

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SHARKNINJA, INC.,
SHARKNINJA OPERATING LLC,
SHARKNINJA MANAGEMENT LLC, AND
SHARKNINJA SALES COMPANY
Petitioners,

v.

DYSON TECHNOLOGY LIMITED,
Patent Owner.

Case No. IPR2023-01322
U.S. Patent No. 10,433,687

REPLY TO PATENT OWNER'S RESPONSE

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PETITIONER'S EXHIBIT LIST

Exhibit	Description
1001	U.S. Patent No. 10,433,687
1002	File History for U.S. Patent No. 10,433,687 (Appl. No. 15/269,430)
1003	Declaration of Joseph Fester
1004	U.S. Patent Publication No. 2011/0314630 ("Conrad'630")
1005	EP Publication No. 1,199,023 ("Matsumoto")
1006	U.S. Patent Publication No. 2016/0174787 ("Conrad'787")
1007	Int'l Publication No. WO 2008/009888 ("Dyson")
1008	U.S. Patent No. 9,301,663 ("Conrad'663")
1009	Declaration of Brian A. Rosenthal in Support of Petitioners' Motion for Pro Hac Vice Admission
1010	Declaration of Ahmed ElDessouki in Support of Petitioners' Motion for Pro Hac Vice Admission
1011	Transcript of Deposition of Mr. Davidshofer
1012	Exhibit 2 to the Deposition of Mr. Davidshofer
1013	Exhibit 8 to the Deposition of Mr. Davidshofer
1014	Exhibit 9 to the Deposition of Mr. Davidshofer

TABLE OF ABBREVIATIONS

Abbreviation	Term
'687 patent	U.S. Patent No. 10,433,687 (Ex-1001)
AIA	America Invents Act
Board	Patent Trial and Appeal Board
Challenged Claims	Claims 1–4, 8 and 10 of U.S. Patent No. 10,433,687
Conrad'630	U.S. Patent Publication No. 2011/0314630 (Ex-1004)
Conrad'663	U.S. Patent No. 9,301,663 (Ex-1008)
Conrad'787	U.S. Patent Publication No. 2016/0174787 (Ex-1006)
Davidshofer Declaration	Declaration of Donald Davidshofer (Ex-2017)
Dyson	Int'l Publication No. WO 2008/009888 (Ex-1007)
Ex.	Exhibit
Fester Declaration	Declaration of Joseph Fester (Ex-1003)
Fig.	Figure
IPR	<i>inter partes</i> review
Matsumoto	EP Publication No. 1,199,023 (Ex-1005)
Patent Office	United States Patent and Trademark Office
Petitioners	SharkNinja Operating LLC, SharkNinja Management LLC, and SharkNinja Sales Company
PO	Patent Owner Dyson Technology Limited
POR	Patent Owner Response
POSITA	person of ordinary skill in the art

I. INTRODUCTION

The Challenged Claims—directed to a handheld vacuum having a specific dustbin and handle configuration—present an obvious combination based on Grounds 1-4 in the Petition. The dustbin and handle configurations were both known, and Petitioners explained that it would have been obvious to combine those two features to form a device that meets all of the claims in four separate obviousness grounds. PO's Response fails to rebut the Petition.

As to Grounds 1 and 2 (Conrad'630 in view of Conrad'787 or Dyson), PO created its own flawed combination that PO then critiqued in support of its flawed argument that there would have been no motivation combine Conrad'630 with Conrad'787 or Dyson. PO, however, failed to consider explicit teachings in the prior art and the combination proposed by Petitioners.

As to Grounds 3 and 4 (Matsumoto in view of Conrad'787 or Dyson), PO's argument that the Challenged Claims are satisfied only by a "handheld vacuum" are contradicted by PO's expert, Mr. Davidshofer. In any event, a POSITA would have understood that Matsumoto discloses a vacuum that could have been used as either a stick vacuum or a handheld vacuum. PO's argument that the proposed combination would not work is also incorrect—its expert admitted that he failed to consider key parameters in reaching his conclusions. Mr. Davidshofer's failures are not surprising, given that he testified that he spent only "10 or 12 hours" preparing his

85-page declaration, which is largely a word-for-word replica of the Patent Owner's Response. Ex-1011 at 115:9-12. Mr. Davidshofer's conclusory opinions, much like Petitioners' arguments based thereon, should be rejected in their entirety.

