclonic separation chamber’ axis of rotation (collectively cyclone separator axis of rotation) intersects ‘pistol-grip style rear grip 406,’” with Petitioner providing this annotated version of Figure 4 of Butler:

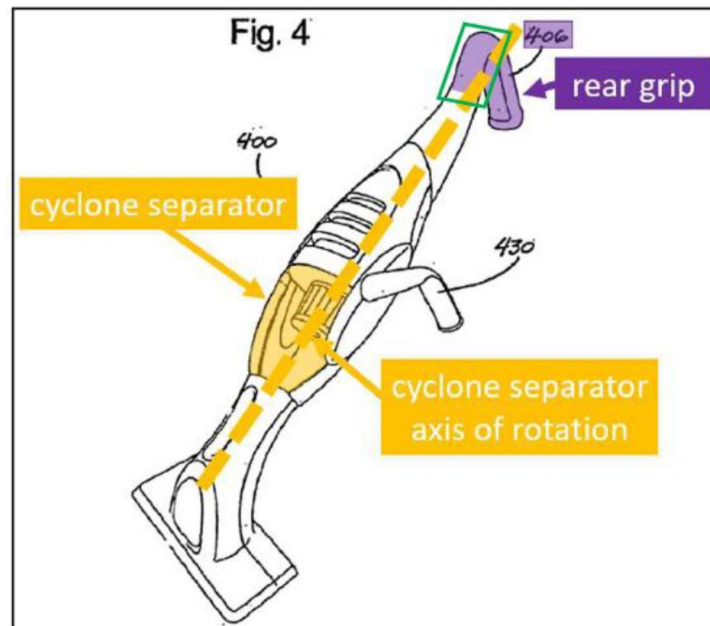


Pet. 34–35 (citing Ex. 1005, Fig. 4; Giachetti Decl. ¶ 129). In the annotated version of Figure 4 of Butler here, Petitioner added (1) an orange text box and orange shading identifying a “cyclone separator,” (2) an orange text box and an orange dotted line identifying a “cyclone separator axis of rotation,” and (3) a purple text box and purple shading identifying a “rear grip.” *Id.* For the axis intersects limitation in claim 9, Petitioner refers back to the discussion regarding claim 1. *See* Pet. 37.

Patent Owner argues that Petitioner has failed to show that the combination of Butler and Jianan satisfies the axis intersects limitations in claims 1 and 9. *See* Prelim. Resp. 21–24. First, Patent Owner contends that “Butler’s Figure 4 is a *different* embodiment than Figure 5, and Petitioner[] offers no reasons *why* a [person of ordinary skill in the art] would have—let alone *how* it would have—combined those two embodiments.” Prelim. Resp. 21 (quoting Ex. 1005, 20:4–5 (“Referring now to Figure 5, another embodiment of the invention is illustrated and described in detail.”)).

Contrary to Patent Owner’s argument, Petitioner expressly discusses Butler’s teachings of how the disclosed rear grips—including the pistol-grip handle in Figure 4—are “interchangeable.” Pet. 26. Specifically, Petitioner quotes Butler’s statement that “the loop-shaped grips [such as in the Figure 5 embodiment] may be replaced by any combination of rear grip and foregrip that provide the user with hand positions to ergonomically maneuver the device” and that “[o]ne exemplary variation of the grip construction” is “pistol-grip style rear grip 406.” Ex. 1005, 19:9–12, 19:18–24, *quoted at* Pet. 26. On the current record, Dr. Giachetti’s unrebutted testimony supports that one of ordinary skill in the art reading these passages would have understood Butler’s rear grips as interchangeable. *See* Giachetti Decl. ¶ 111, *cited at* Pet. 26.

Patent Owner also argues that Petitioner’s annotated version of Figure 4 of Butler above “does not show whether the cyclone axis of rotation intersects element 406”—i.e., the “pistol-grip style rear grip” (Ex. 1005, 19:23–24)—because Petitioner improperly identified with purple shading “not only element 406 but also the vacuum body well past element 406.” Prelim. Resp. 22. Patent Owner adds that Petitioner “offers no explanation of why a [person of ordinary skill in the art] would consider the part of the body Petitioner[] indicated in the green parallelogram below to be part of the handle and not part of the body. It is clear that no part of the user’s hand is designed to hold that part of the body”:



Prelim. Resp. 23–24. The annotated version of Figure 4 of Butler above provides the same annotations added by Petitioner to support its positions as to the axis intersects limitations (*see* Pet. 35) and adds a green parallelogram on a portion of the purple shaded “rear grip” identified by Petitioner.

Prelim. Resp. 24.

Here, Patent Owner does not dispute the location of the “axis of rotation” (i.e., the orange dotted line). Instead, Patent Owner assumes that Petitioner argues that the “axis of rotation” intersects the portion of the purple shaded structure within the green parallelogram, which Patent Owner contends would not have been identified as part of the “pistol grip handle” by one of ordinary skill in the art. *See* Prelim. Resp. 23 (“Without the shading that extends well beyond any reasonable interpretation of element 406, the Petition fails to show that Butler discloses a cyclonic separator axis of rotation intersecting a pistol grip handle.”). On the current record, however, the “axis of rotation” represented by the orange dotted line in the above annotated figure could reasonably be seen as intersecting the portion

of the identified “pistol grip handle” *not* in Patent Owner’s green parallelogram. *See* Prelim. Resp. 24. If the evidence further developed at trial continues to support that view, whether or not the structure in Patent Owner’s green parallelogram would be considered part of a “pistol grip handle” is irrelevant. Moreover, on the current record, Patent Owner’s statements as to what precise structure(s) in Figure 4 of Butler one of ordinary skill in the art would have identified as the “pistol grip handle” are mere attorney argument, unsupported by declaration testimony or other evidence as to the understanding of one of ordinary skill in the art on the relevant issue. *See Elbit Sys.*, 881 F.3d at 1359.

Further, Petitioner’s declarant, Dr. Giachetti, provides unrebutted testimony *directly contrary* to Patent Owner’s position, with Dr. Giachetti expressly identifying *the entirety* of the purple structure as the “pistol grip handle.” *See* Giachetti Decl. ¶ 109 (testifying that one of ordinary skill in the art “would have understood that Butler teaches a pistol grip handle” and providing an annotated version of Figure 4 of Butler with a “rear grip” shown in purple shading), *cited at* Pet. 26.

On the current record, we determine that Petitioner has made a sufficient showing that the proposed combination of Butler and Jianan discloses the subject matter of the axis intersects limitations in claims 1 and 9.

