

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DYSON TECHNOLOGY LIMITED AND DYSON, INC.,
Petitioners,

v.

OMACHRON INTELLECTUAL PROPERTY INC.,
Patent Owner.

Case No. IPR2024-01317
U.S. Patent No. 11,910,983

PATENT OWNER'S PRELIMINARY RESPONSE

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PATENT OWNER'S EXHIBIT LIST

Exhibit	Description
2001	Declaration of Dr. Khalid Sorensen
2002	Comparison of Filter Bag, Cyclonic, and Wet Dust Collection Methods in Vacuum Cleaners, AIHAJ (62) (September/October 2001)
2003	Linden, Investigations into Cyclone Dust Collectors, Proceedings of the Institution of Mechanical Engineers (1949)
2004	Kim et al., Experimental Study of Particle Collection by Small Cyclones, Aerosol Science and Technology (1990)
2005	U.S. Patent No. 10,219,661

TABLE OF ABBREVIATIONS

Abbreviation	Term
'983 Patent	U.S. Patent No. 11,910,983 (Ex1001)
Butler	PCT Publication No. 2007/084543 to Butler et al.
Challenged Claims	Claims 1–16 of U.S. Patent No. 10,219,661
Fig.	Figure
IPR	<i>inter partes</i> review
Jianan	Chinese Patent Publication No. CN101061932
Martelliere	French Patent No. 1,094,603 to Martelliere
Patent Owner	Omachron Intellectual Property Inc.
Petitioners	Dyson Technology Limited and Dyson, Inc.
POSITA	person[s] of ordinary skill in the art
Rebel	German Patent Publication No. 1,680,208

I. INTRODUCTION

Patent Owner Omachron Intellectual Property Inc. provides the following Preliminary Response to the Petition filed by Dyson Technology Limited and Dyson, Inc. requesting *inter partes* review of claims 1–22 of U.S. Patent No. 11,910,983.

Petitioners had the burden of showing that there is a reasonable likelihood that it would prevail with respect to at least one challenged claim. 35 U.S.C. § 314(a). Petitioners did not meet that burden. Although Petitioners nakedly assert that the claims “cobble together well-known configurations and features without solving any technical problems,” Pet., 1, none of Petitioners’ invalidity grounds disclose or render obvious all requirements of any independent claim.

Petitioners first two grounds are based on Butler, which does not disclose the claimed “a pistol grip handle” that is “mounted to an outer wall of the hand vacuum cleaner at a location rearward of the front end and forward of a rear end of the suction motor” and that “is a driving handle for the surface cleaning apparatus.” Butler, in contrast to the ’983 Patent, uses a specific two-handle configuration—a combination of a foregrip and a rear grip—to drive the surface cleaning apparatus. As explained by Patent Owner’s expert, Dr. Sorensen, the foregrips Petitioners point to as the “driving handle” are not intended for driving the surface cleaning apparatus across the surface to be cleaned, and therefore would not be understood to be a “driving handle.” All of Petitioners Grounds based on Butler therefore fail.

Petitioners second two grounds, based on Rebel in combination with Martelliere, fare no better for two independent reasons. First, the Rebel and Martelliere combination does not disclose or render obvious a “surface cleaning head.” For this limitation, Petitioners point to a standard suction nozzle, which the ’983 Patent distinguishes from a “surface cleaning head,” as is claimed. Second, Petitioners failed to establish that a POSITA would have been motivated to modify Rebel’s small and effective vacuum cleaner, designed for cleaning the interior of vehicles, with Martelliere’s cyclonic separation system for a broom vacuum cleaner. Petitioners proposed combination is in direct contradiction to the teachings of both references and ignores the vast differences in sizes, form factors, and intended uses between the two disclosed embodiments, resulting in a combination that a POSITA would never have been motivated to make. For obviousness, a Petition must provide, with particularity, rationale to combine the teachings of the cited art and establish “whether the relevant skilled artisan had a motivation to combine pieces of prior art in the way eventually claimed in the patent at issue.” *Intercontinental Great Brands LLC v. Kellogg N. Am. Co.*, 869 F.3d 1336, 1343 (Fed. Cir. 2017). Petitioners did not provide any such rationale.

For at least these reasons and those set forth below, Petitioners failed to show a reasonable likelihood of success on any Challenged Claim, and the Board should deny institution of IPR.

II. CLAIM CONSTRUCTION

A claim subject to IPR shall be construed using the same standard as in a civil action. 37 C.F.R. § 42.100(b). The Board need only construe terms “to the extent necessary to resolve the controversy.” *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017). At this stage, Patent Owner does not submit any terms for construction. Patent Owner reserves the right to subsequently submit claim terms for construction should the Board institute IPR.

III. LEVEL OF ORDINARY SKILL IN THE ART

Solely for the purpose of this Preliminary Response, Patent Owner does not challenge Petitioners' proposed definition of a POSITA. Patent Owner reserves the right to provide an alternative definition of a POSITA if IPR is instituted.

IV. TECHNICAL BACKGROUND

A. Summary of the '983 Patent

The '983 Patent relates to “the field of surface cleaning apparatus,” and, in particular, to “[a] surface cleaning apparatus compris[ing] a hand vacuum cleaner, a surface cleaning head and a rigid air flow conduit removably mountable between the surface cleaning head air outlet and the dirty air inlet of the hand vacuum cleaner.” Ex1001, Abstract, 1:23–27. According to the '983 Patent, “[h]and vacuum cleaners or handvacs” were known and were “advantageous as they are lightweight and permit above floor cleaning and cleaning in hard to reach locations.” *Id.*, 1:31–46.

As illustrated below, the '983 Patent improves on the prior art by providing a specific configuration and orientation of components, including a cyclone with an axis of rotation with specific orientation, and a pistol grip handle at rear portion of the hand vacuum cleaner. *Id.*, cl. 1; Ex2001, ¶ XX.

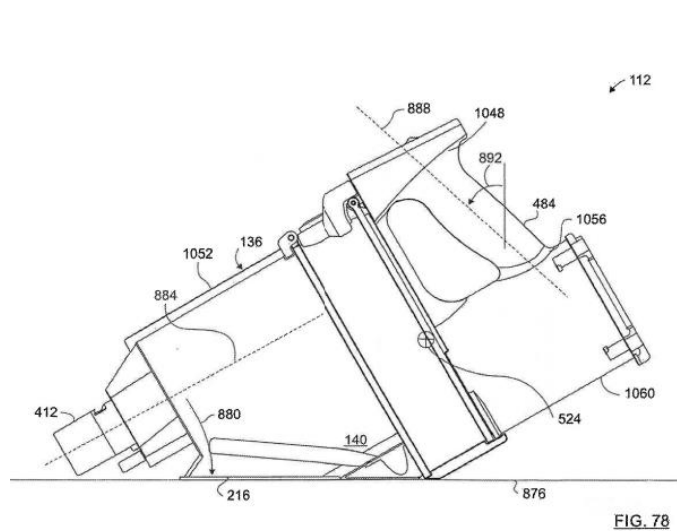


FIG. 78

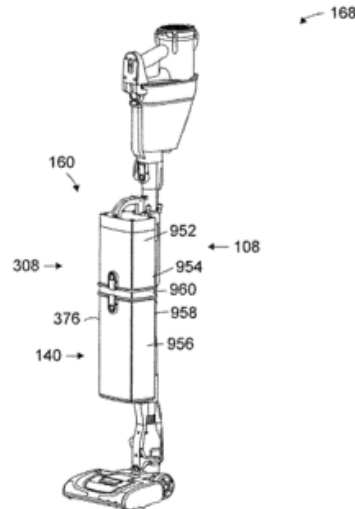


FIG. 82

Id., Figs. 78, 82.