II. GROUNDS OF UNPATENTABILITY

A. GROUND 1: Conrad'630 in View of Conrad'787 Render the Challenged Claims Obvious

Petitioners and their expert, Mr. Fester, proposed a specific way a POSITA would have modified Conrad'630 to incorporate the teachings of Conrad'787, and provided mock-ups illustrating the combination. However, PO and its expert, Mr. Davidshofer essentially ignore the proposed combination. Instead of addressing the combination proposed by Petitioners, PO created new modified versions of Conrad'630 and then went on to explain why PO's strawman combinations would not work. Importantly, Mr. Davidshofer conceded that a POSITA would not have modified Conrad'630 in the way that he had proposed. As such, PO's arguments concerning its proposed strawman version of Conrad'630 should be disregarded. In any event, PO's arguments against its strawman version of Conrad'630 fail.

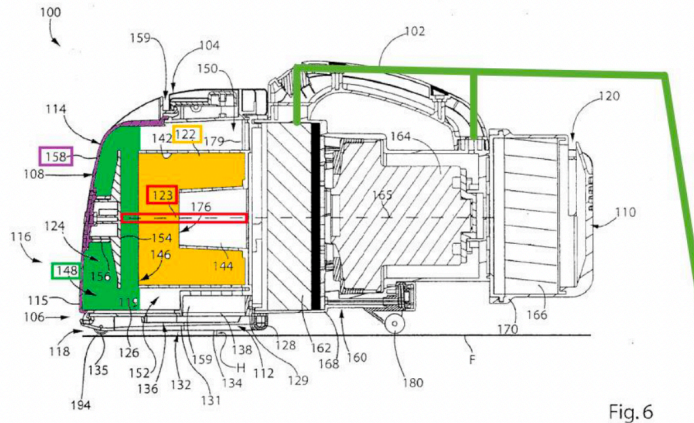
1. PO Fails to Address Petitioners' Proposed Combination of Conrad'630 and Conrad'787

Conrad'630 discloses a handheld vacuum cleaner that satisfies the limitations of the Challenged Claims other than for the final limitation of claim 1 relating to the handle configuration. *See generally* Pet., 28-51. Conrad'630's vacuum was shown

having a handle 102 on the top of the vacuum, but Conrad'630 made clear that the “handle 102 *may be provided elsewhere* on the vacuum cleaner 100, for example *at the rear 110* and may be of any design.” Ex-1004, ¶52 (emphases added); Pet., 23 (annotating Ex-1004, Fig. 6).

In view of Conrad'630's explicit teaching that the handle may be placed “at the rear” of the vacuum, Petitioners argued that the Challenged Claims are obvious over Conrad'630 in combination with Conrad'787, which has a handle at the rear and which discloses the claimed configuration of the handle. The Petition explained that “a POSITA could have designed a handle that attaches to the vacuum cleaner of Conrad'630 *at the same location that the current handle attaches*, and which extends to the rear of the vacuum cleaner and then forms a pistol shaped handle, which is sloped relative to the longitudinal axis 123 (red) at an angle *consistent with the disclosure of Conrad'787* (which is within the range claimed by claims 1 and 2 of the '687 patent).” Pet., 28 (emphases added). Mr. Fester also provided several sketches showing alternative designs for the handle of Conrad'630, *which “incorporate the teachings of Conrad'787.”* Ex-1003, ¶76.¹ One sketch is reproduced below:

¹ Bolded text is added emphasis.



Mockup of Figure 6 of Conrad '630 to show an alternative design of the handle consistent with the teachings of Conrad '630 and Conrad '787.

Ex-1003, 35.