*c. Conclusion as to Independent Claims 1 and 9*

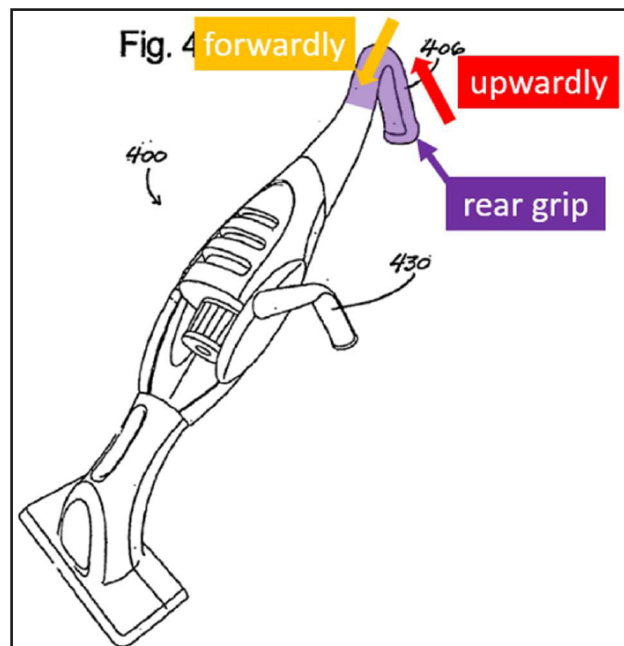
Patent Owner does not offer any arguments specifically addressing the remaining limitations of claims 1 and 9. *See* Prelim. Resp. 7–27. We have reviewed Petitioner’s contentions with respect to the remaining limitations of claims 1 and 9, and we determine that the Petition provides a sufficient

showing, at this stage of the proceeding, that the combination of Butler and Jianan satisfies each limitation.

For the reasons above, we determine, based on the current record, that the Petition shows a reasonable likelihood that Petitioner would prevail in demonstrating that claims 1 and 9 would have been obvious based on Butler and Jianan.

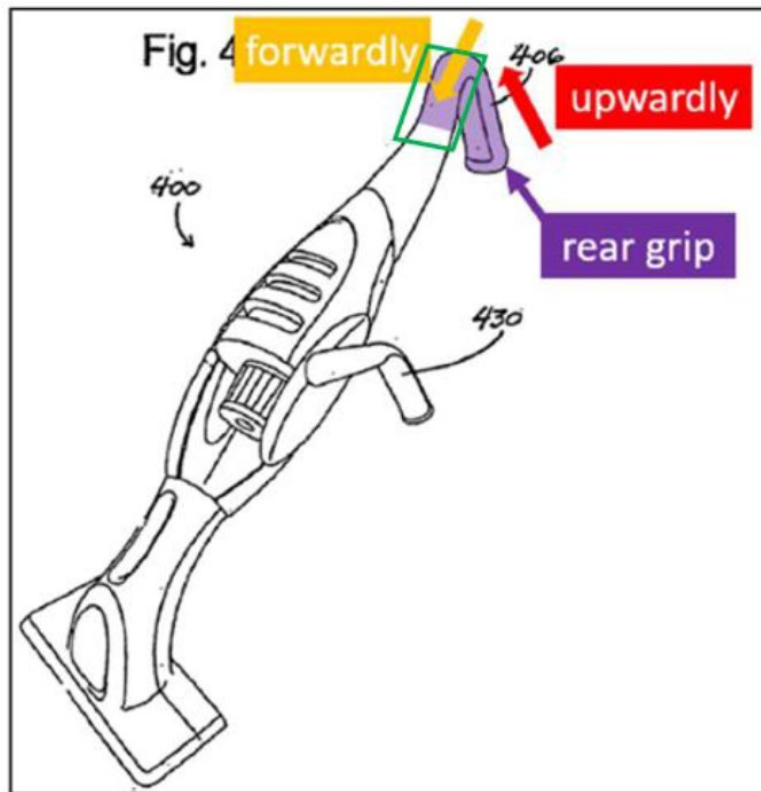
*d. The Handle Extends Limitations in Claims 10 and 15*

The handle extends limitations in independent claims 10 and 15 each recite that “the pistol grip handle . . . extends upwardly and forwardly when the hand vacuum cleaner is positioned with the front end forward of the rear end.” Ex. 1001, 53:59–63, 55:13–17. To address these limitations, Petitioner relies on Butler. Pet. 28–29 (citing Giachetti Decl. ¶¶ 117–118). Specifically, Petitioner states that “[w]hen Butler’s hand vacuum cleaner front end is forward of the rear end, the ‘pistol-grip style rear grip 406’ extends upwardly and forwardly,” with Petitioner providing this annotated version of Figure 4 of Butler:



Pet. 28–29 (quoting Ex. 1005, 19:23–24) (citing Ex. 1005, Fig. 4; Giachetti Decl. ¶ 118). In the annotated version of Figure 4 of Butler here, Petitioner added (1) a purple text box and purple shading identifying a “rear grip,” (2) a red text box and red arrow identifying the portion of the grip extending “upwardly,” and (3) an orange text box and orange arrow identifying the portion of the grip extending “forwardly.” *Id.*

Patent Owner argues that Petitioner has failed to show that the combination of Butler and Jianan satisfies the handle extends limitations in claims 10 and 15. *See* Prelim. Resp. 24–27. Specifically, Patent Owner contends that “[t]he vacuum cleaner in Butler’s Figure 4 . . . is not shown at an angle that indicates whether element 406 extends upwardly in the forward direction” and that “Petitioner[] attempt[s] to overcome Butler’s ambiguity by again shading an area well beyond any reasonable definition of what a pistol grip handle is, extending onto the body of the vacuum, in order to argue that the handle extends upwardly.” *Id.* at 25. Patent Owner then repeats the same argument discussed above—as to the axis intersects limitation—that “the portion of the body in the green parallelogram below is well beyond what could be considered the pistol grip handle”:



Prelim. Resp. 26. The annotated version of Figure 4 of Butler above provides the same annotations added by Petitioner to support its positions as to the handle extends limitations (*see* Pet. 29) and adds a green parallelogram on a portion of the purple shaded “rear grip” identified by Petitioner. Prelim. Resp. 26.

Here, both Petitioner and Patent Owner present arguments that rely on implicit claim construction positions as to the scope of the handle extends limitations, including, for example, the proper meaning of “forwardly” in the context of claims 10 and 15. During trial, the parties may wish to further develop these issues.

On the current record and in view of our decision to institute based on claims 1 and 9 in the context of this ground (*see* § II.C.3.c), we reach no conclusion as to whether Petitioner has made a sufficient showing that the

proposed combination of Butler and Jianan satisfies the handle extends limitations in claims 10 and 15.