Another relevant embodiment of the '983 Patent is that associated with Figure 21, reproduced below, and the related hand vacuum cleaner of Figure 22. As illustrated below, the cyclone axis 248 of handvac 112 is parallel to the suction motor axis 252, and the configuration is such that the cyclone axis would be generally horizontal if surface cleaning apparatus itself were positioned on a horizontal surface (*i.e.*, with the upper end (*i.e.*, top wall 212) above the lower end (*i.e.*, bottom wall 216). *Id.*, 12:24–13:15, 18:33–44. Additionally, the pistol grip handle is located

toward the rear of the hand vacuum cleaner and is a “driving handle” for the surface cleaning apparatus. *Id.*, 33:16–34:34; see also Ex2001, ¶ XX.

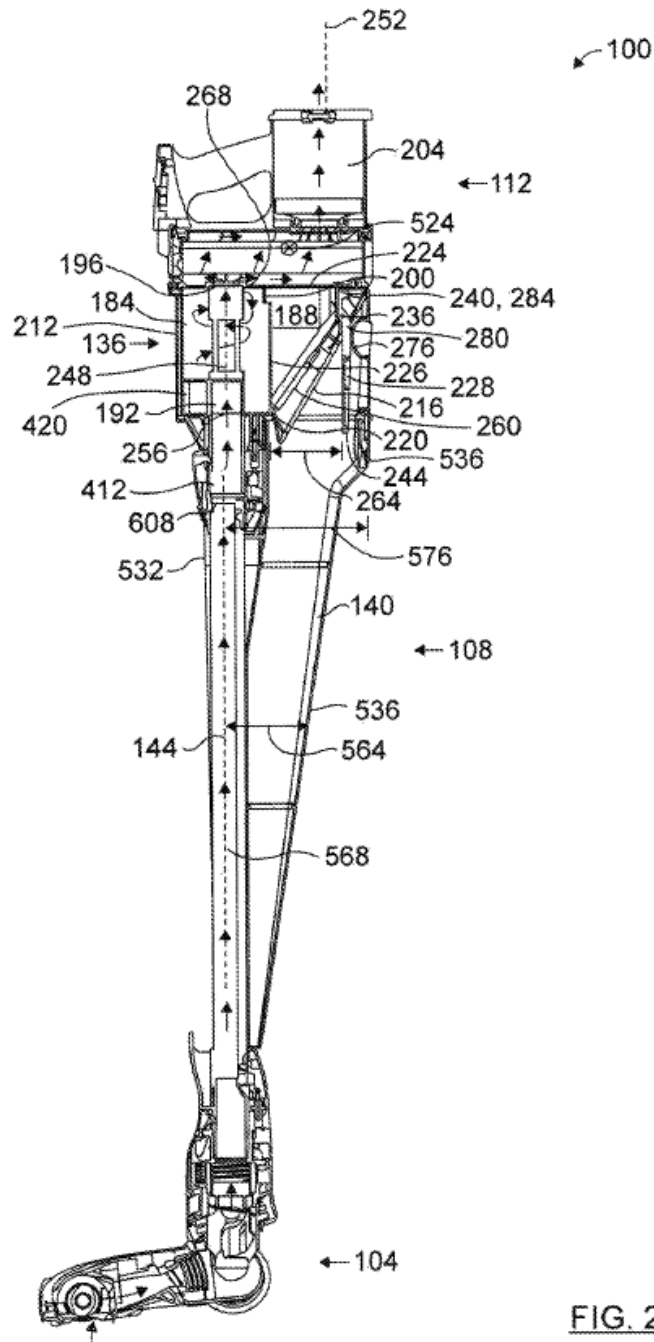
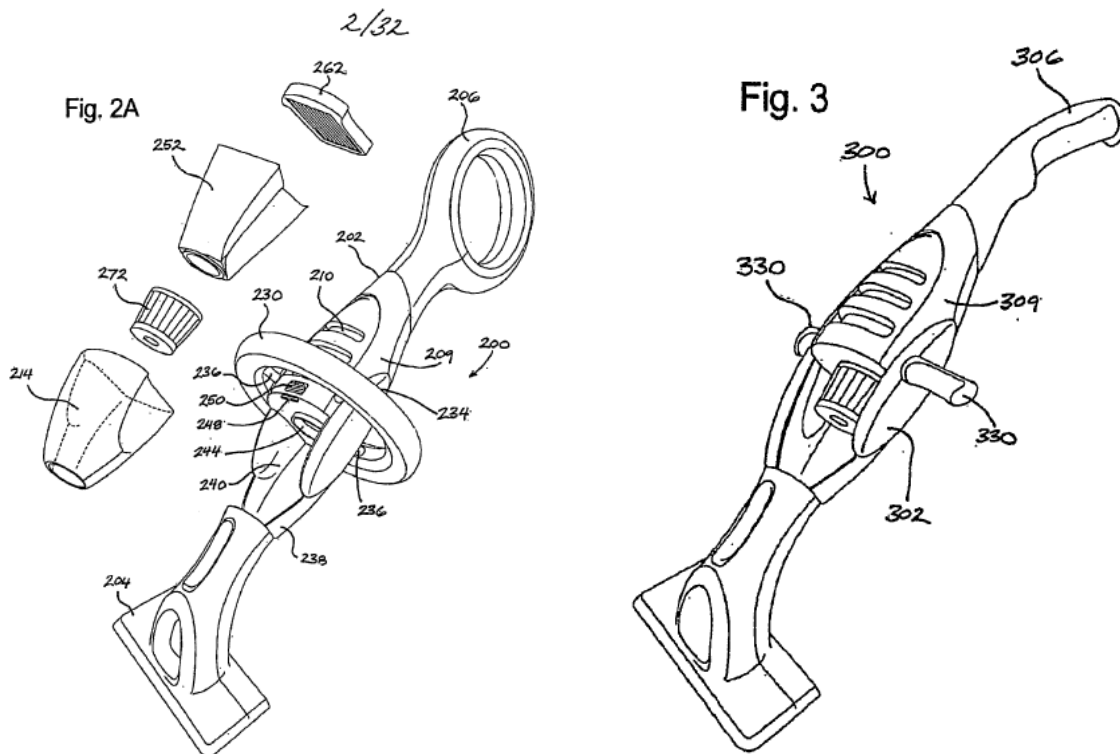


FIG. 21

B. Overview of Asserted References

1. Butler

Butler is a 2007 PCT publication that discloses several distinct embodiments of a specialized “Stair Cleaning Vacuum.” Ex1005, Title. Butler discusses various existing solutions such as “upright and canister vacuum cleaners,” “stick vacuums,” and “compact hand-held vacuums,” and concludes that there “exists a need for an improved vacuum cleaner” specifically adapted for cleaning “raised” surfaces, and “particularly stair treads and risers.” *Id.*, 1:5–24, 3:10–16. Two distinct embodiments from Butler—one associated with Figure 2A and the other with Figure 3—are shown below, each having a very different handle configuration.