Notably, the modified Conrad'630 vacuum above is shown as having a handle with two portions. The first is synonymous with Conrad'630's handle 102; located at the top of the vacuum and attaches at the same location as the existing handle 102. The second extends from handle 102 to the rear of the vacuum in a way that *incorporates the teachings of Conrad'787*. Pet., 28; Ex-1003, 35-37. The Petition explained that this modified handle would provide “*more flexibility* in using the *handheld vacuum*,” which is especially important when the handheld vacuum is used with attachments. Pet., 27 (emphases added); Ex-1003, ¶72.

At his deposition, Mr. Fester explained that there is a motivation to add “more flexibility in using the handheld vacuum with an attachment for different types of cleaning,” which would require “retaining essentially handle 102 of the existing [Conrad'630] and then adding handle 484 of [Conrad'787] to the rear.” Ex-2018,

135:16-136:2. He also explained that doing so would provide “optionality,” that “would allow the user to hold the vacuum at a somewhat horizontal angle for cleaning horizontal surfaces and then use the pistol grip of [Conrad’787] at the rear for vertical surfaces.” *Id.* at 91:14-22. Mr. Davidshofer, PO’s expert, similarly agreed that for handheld vacuum cleaners—like Conrad’630—the user would “orient it while[] using it,” meaning that “depending on the substrate you’re cleaning, it could be a curtain. It could be a couch. It could be a floor. It could be something on your kitchen counter, just wherever the dust or dirt is that you want to pick up or contain, ***the orientation is conducive to the matter that you’re picking up and where it is.***” Ex-1011, 23:18-24:10. Mr. Davidshofer also conceded that it would be possible to keep the original handle and add a modified handle, to “maintain the advantages of the original handle.” *Id.* at 64:3-25.

PO’s Response, however, failed to address the Petitioners’ arguments on how a POSITA would have modified the handle of Conrad’630 based on the teachings of Conrad’787. Instead of addressing the modified vacuum as it was proposed by Petitioners, PO proposed its own modified versions that deleted the original handle of Conrad’630 and added a smaller handle to the rear of Conrad’630. POR, 18 (illustrating vacuums AA-DD). Notably, when asked about these diagrams, Mr. Davidshofer conceded that a POSITA “would not actually design something similar to this.” Ex-1011, 59:7-13, 59:13-63:18.



POR, 18.

Because PO's arguments against Ground 1 address its own modified versions of Conrad'630—and not the combination shown by Petitioners—they fail from the start. Instead, a POSITA would have been motivated to modify the vacuum of Conrad'630 to incorporate the teachings of Conrad'787 concerning its handle—a combination that indisputably meets all limitations of the Challenged Claims.

2. Both Conrad'630 and Conrad'787 Would Have Motivated a POSITA to Combine

a) Conrad'630's Disclosures Motivate the Combination

Conrad'630's own disclosures would have motivated a POSITA to incorporate the teachings of Conrad'787 regarding its handle, including to improve the operability of the vacuum of Conrad'630 with attachments.

Conrad'630 made clear that the “handle 102 may be provided elsewhere on the vacuum cleaner 100, for example *at the rear 110* and may be of any design.” Ex-1004, ¶52; Pet., 23 (annotating Ex-1004, Fig. 6). PO argues that this explicit disclosure in Conrad'630 is nothing but a “single throw away sentence,” because the

reference does not provide “further guidance as to the alternative handle design.”² POR, 17. Not so. Conrad’630 provides its own specific and explicit disclosure that the handle may be at the rear, which cannot be disregarded with a single throwaway sentence from PO. Such a disclosure is sufficient to motivate a POSITA to explore alternative handles, especially because a POSITA would have known that other handle configurations became popular after the filing of Conrad’630 and further because Conrad’630 was designed to be used with attachments which were “very common at the time.” Ex-1003, ¶¶65, 69. PO’s argument in response does not address that proposed handle arrangement, but instead are premised on PO’s own admittedly flawed modified device. POR, 17-19; Ex-2017, ¶¶56-59; Ex-1011, 59:7-13, 59:13-63:18.