*e. Conclusion as to Independent Claims 10 and 15*

Because the Petition shows a reasonable likelihood that Petitioner would prevail with respect to at least one of the challenged claims based on at least one of the asserted grounds (*see* § II.C.3.c), we include claims 10 and 15 in the context of this asserted ground in the instituted *inter partes* review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

*4. Dependent Claims 2–7 and 11–13*

For dependent claims 2–7 and 11–13, Petitioner contends that the proposed combination of Butler and Jianan satisfies each limitation. Pet. 69–77. Patent Owner does not present any arguments specifically addressing claims 2–7 and 11–13 in the context of this asserted ground. *See* Prelim. Resp. 7–27. We include claims 2–7 and 11–13 in the context of this asserted ground in the instituted *inter partes* review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

*D. Asserted Obviousness of Claims 1–7, 9–13, and 15 Based on IPVG and Conrad335*

Petitioner asserts that claims 1–7, 9–13, and 15 of the challenged patent would have been obvious based on IPVG and Conrad335. Pet. 2, 78–133. Patent Owner provides arguments addressing this asserted ground. Prelim. Resp. 27–36. We first summarize aspects of the prior art.

### 1. Overview of IPVG

IPVG discloses a “portable dust suction apparatus of the enclosed dust bag type.” Ex. 1007, 1:10–12. Figure 1 of IPVG is reproduced below:

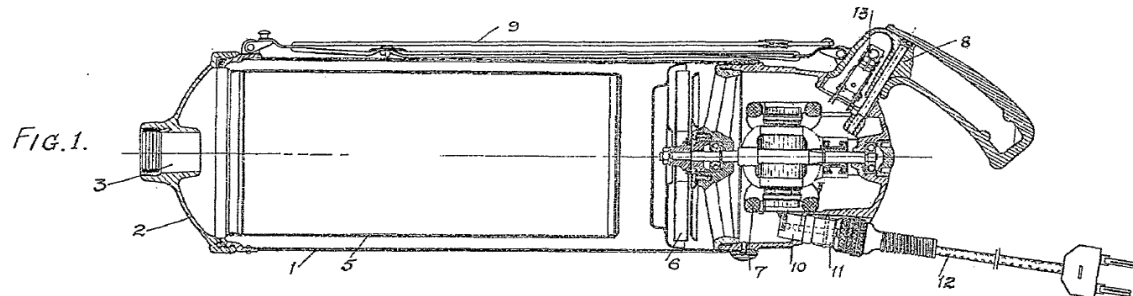


Figure 1 is a longitudinal sectional view of the portable dust suction apparatus. Ex. 1007, 1:45–46. The depicted apparatus includes casing 1, closed off at the front end by screwed cover 2, which includes suction opening 3 for taking in dirt and debris to dust bag 5. *Id.* at 1:51–57. Fan 6, driven by electric motor 7, generates air flow through the apparatus, which exits to the right in the configuration shown, near handle 8. *Id.* at 1:55–62.

Figure 2 is reproduced below:

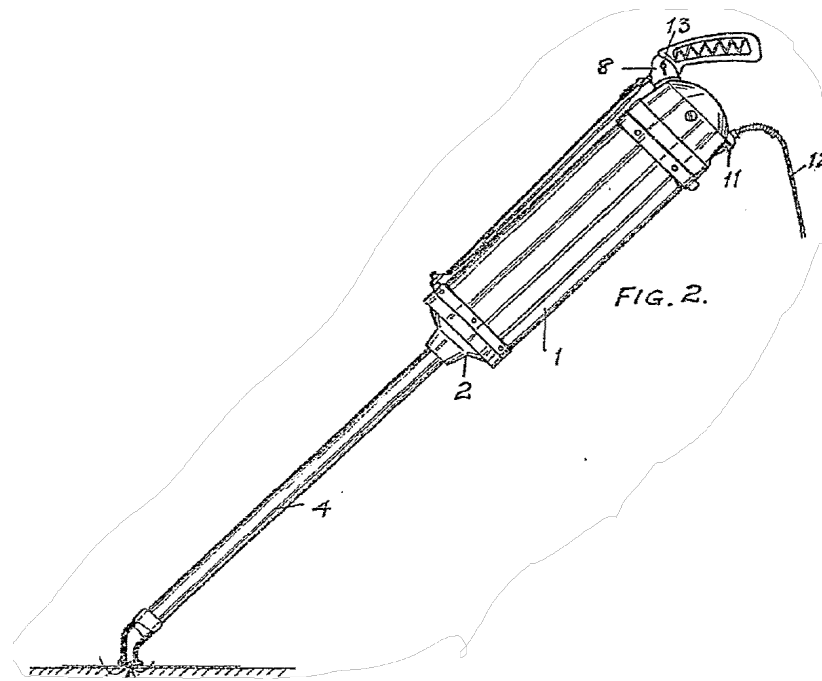
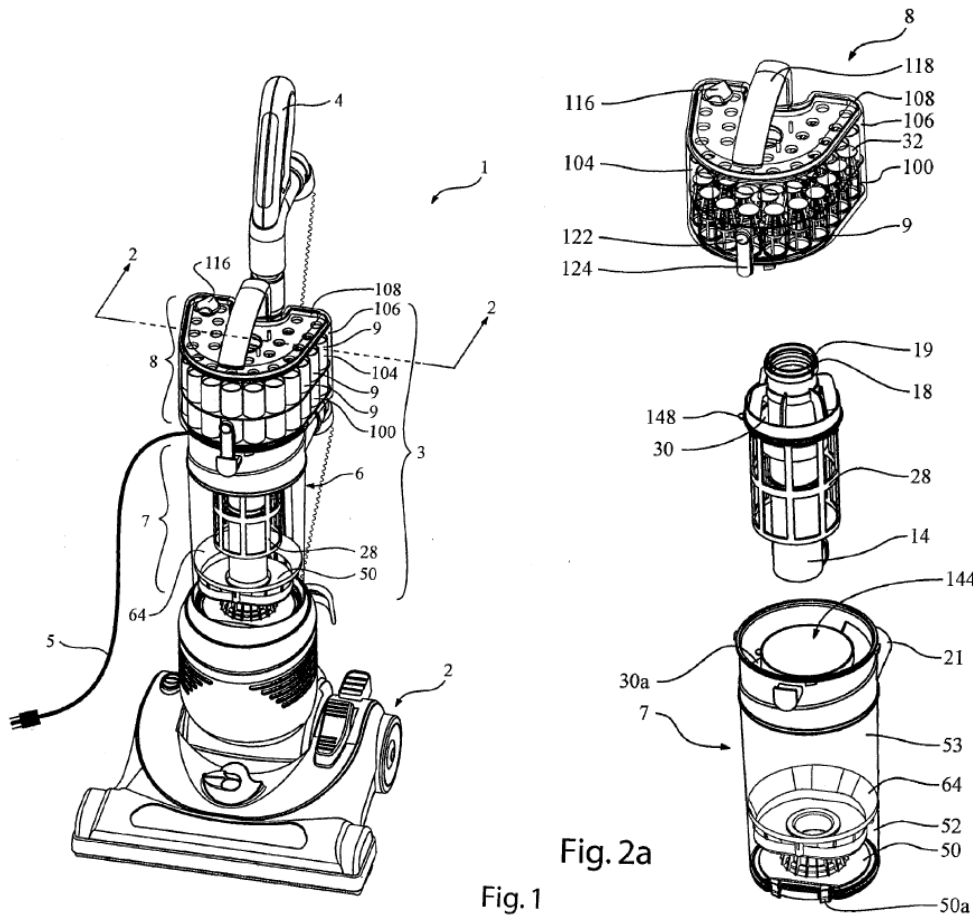