Id., Figs. 2A, 3.

2. Rebel

Rebel is a 1971 German patent publication directed to a “[m]ultipurpose device” for “handheld vehicle care,” which includes “a motor-driven vacuum cleaner,” “a tool drive, for example for a polishing brush,” and “a water pump connected or connectable to the drive of the vacuum cleaner.” Ex1007, 2. Thus, with a single tool that “does not require a great deal of storage space,” a user can vacuum, spray, and polish a vehicle. *Id.*

As illustrated below, the “pistol-shaped housing 11” includes a handle 13 and electric motor 14 connected to a suction fan 20. *Id.*, 5, Fig. 1. The vacuum feature of the device functions to “suck in the air and the dust through the suction nozzle 21 and the suction connection 22.” *Id.*, 5. It uses a “dust bag 23” to achieve separation of dust and air, with the dust bag “detachably attached to the suction connection 22 and can be removed from the housing 11 together with said connection.” *Id.*

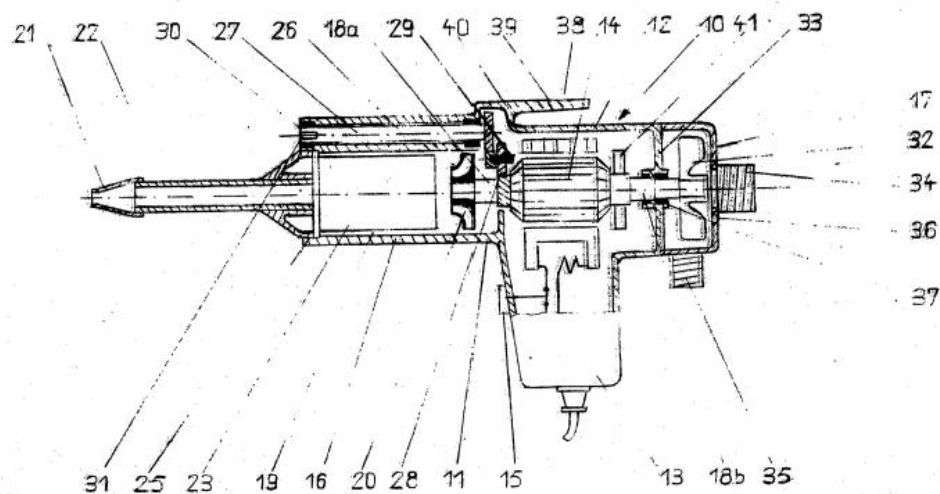
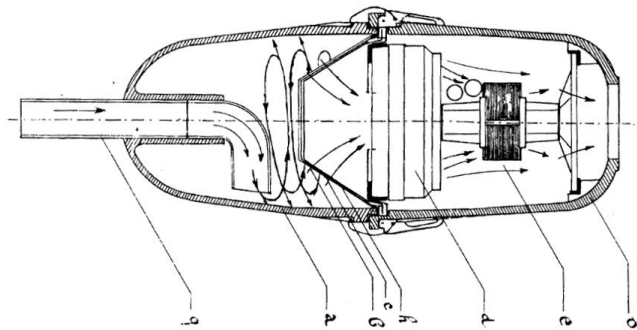


Fig.1

3. Martelliere

Martelliere is a 1955 French patent for an improvement to a “broom type vacuum cleaner model” that addresses the “recognized difficulty” of emptying dust bags by “replacing fabric [dust] bags” with a container made of “smooth and transparent material.” Ex1009, 1. This transparency allows a user to see how full the dust container is to “better judge when it must be emptied” and to “even see a lost object sucked up by the device and recover it.” *Id.*



V. SPECIFIC GROUNDS OF UNPATENTABILITY

A. Petitioners Failed to Show that Butler Renders Obvious Challenged Claims 1–2, 4–10, 12–15, and 17–21 (Ground 1)

The '983 Patent discloses and claims a specific configuration and arrangement of components of a hand vacuum cleaner, including (as relevant here) “a pistol grip handle” that is “mounted to an outer wall of the hand vacuum cleaner at a location rearward of the front end and forward of a rear end of the suction motor” and that “is a driving handle for the surface cleaning apparatus.” Ex1001, cls. 1, 12. Butler

does not disclose or render obvious the “pistol grip handle” limitations of the two independent claims 1 and 12.

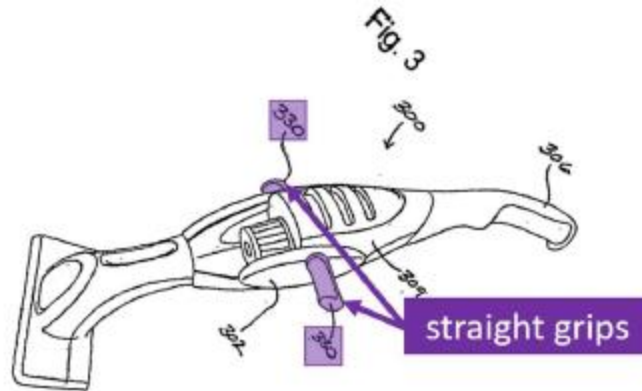
Butler discloses multiple embodiments of a vacuum cleaner specifically adapted for cleaning in stairwells and other confined spaces. Ex1005, 1:2–3. To achieve this objective, each embodiment of Butler has a two-handle configuration specific to that embodiment, with each embodiment having “a rear grip” located at one end and a different “foregrip configuration” located between the rear grip and the front air inlet. *Id.*, 3:20–4:1. Petitioners rely on two specific embodiments of the “foregrip” of Butler as meeting the “pistol grip handle”: foregrips 330 (from the Figure 3 embodiment) and 430 (from the Figure 4 embodiment). Pet., 24–25. Petitioners (rightfully) do not argue that any of Butler’s “looped” foregrips meet the “pistol grip handle” limitations.

As explained below, Petitioners are incorrect that either foregrips 330 or 430 meet or render obvious the claimed requirements of the “pistol grip handle,” including that it is a “driving handle.”

1. Butler Does Not Disclose the Claimed “Pistol Grip Handle” Is a “Driving Handle” ([1c.2], [1c.4], [12c.1.ii], [12c.2])

a. Foregrips 330 of Figure 3 are not a “pistol grip handle”

Petitioners first argue that straight grips 330 of Butler’s Figure 3 embodiment, shown below with Petitioners’ annotations, are “pistol grip handles.” Pet., 20. Petitioners are incorrect.