PO and its expert also fail to comprehend that a POSITA would have understood that the vacuum of Conrad’630 can be used with attachments other than hoses, including ones that *may be directly connected to nozzle 412*, such as wands,

² PO’s argument is contradicted by its submissions in IPR2024-01151 (Paper No. 1) at 102 (arguing that a “POSA would have understood the simple substitution of [] handles . . . would achieve the predictable results of increased maneuverability and ergonomics,” and that it would have been obvious to try “positioning the handle above and rearward of the suction motor . . . and positioning the handle below the suction motor.”).

brushes and crevasse tools³—despite that being a key motivation for the combination. Pet., 24-27; Ex-1003, ¶¶69-72 (explaining that a “POSITA would have recognized additional advantages associated with providing the handle at the rear . . . which would allow *more flexibility in using the handheld vacuum with an attachment for different types of cleaning.*”). PO’s argument that the Conrad’630 vacuum can only be used with “hose attachments with a connector” is demonstratively false, as Mr. Davidshofer conceded:

Q. Does Conrad’663 disclose using attachments that are directly attached to the nozzle of the vacuum.

A. Yes.

Q. Does Conrad’663 disclose using wands, brushes, crevice tools, and other hoses with the vacuum?

A. It does.

Q. And do you agree that that nozzle 412 may be directly connected to any of these attachments?

A. That’s what it is suggesting, yes.

Ex-1011, 80:1-81:1; POR, 28; Ex-2017, ¶76.

Thus, as Mr. Fester showed without rebuttal from PO, the Conrad’630 vacuum—as modified to incorporate the teachings of Conrad’787—would be vastly

³ Mr. Davidshofer conceded that the vacuum disclosed in Conrad’663 is the same as the vacuum disclosed in Conrad’630. Ex-1011, 77:10-22; Pet. 24-25. Conrad’663 discloses that using that vacuum with attachments that are connected directly to the nozzle of the vacuum. Pet., 24-25. A POSITA would have understood that, at a minimum, it would have been obvious to use attachments connected directly to the nozzle of Conrad’630’s vacuum.

superior for use with attachments because it would offer more flexibility and optionality. Pet., 27; Ex-1003, ¶72; Ex-2018, 135:16-136:2, 91:14-22.

b) Conrad'787's Disclosures Motivate the Combination

Conrad'787's disclosures regarding comfort would have also motivated a POSITA to incorporate the teachings of Conrad'787 regarding its handle, also to improve the operability of the vacuum of Conrad'630 with attachments.

Conrad'787 discloses that its handvac “is most comfortably operated in an orientation that does not require an application of torque by the user's hands when the handvac 112 is held by handle 484,” which occurs when “the center of gravity 524 of the handvac 112 is aligned vertically below the user's hand.” Ex-1003, ¶30 (citing Ex-1006, ¶314); Pet., 24. As Mr. Davidshofer explained, with handheld vacuum cleaners, like Conrad'630, the user would “orient it while[] using it,” meaning that “[d]epending on the substrate you're cleaning, it could be a curtain. It could be a couch. It could be a floor. It could be something on your kitchen counter, just wherever the dust or dirt is that you want to pick up or contain, *the orientation is conducive to the matter that you're picking up and where it is.*” Ex-1011, 23:18-24:10. Thus, consistent with Mr. Fester's opinions, a POSITA would have been motivated to apply the teachings of Conrad'787 to extend the handle of Conrad'630 rearwardly, which would offer more flexibility and optionality in holding the vacuum. Pet., 27; Ex-1003, ¶72. For example, the modified handle would allow the

user to hold the vacuum at a position that allows for the center of gravity to be aligned vertically below the user's hand to increase comfort, whether the vacuum itself is being held horizontally or vertically (depending on use case). Pet., 27; Ex-1003, ¶72; Ex-2018, 135:16-136:2, 91:14-22.