Figure 2 is a side elevation view of the apparatus in use. Ex. 1007, 1:47–48. The apparatus shown here includes suction pipe 4, added to convey dirt and debris up towards suction opening 3. *Id.* at 1:51–55.

## 2. Overview of Conrad335

Conrad335 discloses a vacuum cleaner “that has a plate to divide a dirt collection chamber from a cyclone chamber” and that may also have a “plurality of cyclonic stages.” Ex. 1008 ¶ 1.

Figures 1 and 2a of Conrad335 are reproduced below:



Ex. 1008 ¶¶ 234, 236. Upright vacuum cleaner 1 in Figure 1 includes

ground engaging head 2, main casing 3, and handle 4. *Id.* ¶ 274. “Main casing 3 has a cyclonic cleaning unit 6 comprising a first cyclonic cleaning stage 7 comprising a single cyclone and a second cyclonic cleaning stage 8 comprising a plurality of cyclones 9 in parallel.” *Id.* Cyclonic cleaning stage 7 includes cyclone chamber 53 separated from dirt collection chamber 52 by a plate. *Id.* ¶¶ 297, 318, 338. Floor 50 is shown pivotally mounted to pivot hinge 50a to allow removal of the particles in dirt collection region 52. *Id.* ¶ 338.

### *3. Independent Claims 1, 9, 10, and 15*

For independent claims 1, 9, 10, and 15, Petitioner contends that the proposed combination of IPVG and Conrad335 discloses each limitation. Pet. 78–123. Patent Owner challenges Petitioner’s articulated reasons to combine IPVG and Conrad335 as proposed. *See* Prelim. Resp. 27–36.

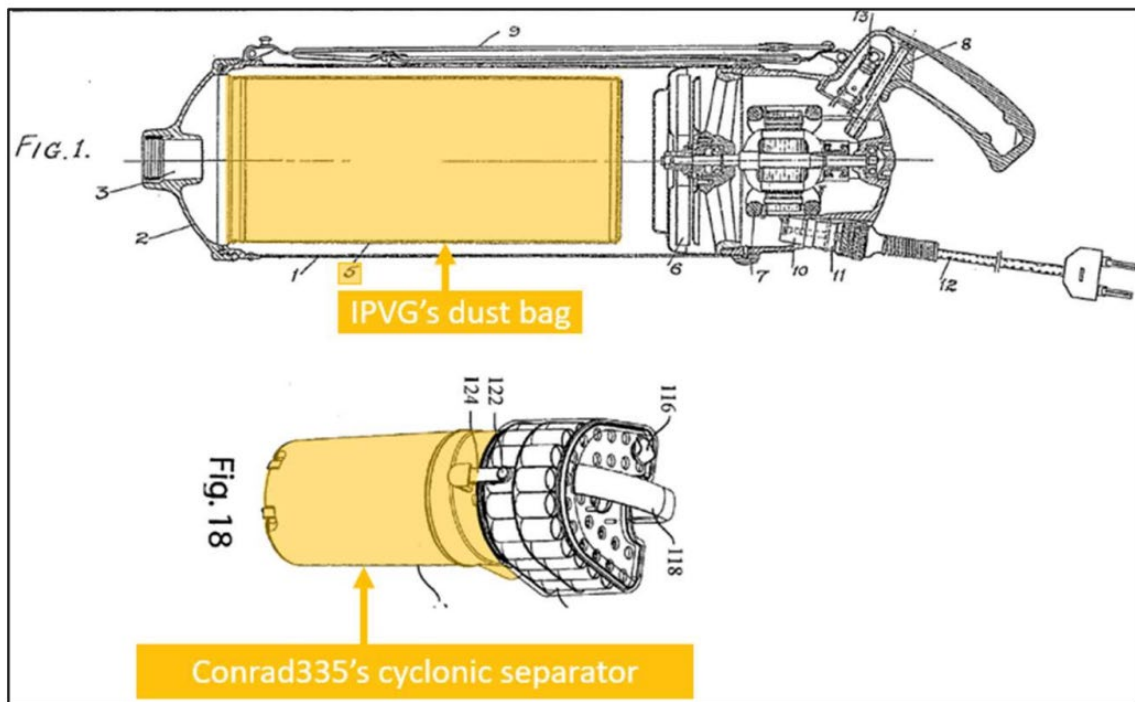
#### *a. The Combination of IPVG and Conrad335*

Petitioner asserts that one of ordinary skill in the art would have been motivated to combine IPVG and Conrad335 as proposed, with a reasonable expectation of success. *See* Pet. 78–92. Specifically, Petitioner first summarizes the dust-collection design of the handheld vacuum cleaner in Figures 1 and 2 of IPVG (as provided above (*see* § II.D.1)). Pet. 78–79. Then, Petitioner summarizes the dust-collection design of the cyclone separator in Figures 1 and 2a of Conrad335 (as provided above (*see* § II.D.2)). Pet. 79–80.

As to the motivation to combine IPVG and Conrad335, Petitioner states that one of ordinary skill in the art “would have been motivated to modify IPVG to achieve the stated benefits of Conrad335’s cyclonic-

separation system and hinged door.” Pet. 81 (citing Giachetti Decl. ¶¶ 239–249). Petitioner then describes three features of the proposed combination.