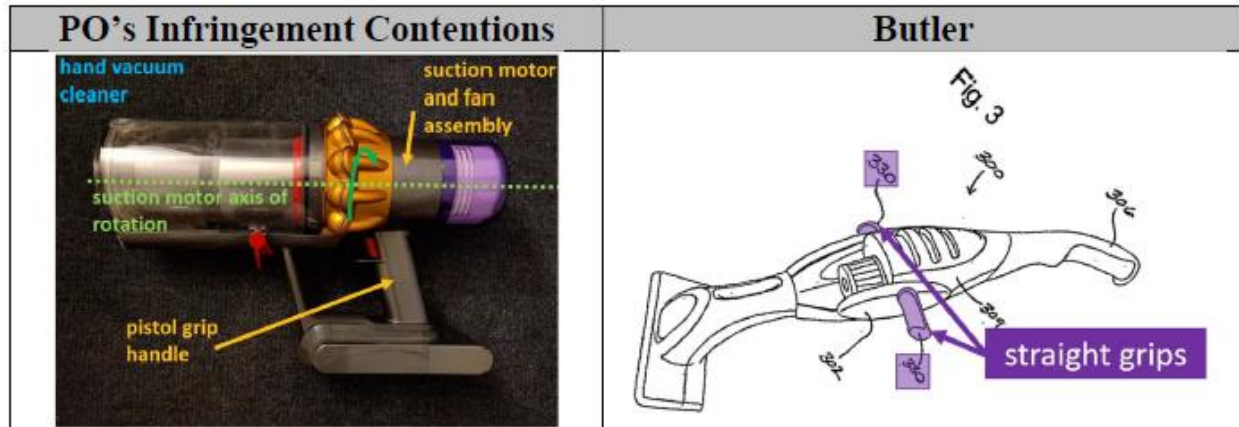


Pet., 20 (Ex1005, Fig. 3 as annotated by Petitioners).

Butler explains that “straight grips 330” “extend generally radially from the vacuum cleaner housing.” Ex1005, 19:18–22. A POSITA would not consider such handles, extending generally horizontally, to be “pistol grip handles.” Ex2001, ¶ 75. As explained by Patent Owner’s expert, Dr. Sorensen, “[p]istol-grips are handles that are shaped like a pistol stock” or otherwise “exhibit[] characteristics of a pistol stock,” such as “extending downward from the main body of the device to which it is attached.” *Id.* Because straight grips 330 extend laterally *outward* from the body, “and not down in any way like one would observe with the grip of a pistol,” a POSITA would not consider them to be the claimed “pistol grip handle.” *Id.*, ¶ 76. Indeed, Butler does not refer to straight grips as “pistol grip” handles, even though Butler refers to other grips in the reference as “pistol grips.” See Ex1005 at 19:23–24 (“pistol-grip style rear grip 406, and pistol-grip style foregrips 430”).

Petitioners do not present any evidence that straight grips 330 are “pistol grip handles.” See Pet., 19–20; Ex1002, ¶ 112. Rather, relying on the comparison of

images below, Petitioners argue that “a POSA would have understood [straight grips 330] are pistol-grip handles, at least to the same extent as PO contends infringes.” Pet., 20.

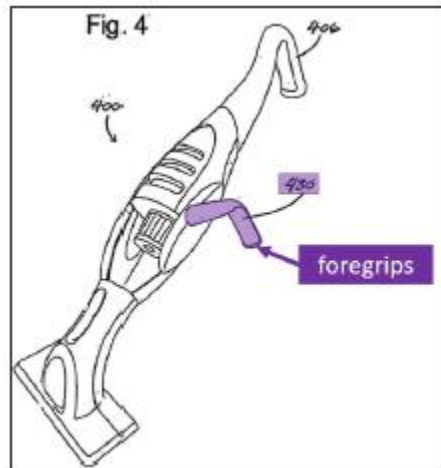


Pet., 20 (citing Ex1005, Ex1021). But Petitioners’ comparison is confused. Ex2001, ¶ 78. As illustrated in above, Petitioners’ accused V15 product clearly includes a pistol grip handle below the suction motor and fan assembly (and Petitioners have not denied as much in the co-pending ITC investigation). Butler’s Figure 3 embodiment, by contrast, discloses horizontally extending straight grips 330. Ex1005, 19:18–22. There is no apparent connection between what Patent Owner accused of infringement in the ITC investigation and the straight grips of Butler’s Figure 3 embodiment. Ex2001, ¶ 78.

Thus, Petitioners have failed to show that the embodiment of Figure 3, or any embodiment of Butler with straight grips, discloses the claimed “pistol grip handle” of claims 1 and 12 of the ’983 Patent.

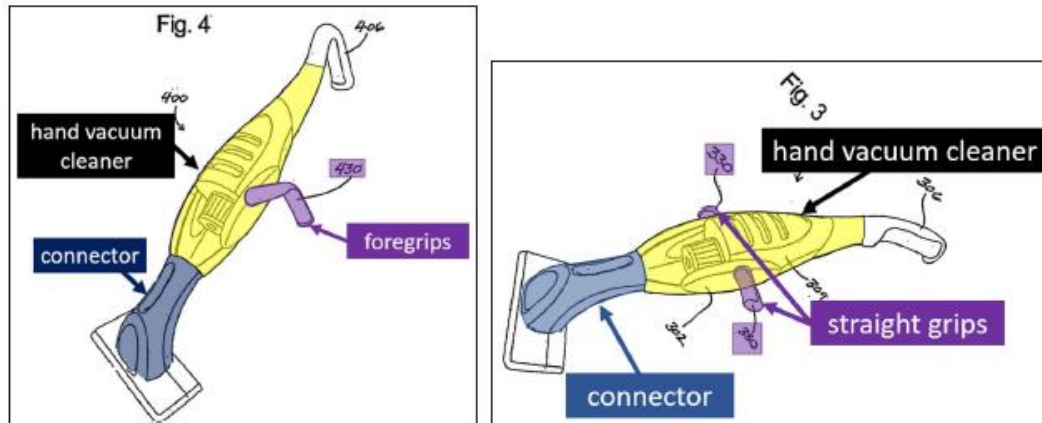
b. Neither Figure 3's foregrips 330 nor Figure 4's foregrips 430 are a "driving handle"

In addition to straight grips 330, Petitioners additionally argue that Butler's "pistol-grip style foregrips 430" (shown below) are the claimed "pistol grip handle" that is a "driving handle." Pet., 19, 24, 35.



Id. For both elements [1c.4] and [12c.1.ii], Petitioners' analysis of the "driving handle" limitation is contained in a single, short paragraph:

When Butler's hand vacuum cleaner is mounted to the downstream end of the rigid air flow conduit, the handle is a driving handle for the surface cleaning apparatus. Ex1002 ¶127. Butler's "pistol-grip style foregrips 430" and "straight grips 330" are used to "ergonomically maneuver the device and rotate it into different positions for cleaning horizontal and inclined surfaces:



Pet., 24, 35 (citing Ex1005, 19:9–12, 19:22–24). As supported by Patent Owner’s expert, Petitioners’ analysis is conclusory and wrong. Neither straight grips 330 or pistol-style grips 430 are a “driving handle” for the surface cleaning apparatus. Ex2001, ¶¶ 80–84.