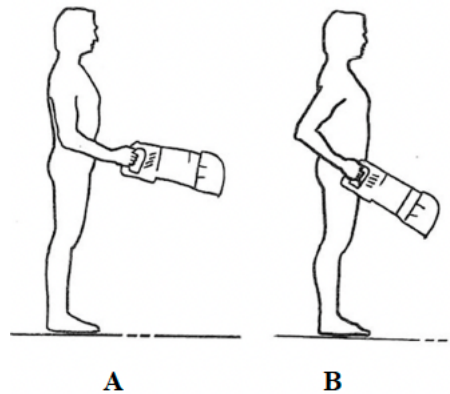
Finally, PO argues, based on the way Conrad'787 defined the angle of its handle relative to the nozzle axis, that "if the teachings of Conrad'787 are applied to Conrad'630, then the handle axis would be at an angle related to the nozzle axis in Conrad'630, not the longitudinal axis of the cyclonic separating unit." POR, 33-35. This argument fails. First, as PO's Response itself shows, a POSITA would not have applied the teachings of Conrad'787 to Conrad'630 in the way that PO proposes (*id.* 35), because it would result in a non-sensical device. Second, the "nozzle axis" in Conrad'787 is parallel to the "longitudinal axis of the cyclone," as recited in claim 1 of the '687 patent. Ex-1006, ¶330 ("the nozzle axis 884, cyclone axis 248, and motor axis 252 are parallel."). If the handle axis is at a specific angle to the nozzle axis, it must be at the exact same angle to a cyclone axis parallel to the nozzle axis.

Thus, Petitioner's application of the teachings of Conrad'787 is entirely consistent with the disclosure of Conrad'787. That is, the proposed modified handle of Conrad'630 would be measured relative to the longitudinal axis of the cyclone, as Mr. Fester did. Pet., 27-28, 37-41; Ex-1003, ¶¶90-100, 75-76.

c) PO's Arguments That the Proposed Combination Is Inferior Fail

Petitioner's proposed combination improves the Conrad'630 vacuum by providing additional flexibility in how the handheld vacuum could be used, and in particular when used with attachments. *See, supra* §II.A.2(a). However, PO argues that "Petitioners' proposed combination results in a vacuum with inferior weight balance that increases wrist elbow, and arm strain during typical use situations." Not so. As shown above (*see, supra* §II.A.1), PO and Mr. Davidshofer only identified deficiencies with their own proposed combination and failed to identify any reason why the combination proposed by Petitioners and Mr. Fester would not work. As such, PO's arguments regarding alleged deficiencies associated with the modified Conrad '630 vacuum should be given no weight. Moreover, as discussed below, PO's arguments are also misleading because they fail to consider operational conditions in the various use cases the PO discusses.

First, PO argues that as "illustrated in A and B below, if a user operates Conrad'630's vacuum ***using Conrad'787's handle located on the rear*** as Petitioners propose, additional strain of the user's hands/wrist would be caused during fore/aft action commonly used during cleaning." POR, 21-22.

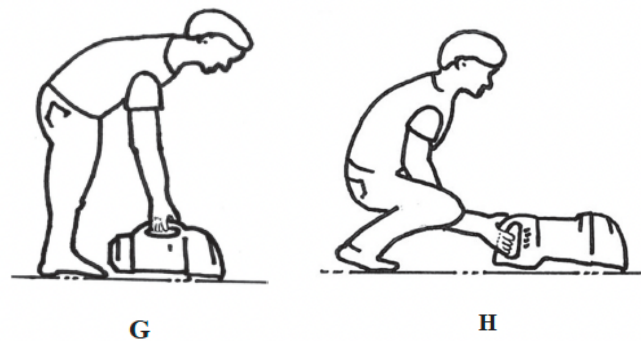


POR, 22.

However, the modified vacuum proposed by Petitioners would allow the user to hold the vacuum cleaner either from the top or the rear, depending on the use case. PO's Figures A and B are misleading because they do not show the Conrad'630 vacuum as it was modified by Petitioners (Ex-1011, 68:2-20), which would offer the user the option of holding the vacuum from the top if the use case so demanded. Thus, PO's argument fails. The diagrams are also misleading as they fail to show the surface to be cleaned, which would support the weight of the vacuum and reduce the stress on the user. In fact, Mr. Davidshofer failed to consider the location of the surface to be cleaned and had no opinion on the location of the surface being cleaned at his deposition, *id.* at 68:25-69:8, and eventually conceded that the vacuum would rest on the surface to be cleaned and that the surface would support the weight of vacuum, thereby reducing the stress on the user's wrist. *Id.* at 69:9-22.