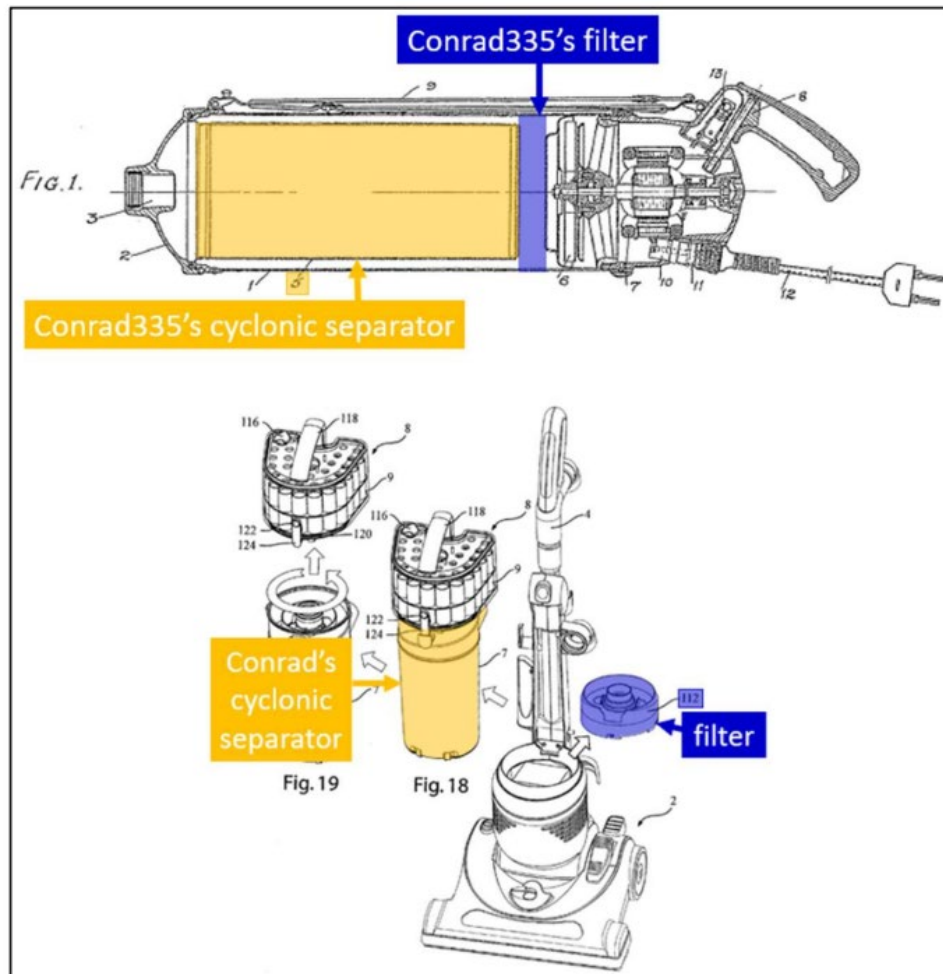
As the first feature, Petitioner states that one of ordinary skill in the art “would have been motivated to modify IPVG’s dust-separation unit (‘dust bag 5’) to use a cyclonic-filtration unit, such as Conrad335’s ‘cyclone separator,’” with Petitioner providing this annotated composite image:



Pet. 81–82 (citing Ex. 1007, Fig. 1; Ex. 1008, Fig. 18; Giachetti Decl. ¶ 240). In the annotated composite image above, Petitioner added (1) an orange text box and orange shading identifying element 5 in Figure 1 of IPVG as “IPVG’s dust bag” and (2) an orange text box and orange shading identifying structure in Figure 18 of Conrad335 as “Conrad335’s cyclonic separator.” Pet. 81.

Second, Petitioner states that when making the modification discussed above as the first feature, one of ordinary skill in the art “would have been further motivated to include a pre-motor filter positioned downstream of the

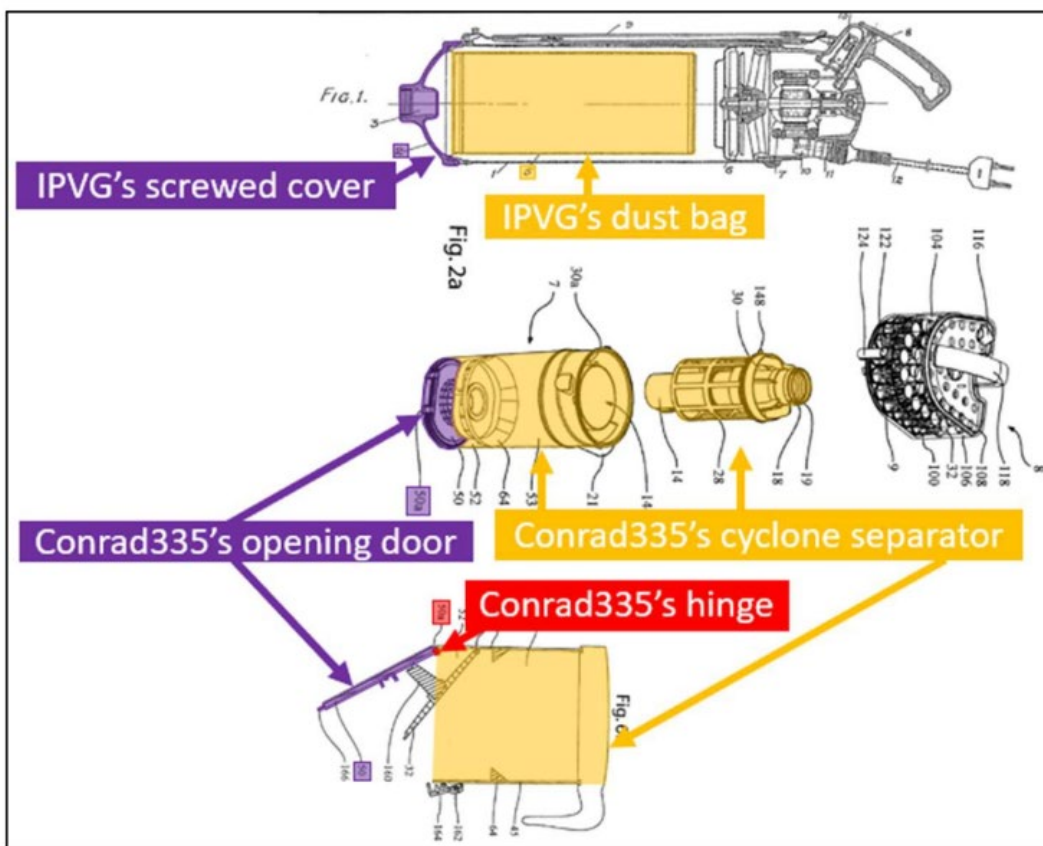
cyclonic separator, such as Conrad335's pre-motor 'filter 112,'" with Petitioner providing this annotated composite image:



Pet. 82 (citing Ex. 1007, Fig. 1; Ex. 1008 ¶ 373, Figs. 18–19; Giachetti Decl. ¶ 241). In the annotated composite image above, Petitioner added (1) an orange text box and orange shading identifying a structure in Figure 1 of IPVG as “Conrad335’s cyclonic separator,” (2) a blue text box and blue shading identifying a structure in Figure 1 of IPVG as “Conrad335’s filter,” (3) an orange text box and orange shading identifying a structure in Figure 18 of Conrad335 as “Conrad’s cyclonic separator,” and (4) a blue text box

and blue shading identifying element 112 in Figure 18 of Conrad335 as a “filter.” Pet. 82.