Petitioners mischaracterize the disclosure of Butler. Butler does not state that straight grips 330 or pistol-style grips 430, alone, are used to “ergonomically maneuver the device.” Instead, the portion of Butler quoted by Petitioners refers to the fact that “the loop-shaped grips may be replaced with any combination of rear grip and foregrip that provide the user with hand positions to ergonomically maneuver the device and rotate it into different positions for cleaning horizontal and inclined surfaces.” Ex1005, 19:6–12 (quoted by Petitioners at Pet., 24, 35). In other words, as explained by Dr. Sorensen, “it is the *combination* of the rear and foregrips in Butler that allow the maneuverability described.” Ex2001, ¶ 82. Butler does not support that any of the foregrips alone (apart from the rear grip) is a “driving handle.”

While other patents in the family of the '983 Patent claim just a “handle,”¹ such as for a hand vacuum cleaner, the independent claims of the '983 Patent require that the “pistol grip handle” is a “*driving* handle” for a surface cleaning apparatus made up of a hand vacuum cleaner, a rigid air flow conduit, and a surface cleaning head. Ex1001, cls. 1, 12. Petitioners effectively ignore this distinction and treat *any* handle as a “driving handle.” This is incorrect. The '983 Patent explains the following with respect to the “drive handle” (*i.e.*, “driving handle”) of the patent:

When mounted to upright section 108, a user may grasp handvac 112 to manipulate upright section 108 ***to steer surface cleaning head 104 across a surface to be cleaned.*** Accordingly, when handvac 112 is mounted to upright section 108, ***handle 484 is the drive handle*** of surface cleaning apparatus 100. Ex1001, 10:22–27 (emphases added). The specification again emphasizes that the “drive handle” is to “steer surface cleaning head 104 across the surface to be cleaned.” *Id.*, 19:26–29. Thus, as explained by Dr. Sorensen, a “*driving* handle” of a surface cleaning apparatus is the handle that is used to drive (or move) the surface cleaning apparatus for its intended purpose, “such as moving it forward and backward across the surface to be cleaned, imparting substantial forces to various

¹ See, *e.g.*, Ex2005 ('661 Patent), cl. 1 (“a vacuum cleaner body comprising . . . a handle”).

horizontal and vertical surfaces, and manipulating the device's position and orientation with a high degree of flexibility and control.” Ex2001, ¶ 83.

But these kinds of activities are not possible with Butler's vacuum using only foregrips 330 or 430 (without a rear grip). Ex2001, ¶ 83. In particular, with the foregrips positioned to the *side* of the center of gravity of Butler's vacuum, it would require too much grip strength for a user to use one of the foregrips to drive the surface cleaning apparatus across the surface to be cleaned, let alone maneuver it with a high degree of flexibility and control. *Id.* Thus, foregrips 330 or 430 are not a “driving handle” in the context of the '983 Patent. Rather, as explained above, in the '983 Patent a “driving handle” would be understood by a POSITA to be a handle intended to be gripped and regularly used to steer and drive a vacuum cleaner across the floor—not simply any structure that may be gripped during use. Ex2001, ¶¶ 82–83; *see also* Ex1001, 10:22–27, 19:26–29.

Tellingly, in challenging Patent Owner's U.S. Patent No. 11,903,546 (which is related to the '983 Patent), Petitioners reasonably identified the *rear* handle of Butler—“pistol-grip style rear grip 406”—as the “driving handle for the surface cleaning apparatus.” IPR2024-01162, Paper 1 at 56–57 (Jul. 11, 2024). A pistol grip handle in such a position *is* used for driving a surface cleaning apparatus across the floor to be cleaned. Here, however, Petitioners do not contend that the rear grip of Butler is the claimed “driving handle” (and they cannot because it is not mounted

forward of a rear end of the suction motor), nor do they contend that the combination of the foregrips and rear grip meets the “driving handle” limitation (again, because at least part of the “driving handle” would be mounted rearward of the suction motor). See Pet., 24, 35. Petitioners do not provide any evidence or explanation as to how a user could maneuver and manipulate the vacuum of Butler using only one of the foregrips.

Thus, Petitioners have failed to show that the embodiments of Figures 3 and 4, or any embodiment with foregrips 330 or 430, disclose that the claimed “pistol grip handle” is a “driving handle” as required by claims 1 and 12 of the '983 Patent.

2. Butler Does Not Render Obvious the Claimed “Pistol Grip Handle” Is a “Driving Handle” ([1c.2], [1c.4], [12c.1.ii], [12c.2])

Petitioners do not argue in the Petition that, to the extent Butler does not disclose the claimed “pistol grip handle” is a “driving handle,” this limitation would have been obvious in view of Butler alone. Pet., 24–25 (no obviousness arguments for element [12c.1.ii]), 35–36 (no obviousness arguments for element [1c.4]). Thus, Petitioners have failed to show that Butler render obvious the claimed requirements of the “pistol grip handle,” including that it is a “driving handle.”

Although Petitioners argue that Butler says that some of its embodiments are “interchangeable,” Pet., 11–12, Petitioners fail to show or describe any embodiments or features that, when combined, meet this claim element. Ex2001, ¶ 86.

Specifically, Petitioners do not identify any component in any embodiment of Butler that is a “pistol grip handle” that “mounted to an outer wall of the hand vacuum cleaner at a location . . . forward of a rear end of the suction motor” and is a “driving handle.” See Pet., 24–25, 35–36. Therefore, no combination of Butler’s embodiments would meet this limitation.

In connection with elements [1c.2] and [12c.2] (which has to do with the location of the pistol grip and not whether it is a “driving handle”), Petitioners argue:

[A] POSA would have found it obvious to improve the maneuverability of Butler’s cleaner by mounting the handle at a location that reduces asymmetrical weight balance caused by heavy components like the motor, thereby increasing ergonomics and reducing strain on the user, which is a stated goal of Butler.

Pet., 33. Petitioners, however, do not provide any specifics about where they propose moving the handle or how the handle would be oriented in the modified configuration, other than saying it would be “at a location rearward of the front end and forward of a rear end of the suction motor.” See *id.*

In any event, even if this modification would satisfy elements [1c.2] and [12c.2], as explained by Dr. Sorensen, a POSITA would not have been motivated to modify *any* embodiment in Butler to meet the “driving handle” limitation. Ex2001, ¶¶ 87–93. For example, Butler distinguishes its “stair cleaning vacuum cleaner” from the surface cleaning apparatus of the ’983 Patent based on, *inter alia*, its dual-

grip configuration, which allows a user to “simultaneously grasp the [foregrips and rear grip] . . . and clean staircases surfaces while remaining substantially upright.” Ex1005, Abstract, 25:9–26:10; Ex2001, ¶ 89. Butler’s stated advantage is being able to use both grips simultaneously to impart forces and torques to a degree not achievable using conventional one-handed hand vacuum cleaners. Ex2001, ¶ 89 (citing Ex1005, 12:17–24, 16:5–7, 19:12–15, 21:9–13). Any proposed configuration of Butler in which a single grip (such as one of the foregrips) is used to drive the vacuum would undermine the fundamental purposes and design of Butler. Ex2001, ¶¶ 89–90. Indeed, Butler disparages certain modifications of its vacuum cleaner (such as placing a single handle below the center of gravity), stating that it “lead[s] to an unstable situation.” Ex1005, 13:13–16; Ex2001, ¶ 93. A POSITA would therefore *not* have modified Butler in any way to create a “driving handle” that is forward of a rear end of the suction motor, as claimed.

Because no embodiment of Butler discloses or renders obvious all claim limitations, Petitioners have failed to demonstrate a reasonable likelihood of success on any claim in Ground 1.

B. Petitioners Failed to Show that Butler in Combination with Jianan Renders Obvious Challenged Claims 3, 10–11, 16, and 21–22 (Ground 2)

Petitioners do not contend that the combination of Butler and Jianan renders obvious independent claims 1 and 12 of the ’983 Patent. *See* Pet., 2. In this Ground,

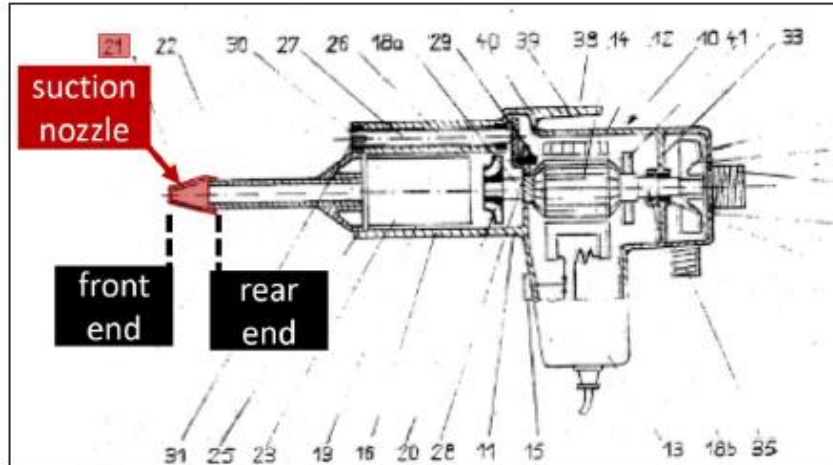
for the requirements of claims 1 and 12, Petitioners rely on their analysis from Ground 1. *See id.*, 67. Because Petitioners failed to show that Butler renders obvious independent claims 1 and 12 (as explained above), Butler in combination with Jianan fails to render obvious dependent claims 3, 10–11, 16, and 21–22. As such, Petitioners fail to demonstrate a reasonable likelihood of success on Ground 2.

C. Petitioners Failed to Show that Rebel in Combination with Martelliere Renders Obvious Challenged Claims 1–2, 4–10, 12–15, and 17–21 (Ground 3)

With respect to Ground 3, Petitioners fail to show that Rebel in combination with Martelliere renders obvious any Challenged Claim for two independent reasons: first, the Rebel and Martelliere combination does not disclose the claimed “surface cleaning head”; and second, Petitioners failed to show that a POSITA would have been motivated to combine Rebel and Martelliere.

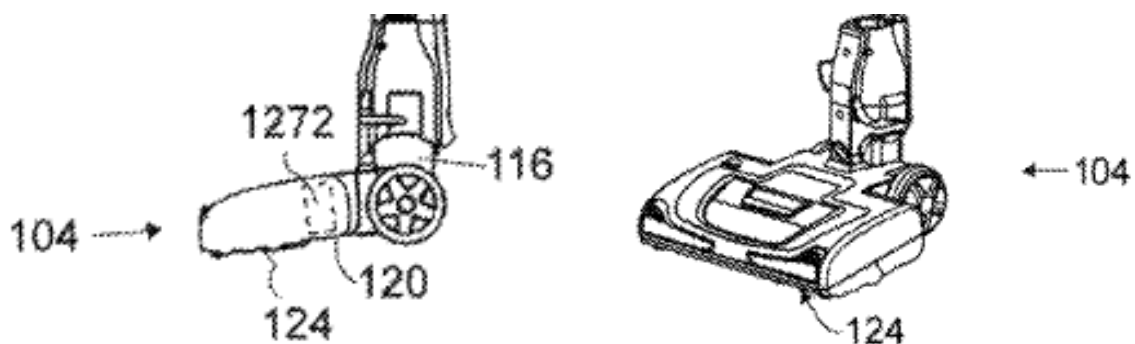
1. Rebel Does Not Disclose the Claimed “Surface Cleaning Head” ([1b], [12b])

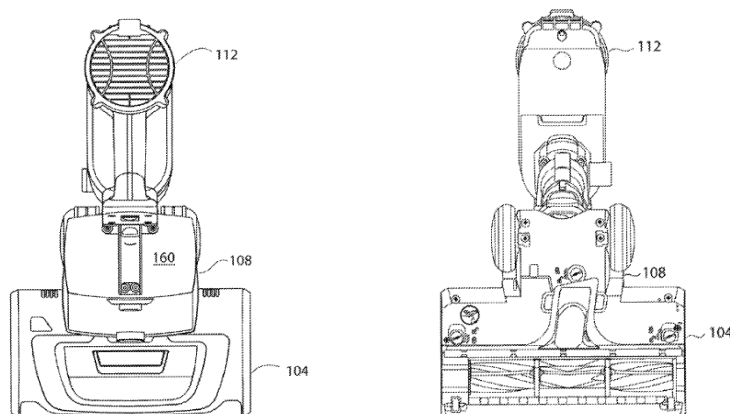
Independent claims 1 and 12 each require “a surface cleaning head having a front end, a rear end, a dirty air inlet and a surface cleaning head air outlet.” On these limitations, Petitioners point to Rebel’s “suction nozzle 21” (shown below), through which the electric motor “sucks in the air and the dust.” Pet., 91–92; Ex1007, 4, Fig. 1.



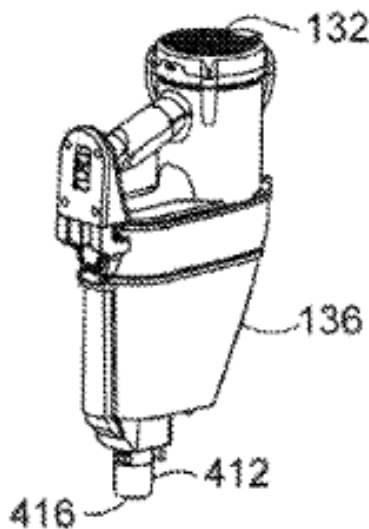
Pet., 92 (Ex1007, Fig. 1 as annotated by Petitioners). But a POSITA would not consider suction nozzle 21 to be a “surface cleaning head” as claimed in the ’983 Patent. Ex2001, ¶¶ 99–106.