Third, Petitioner states that one of ordinary skill in the art “would have been motivated to modify IPVG’s screwed-open door (‘screwed cover 2’) to use a pivot-open door, such as Conrad335’s ‘opening door 50’ with ‘pivot hinges 50a,’” with Petitioner providing this annotated composite image:



Pet. 82–83 (citing Ex. 1007, Fig. 1; Ex. 1008, code (57), ¶ 23, ¶ 339, Fig. 2a, Fig. 6h; Giachetti Decl. ¶ 242). In the annotated composite image above, Petitioner added (1) a purple text box and purple shading identifying element 2 in Figure 1 of IPVG as “IPVG’s screwed cover,” (2) an orange text box and orange shading identifying element 5 in Figure 1 of IPVG as “IPVG’s dust bag,” (3) a purple text box and purple shading identifying

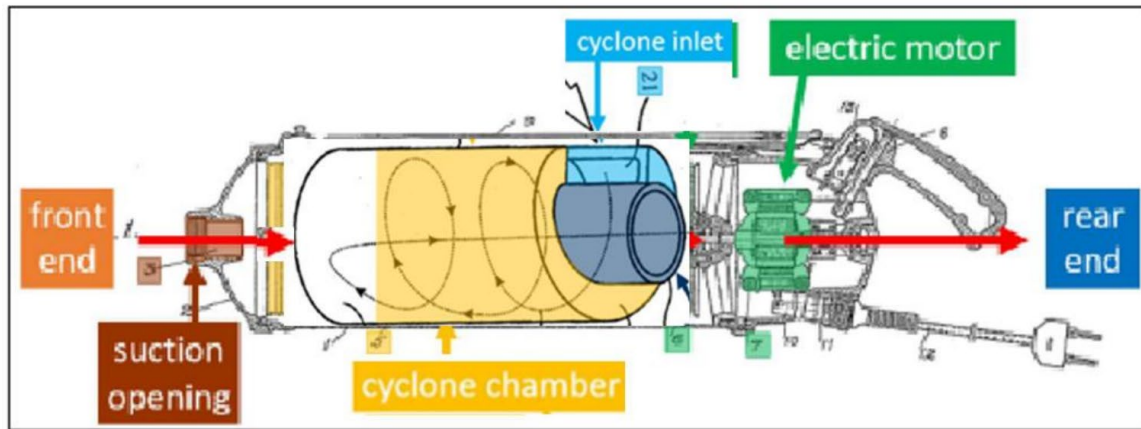
structures in Figures 2a and 6h of Conrad335 as “Conrad335’s opening door,” (4) an orange text box and orange shading identifying structures in Figures 2a and 6h of Conrad335 as “Conrad335’s cyclone separator,” and (5) a red text box and red shading identifying element 50a Figure 6h of Conrad335 as “Conrad335’s hinge.” Pet. 83.

Petitioner then explains the reasons that one of ordinary skill in the art would have combined IPVG and Conrad335 as described: (1) IPVG and Conrad335 are analogous art to the claimed invention; (2) IPVG and Conrad335 provide express motivation for the combination; (3) the claimed location of a pre-motor filter has certain known benefits; (4) Conrad335’s hinged opening door 50 has certain benefits over IPVG’s screwed cover 2; (5) the “combination would have involved a simple substitution of known elements for others to obtain predictable results”; and (6) “it would have been at least obvious to try th[e] combination.” Pet. 83–88. Finally, Petitioner argues that one of ordinary skill in the art would have had a reasonable expectation of success in the proposed combination. Pet. 88–92.

Patent Owner argues that one of ordinary skill in the art would not have combined IPVG and Conrad335 to arrive at the first feature described above—i.e., modifying IPVG’s dust-separation unit (“dust bag 5”) to use a cyclonic-filtration unit, such as Conrad335’s cyclone separator. *See* Prelim. Resp. 27–36. For the reasons discussed below, the current record supports Patent Owner’s argument.

As argued by Patent Owner “all of the cited Conrad335 cyclonic separators have their *clean air inlets on the rear end of the cyclone separator*—opposite the front end of the cyclone separator, which is positioned at the inlet of the IPVG vacuum.” Prelim. Resp. 30. To illustrate

this point, Patent Owner provides this composite image with the cyclone separator from Figure 3 of Conrad335 in the location of dust bag 5 in the hand vacuum cleaner of Figure 1 of IPVG:



Prelim. Resp. 31 (citing Ex. 1007, Fig. 1 (modified); Ex. 1008, Fig. 3 (modified)). In the annotated composite image above, there is (1) an orange text box identifying a “front end” of the hand vacuum cleaner, (2) a brown text box and arrow identifying element 3 in Figure 1 of IPVG as a “suction opening,” (3) an orange text box and orange shading identifying a “cyclone chamber” in Figure 3 of Conrad335, (4) gray shading on a fluid outlet in the identified “cyclone chamber,” (5) a light blue text box and light blue shading identifying a “cyclone inlet” in Figure 3 of Conrad335, (6) a green text box and green shading identifying an “electric motor” in Figure 1 of IPVG, (7) a dark blue text box identifying a “rear end” of the hand vacuum cleaner, and (8) red arrows showing a general flow path of air from left to right. Prelim. Resp. 31.

Patent Owner argues—and the current record supports—that “the cyclone inlet is not located adjacent to or near the air inlet coming in from the suction opening at the front end of the IPVG vacuum.” Prelim. Resp. 31 (emphasis omitted). We also agree with Patent Owner that the current

record supports that the other cyclonic separators in Conrad335 have the same general configuration, with the dirt collection chamber on the front end and both the inlet and outlet at the rear end. *See id.* at 31–33 (discussing Ex. 1008, Fig. 3, 2a, 6g). The current record supports Patent Owner’s view that “Conrad335’s cyclonic separators are designed to have cyclonic flow proceed in a direction through the chamber, impact the wall, and then reverse back so that the air flow exits at the same end it entered.” *Id.* at 32.