In the ’983 Patent, the “surface cleaning head” (item 104 in the figures) is “steer[ed] . . . across the surface to be cleaned,” including with attached wheels. Ex1001, 19:26–28. In one embodiment, “lower end 120 of surface cleaning head 104 includes a dirty air inlet 124,” which is the beginning of an airflow path to the clean air outlet 132 of the hand vacuum cleaner. *Id.*, 10:30–33. Below are several images of the surface cleaning heads in embodiments of the ’983 Patent:





Ex1001, Figs. 3 (excerpted), 12a (excerpted), 18. Importantly, the '983 Patent distinguishes between a “surface cleaning head” (such as those shown above) and a “nozzle” (shown below), which is more of a cylindrical spout to the hand vacuum cleaner. See *id.*, 17:16–24, 21:2–6, 21:60–64.



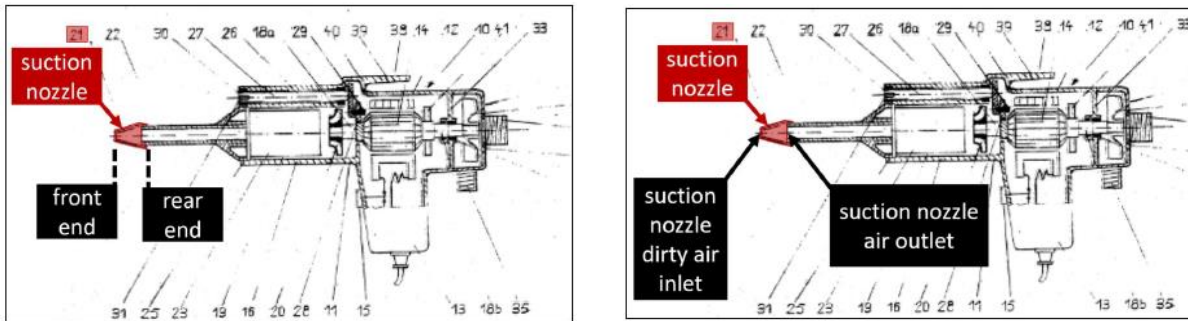
Id., Fig. 12a (excerpted) (“nozzle 412”).

While the claim term “surface cleaning head” is not limited by any specific embodiment, the above examples serve to underscore the fundamental differences between the “surface cleaning head” claimed in the '983 Patent and the suction

nozzle 21 of Rebel. Unlike the “surface cleaning head” of the ’983 Patent, suction nozzle 21 of Rebel is just that—a nozzle. Ex2001, ¶ 103. A POSITA would understand the differences between a “surface cleaning head” and a nozzle such as suction nozzle 21, including with respect to size and shape. *Id.* For example, a “surface cleaning head” is of sufficient size so that the “front end” and “rear end” engage with the surface to be cleaned. *Id.* (citing Ex1001, 9:66–10:53, Figs. 1–21).

Petitioners argue that suction nozzle 21 “is a surface cleaning head that has a front end and a rear end as shown because it is a three-dimensional nozzle designed to interact with the surface to be cleaned.” Pet., 91. A POSITA would understand that this criteria of a “surface cleaning head” is too broad. Ex2001, ¶¶ 100–02. For example, under this definition, any nozzle (which are three-dimensional by nature) would be a “surface cleaning head.” *Id.* But, as noted above, the ’983 Patent distinguishes between a “nozzle” and the claimed “surface cleaning head.” Petitioners’ interpretation of “surface cleaning head” is thus too broad.

Further undercutting Petitioners’ argument is the fact that, as shown below, Petitioners point to the same part of suction nozzle 21 as both the claimed “rear end” and the “surface cleaning head air outlet”:



Pet., 92. There is no support in the '983 Patent for defining the “rear end” of the surface cleaning head to also be its “air outlet.” See *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) (“Where a claim lists elements separately, the clear implication of the claim language is that those elements are distinct components of the patented invention.”) (internal quotation marks omitted)); *Engel Indus., Inc. v. Lockformer Co.*, 96 F.3d 1398, 1404–05 (Fed. Cir. 1996) (concluding that where a claim provides for two separate elements, a “second portion” and a “return portion,” these two elements “logically cannot be one and the same”). Petitioners allegations therefore confirm that suction nozzle 21 cannot be the claimed “surface cleaning head.”

Although Petitioners do not rely on Martelliere for this limitation, Patent Owner notes that Martelliere too fails to disclose the claimed “surface cleaning head.” The nozzle on the front end of Martelliere’s hand vacuum cleaner is a standard nozzle—not a “surface cleaning head” with a “front end” and a “rear end.” Ex2001, ¶ 106. Petitioners therefore cannot rely on Martelliere for this limitation.

Thus, Petitioners have failed to show that the combination of Rebel and Martelliere discloses the claimed “surface cleaning head” as required by claims 1 and 12 of the '983 Patent.

2. A POSITA Would Not Have Been Motivated to Combine Rebel and Martelliere

Even if it were determined that the Rebel and Martelliere combination discloses a “surface cleaning head,” Petitioners failed to show that a POSITA would have been motivated to combine Rebel and Martelliere. Ex2001, ¶¶ 107–28.

Petitioners concede that Rebel does not disclose “a cyclone unit comprising a cyclone chamber having a cyclone axis of rotation” because it uses dust bag separation. Pet., 77–78. Petitioners thus propose replacing Rebel’s dust bag separation with Martelliere’s cyclonic filtration. *Id.* But, as Dr. Sorensen testifies, a POSITA would not have been motivated to modify Rebel to use cyclonic separation because Rebel discloses a fully formed, working design for a multipurpose device (*i.e.*, a combined vacuum cleaner, polisher, and water sprayer), which would not benefit from Martelliere’s cyclonic separation. Ex2001, ¶ 107.

As explained above, Rebel describes a “[m]ultipurpose device” for “handheld vehicle care,” which includes “a motor-driven vacuum cleaner,” “a tool drive, for example for a polishing brush,” and “a water pump connected or connectable to the drive of the vacuum cleaner.” Ex1007, 1; Ex2001, ¶ 108. The objective of Rebel is to provide all of these features so a vehicle owner “can carry out the various care

tasks quickly and without effort and which does not require a great deal of storage space.” *Id.* By contrast, Martelliere relates to a cyclonic separation apparatus for a “broom type vacuum cleaner model,” which a POSITA would have understood is much larger in size than Butler. Ex1019, 1; Ex2001, ¶ 108. Indeed, a hand vacuum the size of Martelliere would not be effective for cleaning vehicles, such as getting between and under seats. *See id.* Given these and the other differences between these references, a POSITA would not have been motivated to combine Rebel and Martelliere.

Rebel describes a fully functional vacuum cleaner with filter-bag-based dust separation technology. Ex1007, 1, Fig. 1. Even though prior to the '983 Patent alternate dust separation techniques existed, Rebel does not suggest replacing its effective filtering with a different technology, such as cyclonic separation. To the contrary, a POSITA at the time of the '983 Patent reading Rebel would have understood that Rebel's dust-bag separation system was already highly effective compared with alternate separation methods, including cyclones. Ex2001, ¶ 110; Ex2002, 575, 578, 579, 583 (“In vacuum technology testing, filter-based separators performed more favorably than cyclonic separators in the areas of pressure drop, efficiency, and particle reentrainment.”). Thus, a POSITA would not have been looking in the first place to change Rebel's separation technology.

Even if looking to change Rebel's separation technology, a POSITA would not have looked to the cyclonic separation of Martelliere. Although patent figures are not necessarily to size, given their applications, a POSITA would understand the vacuum cleaner of Rebel to be relatively small compared to that of Martelliere. Ex2001, ¶ 111. For example, Dr. Sorensen estimates that, as a device for cleaning interiors of vehicles, the front part of Rebel (the separation system) would have a diameter of no more than two or three inches. *Id.* Martelliere, by contrast, as a "broom type vacuum" would have a cyclonic separation system of much larger diameter. *Id.* Given these disparities in sizes, a POSITA would have understood that Rebel's small dust separation system could not be modified to include Martelliere's large cyclonic separation without increasing the size of Rebel's device, which is directly contrary to Rebel's teachings to have a small device for vehicle cleaning applications. Ex2001, ¶ 112.

Nor would a POSITA be motivated to "shrink" Martelliere's cyclonic separation system to fit within the existing housing of Rebel. Ex2001, ¶ 113. Indeed, it was known to a POSITA at the time of the '983 Patent that reducing the outside diameter of a cyclone diminishes its overall effectiveness. *Id.*; Ex2003, 234–35 ("Enlarging the cyclone diameter D also increases the efficiency"); Ex2004, 1007–08 ("[T]he particle collection efficiency for a cyclone having a larger body diameter is higher than that for a smaller cyclone."). In view of this, and because a

POSITA would not expect a cyclonic separation system to improve the effectiveness of Rebel's dust bag filtration, a POSITA would not have been motivated to miniaturize Martelliere's cyclonic separation (thus reducing its effectiveness) to fit in Rebel. Ex2001, ¶ 113.

Petitioners argue that a POSITA would have been motivated to use Martelliere's cyclonic filtration "for its many known benefits," such as preventing clogging, creating stable suction, and by using a transparent cyclonic chamber to "better judge when it must be emptied." Pet., 79. But, as explained by Dr. Sorensen, these are not "benefits" that Martelliere's cyclonic filtration is indispensable for achieving. It was understood by a POSITA at the time of the '983 Patent that it was not universally true that cyclonic separation achieved stable suction and prevented clogging, especially for devices the size of that in Rebel. Ex2001, ¶ 117. In fact, a POSITA would have been aware that in some vacuums, greater suction loss occurs in cyclonic separators than bag filters. Ex2002, 575, 578, 579, 583. For example, a POSITA would have understood that there could be substantial back pressure (leading to suction loss) across a single small cyclone. Ex2001, ¶ 117.

Similarly, the benefit of a transparent chamber was not unique to cyclonic separation systems. *Id.*, ¶ 118. For example, Butler (discussed in connection with Ground 1) discloses non-cyclonic embodiments with a clear housing to give a visual indication of how full the container is. Ex1005, 15:18–18:2, Figs. 2A–2C. Thus, a

POSITA need not use Martelliere's cyclonic separation to have the benefit of a clear housing in Rebel.

Petitioners argue that this is a "simple substitution" because Rebel and Martelliere "hav[e] a similar form factor and orientation." Pet., 79. As explained above, however, either Martelliere's cyclonic separation system would have to be reduced in size to work in Rebel (thus minimizing its effectiveness) or Rebel would have to be grown in size to accommodate Martelliere's cyclonic separation system (thus eliminating one of the advantages of Rebel). See Ex2001, ¶¶ 110–13.

Finally, Petitioners argue that "during prosecution of the '983 Patent, the Examiner found—and the Applicant did not dispute—it would have been obvious to substitute cyclonic-separation units for non-cyclonic separation units." Pet., 81. Petitioners misread the prosecution history. During prosecution of the '983 Patent, the Examiner issued a rejection that

it would have been obvious to one skilled in the art at the time of the invention to substitute the cyclone unit in Conrad for the separation assembly in the hand vacuum cleaner in Mori et al. since the cyclone unit in Conrad is used for the same purpose of separating dust particles from air as the separation assembly in Mori et al.

Ex1004, 260–61. In response to the rejection, the applicant amended the claims and, contrary to Petitioners arguments, did not concede to the Examiner's position. To

the contrary, the applicant included the following disclaimer to make it clear that it did not agree with the statements made by the examiner:

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. . . . Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

Id., 280. Petitioners simply ignore the applicant's response to the Examiner.

At bottom, Petitioners failed to show that a POSITA would have been motivated to modify Rebel to use cyclonic separation, such as in Martelliere. Even if there were a finite number of dust-separation solutions were known, that does not mean that a POSITA would have been motivated to try them all in Rebel. Ex2001, ¶¶ 119–20. As explained by Dr. Sorensen, because Rebel's filtration system was already effective for the stated purposes of Rebel, a POSITA would not have been looking to change Rebel's filtration system, let alone replace it with Martelliere's cyclonic filtration. *Id.*

Because Rebel does not disclose the claimed "surface cleaning head," and because a POSITA would not have been motivated to combine Rebel and

Martelliere, Petitioners have failed to demonstrate a reasonable likelihood of success on any claim in Ground 3.

D. Petitioners Failed to Show that Rebel in Combination with Martelliere and Jianan Renders Obvious Challenged Claims 3, 10–11, 16, and 21–22 (Ground 4)

Petitioners do not contend that the combination of Rebel, Martelliere, and Jianan renders obvious independent claims 1 and 12 of the '983 Patent. *See* Pet., 2. In this Ground, for the requirements of claims 1 and 12, Petitioners rely on their analysis from Ground 1. *See id.*, 125. Because Petitioners failed to show that Rebel in combination with Martelliere renders obvious independent claims 1 and 12 (as explained above), Rebel in combination with Martelliere and Jianan fails to render obvious dependent claims 3, 10–11, 16, and 21–22. As such, Petitioners fail to demonstrate a reasonable likelihood of success on Ground 4.

VI. CONCLUSION

For the foregoing reasons, Petitioners have not met their burden of showing a reasonable likelihood that at least one of the Challenged Claims is unpatentable, and institution of *inter partes* review should be denied.

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Respectfully Submitted,

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CERTIFICATION UNDER 37 C.F.R. § 42.24(d)

Under the provisions of 37 C.F.R. § 42.24(d), the undersigned attorney hereby certifies that this document complies with the type-volume limitations of 37 C.F.R. § 42.24(b). The word count of the foregoing Patent Owner's Preliminary Response is 5,865, according to the word count tool in Microsoft Word.

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CERTIFICATE OF SERVICE

The undersigned certifies service pursuant to 37 C.F.R. § 42.120 of a copy of this Patent Owner's Preliminary Response and supporting materials upon Petitioners by email on December 12, 2024, to the following email addresses of record:

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