Patent Owner adds—and the current record supports—that “Petitioner[’s] insertion of the Conrad335 cyclone chambers into the IPVG vacuum presents no way for the air coming into the IPVG vacuum to reach the inlet of the Conrad335 cyclone chamber.” Prelim. Resp. 33. Stated differently, and with reference to the previous composite image (*see* Prelim. Resp. 31), neither Petitioner nor Dr. Giachetti has adequately explained on the current record how dirty air entering through the suction opening on the left side of the composite image gets to the light blue cyclone inlet for cyclonic separation. As argued by Patent Owner, Petitioner “offers no evidence regarding how such a change would be made, and in fact does not even acknowledge that such a change would be necessary.” *Id.* at 36.

On the current record and in view of our decision to institute based on another ground (*see* § II.C.3.c), we reach no conclusion as to whether Petitioner has made a sufficient showing that one of ordinary skill in the art would have had reason to combine IPVG and Conrad335 as proposed and with a reasonable expectation of success.

*b. Conclusion as to Claims 1, 9, 10, and 15*

Because the Petition shows a reasonable likelihood that Petitioner would prevail with respect to at least one of the challenged claims based on

at least one of the asserted grounds (*see* § II.C.3.c), we include claims 1, 9, 10, and 15 in the context of this asserted ground in the instituted *inter partes* review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

#### 4. *Dependent Claims 2–7 and 11–13*

For dependent claims 2–7 and 11–13, Petitioner contends that the proposed combination of IPVG and Conrad335 satisfies each limitation. Pet. 123–133. Patent Owner does not present any arguments specifically addressing these claims in the context of this asserted ground. *See Prelim. Resp.* 27–36. We include claims 2–7 and 11–13 in the context of this asserted ground in the instituted *inter partes* review. *See SAS*, 138 S. Ct. at 1354, 1359–60; 37 C.F.R. § 42.108(a).

### III. CONCLUSION

For the reasons above, we determine that the Petition shows a reasonable likelihood that Petitioner would prevail with respect to at least one of challenged claims 1–7, 9–13, and 15 of the challenged patent. At this stage of the proceeding, no final determination has yet been made with regard to the patentability of any of the challenged claims or any underlying factual or legal issues, including the construction of claim terms. The final determination will be based on the record as developed during the *inter partes* review.

### IV. ORDER

Accordingly, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review is hereby instituted as to claims 1–7, 9–13, and 15 of the challenged patent on all asserted grounds and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, *inter partes* review shall commence on the entry date of this Decision, with notice hereby given of the institution of a trial.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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DYSON TECHNOLOGY LIMITED and DYSON, INC.,  
Petitioner,

v.

OMACHRON INTELLECTUAL PROPERTY INC.,  
Patent Owner.

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IPR2024-01162  
Patent 11,903,546 B2

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DOUGAL, *Administrative Patent Judge, dissenting.*

I. SUMMARY

For the reasons discussed below, I respectfully dissent from the decision to institute *inter partes* review.

At the same time, I agree with the Majority's analysis of claims 10 and 15 for the Butler and Jianan obviousness ground, and the analysis of the IPVG and Conrad335 obviousness ground. *See supra* §§ II.C.3.d & II.D. Based on this analysis, I would determine that the Petition does not show a reasonable likelihood of success with respect to claims 10–13 and 15 as obvious under Butler and Jianan, and claims 1–7, 9–13, and 15 as obvious under IPVG and Conrad335.

## II. ANALYSIS

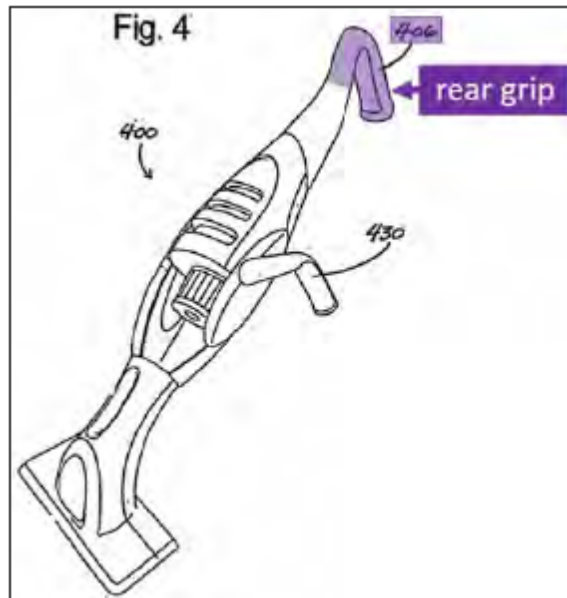
### *A. Asserted Obviousness of Claims 1–7 and 9 Based on Butler and Jianan*

Independent claims 1 and 9 require: “a pistol grip handle” and “[a] cyclone axis of rotation [that] intersects the pistol grip handle.” Ex. 1001, 51:7, 52:1–2, 53:17, 53:29–31.

In order to determine whether “the cyclone axis of rotation intersects the pistol grip handle,” it is necessary to define the extent of the pistol-grip handle, and to determine whether Petitioner has appropriately positioned the cyclone axis of rotation. As Petitioner has done neither, I would determine that the Petition does not provide a basis to determine a reasonable likelihood of success with respect to the noted claims under this ground.

Petitioner argues that “Butler’s hand vacuum cleaner ‘includes a pistol-grip style rear grip 406.’” Pet. 26 (quoting Ex. 1005, 19:22–24). There is no dispute that “Butler’s ‘pistol-grip style rear grip 406’ is a pistol-grip handle.” *Id.*

What is disputed is the boundary of Butler’s pistol-grip style rear grip 406. The Petition does not discuss the boundary, but includes a revised version of Butler Figure 4, reproduced below.



Pet. 26. Butler describes Figure 4 as showing a “vacuum cleaner 400 [that] includes a pistol-grip style rear grip 406, and pistol-grip style foregrips 430 (only one of which is visible).” Ex. 1005, 19:22–24. Petitioner has modified the figure to add (1) a purple text box with the words “rear grip,” and an arrow pointing at a portion of the vacuum, and (2) purple shading covering a portion of the vacuum cleaner. Pet. 26.

Petitioner’s declarant describes the annotations in this figure as showing the “pistol-grip style rear grip 406.” Ex. 1002 ¶ 109. However, neither the Petition, nor Petitioner’s declarant, explain why all of the portion of the vacuum cleaner which they have shaded purple would be understood to be a pistol-grip handle by one of skill in the art.

Patent Owner takes issue with the lack of explanation in the Petition, arguing that Petitioner improperly identified with the purple shading “not

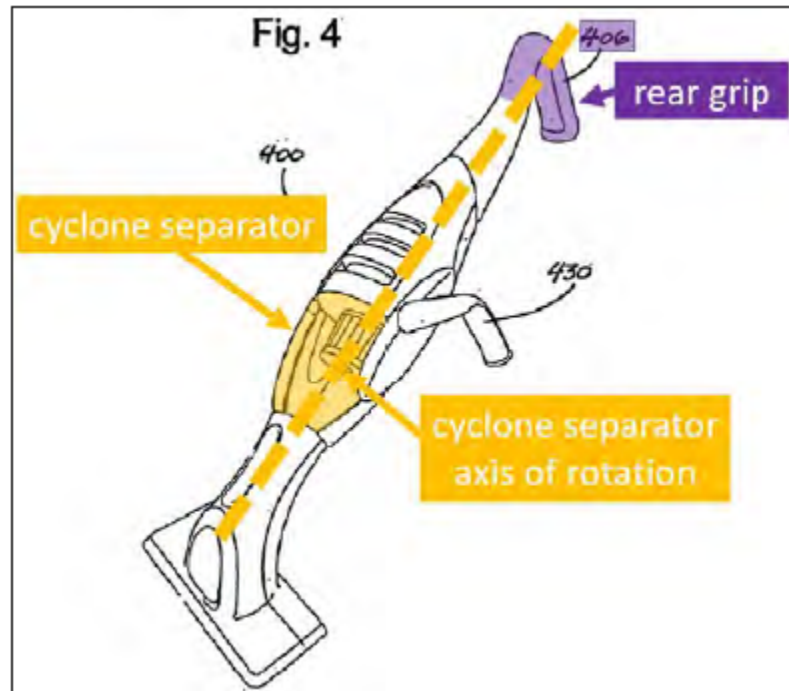
only element 406 but also the vacuum body well past element 406.” Prelim. Resp. 22.

I agree with Patent Owner in this regard. This position by Petitioner does not seem reasonable. By defining the pistol-grip handle to include a portion of the vacuum body, in addition to what would be commonly understood to be a pistol-grip, Petitioner needed to provide an explanation as to why this position is reasonable.

The majority dismisses Patent Owner’s position as mere attorney argument, and states that Petitioner’s position is supported by declarant testimony. *See supra* § II.C.3.b. However, the declarant testimony does not address this point. *See e.g.*, Ex. 1002 ¶¶ 109–110. The only point expressly made concerning the understanding of one of skill in the art is “that Butler teaches a pistol grip handle.” *Id.* ¶ 109. This is not contested. However, the testimony merely asserts that the portion in purple is a pistol-grip handle. *Id.* This testimony is lacking in that it does not say that one of skill in the art would understand the purple portion to be a pistol-grip handle, or explain why it would be considered so. For these reasons, I find Petitioner’s position to be lacking.

Further, no law or rule requires the Board to rely on expert testimony to read the prior art. *See Belden Inc. v. Berk–Tek LLC*, 805 F.3d 1064, 1079 (Fed. Cir. 2015). Whether Butler teaches a pistol-grip handle is easily understandable and does not require expert explanatory testimony. *See Wyers v. Master Lock Co.*, 616 F.3d 1231, 1242 (Fed. Cir. 2010). However, because the shading includes part of the vacuum body that goes beyond what would normally be considered a pistol-grip handle, I would determine that Petitioner’s position requires explanation.

Moving now to the cyclone axis of rotation, Petitioner argues that “Butler teaches the cyclone axis of rotation intersects the pistol-grip handle.” Pet. 34; *see also* Ex. 1002 ¶ 129 (Petitioner’s declarant making an identical statement). Petitioner (Pet. 35) and Petitioner’s declarant (Ex. 1002 ¶ 129) both provide the following annotated version of Butler Figure 4:



Petitioner’s annotations include (1) an orange text box with the words “cyclone separator” and an arrow pointing to orange shading on the vacuum, (2) an orange text box with the words “cyclone separator axis of rotation” and an arrow pointing to a series of ten orange rectangles organized in a line, and (3) a purple text box with the words “rear grip” and an arrow pointing to purple shading on the vacuum.

I first note that both Petitioner and Petitioner’s declarant have reduced the size of Butler Figure 4 by around 50%. Thus, what was once a figure that took up half a page is now significantly smaller. Normally that would not be an issue, but here where we need to determine whether the cyclone

axis of rotation intersects the pistol grip handle, Petitioner has chosen to provide less detail than is present in Butler.

Second, instead of illustrating the axis with a small line weight, Petitioner has chosen to use a series of ten large rectangles positioned in a line.<sup>12</sup> This is in contrast to Petitioner's other annotations. The size of these rectangles is substantially heavier than the line weight of the arrows. Though even the arrows have a substantially heavier line weight than any line in the original version of Butler Figure 4. The added rectangles serve to obscure critical aspects of the Figure, such that it is difficult, if not impossible, to determine whether the axis is positioned or angled appropriately.

These issues, combined with the lack of discussion concerning the boundary of Butler's pistol-grip handle, render it impossible, on this record, to determine whether Butler's "cyclone axis of rotation intersects the pistol grip handle," as required by claims 1 and 9.

Thus, even though Petitioner and Petitioner's declarant both assert that "Butler teaches the cyclone axis of rotation intersects the pistol-grip handle," I am unable to verify whether this is correct or whether Petitioner's position is reasonable. Pet. 34; Ex. 1002 ¶ 129. As such, Petitioner has not satisfied its burden to show a reasonable likelihood of success with respect to claims 1 and 9 as obvious over Butler and Jianan.

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<sup>12</sup> I also note that Butler Figure 4 is a perspective view. We do not have any evidence as to what type of perspective, or how one of skill in the art would interpret this view with respect to the relevant claim limitations.

### III. CONCLUSION

For all above reasons, Petitioner has not satisfied its burden to show a reasonable likelihood of success with respect to any of the challenged claims. Thus, I would not institute *inter partes* review.

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Patent 11,903,546 B2

FOR PETITIONER:

Christian Huehns  
Matthew Benjamin Hershkowitz  
KIRKLAND & ELLIS LLP  
christian.huehns@kirkland.com  
matt.hershkowitz@kirkland.com

FOR PATENT OWNER:

Brian M. Buroker  
Nathan Curtis  
Shuo Josh Zhang  
Vivian Lu  
GIBSON, DUNN & CRUTCHER LLP  
bburoker@gibsondunn.com  
ncurtis@gibsondunn.com  
szhang@gibsondunn.com  
vlu@gibsondunn.com