Second, PO argues that picking up the modified Conrad'630 vacuum from the floor would be less comfortable compared with picking up the original Conrad'630

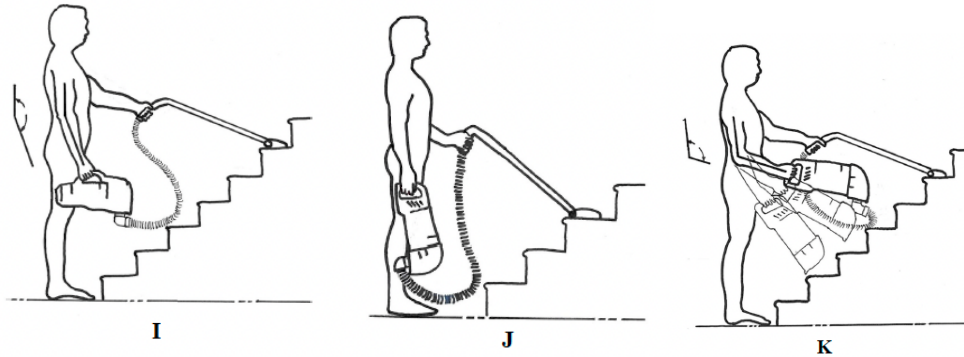
vacuum. POR, 26-27 (comparing Mr. Davidshofer's sketches G, showing the unmodified vacuum, and H, showing the modified vacuum). Not so. Again, Figure H again shows PO's version of the modified Conrad'630 and ignores Petitioners'. Ex-1011, 73:12-15. Mr. Davidshofer conceded that Mr. Fester's proposed combination can be picked up in the same way as the original Conrad'630 vacuum. *Id.* at 73:21-74:2.



POR, 26-27.

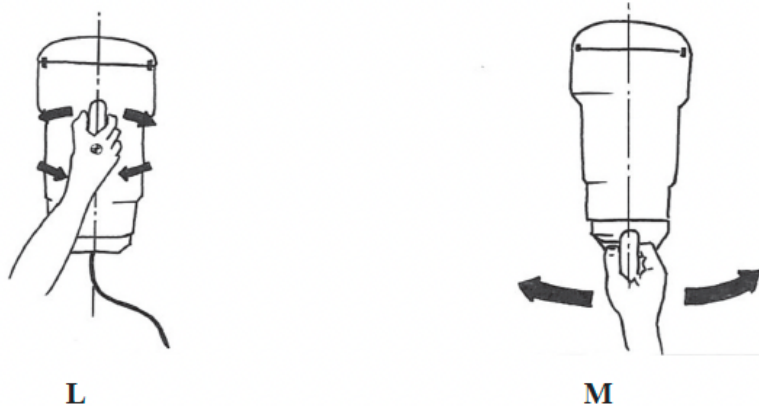
Third, PO argues that operating Conrad'630 with a hose attachment using a handle at the rear would cause the vacuum cleaner to “‘hang’ vertically . . . from the user's hand,” which would “increase user arm/hand stress.” POR, 28-30 (comparing Mr. Davidshofer's sketches I, showing the unmodified vacuum, with J and K, showing the modified vacuum). Again, PO shows its own version of the modified Conrad'630 and ignores Petitioners' proposal. Furthermore, PO's argument is nonsensical. The vacuum weighs the same whether oriented horizontally or

vertically. PO fails to explain how a vacuum (weighing the exact same) would cause additional “arm/hand stress” if hanging vertically.



POR, 28-30.

Fourth, PO argues that operating Conrad'630 using a “handle on the rear” would reduce control of the nozzle on the cleaning surface.” POR, 42 (comparing Mr. Davidshofer's sketches L, showing the unmodified vacuum, with M, showing the modified vacuum). Again, PO shows its own version of the modified Conrad'630 and ignores Petitioners', which would support both use cases. Ex-1011, 74:4-75:7.



POR, 32.

Furthermore, PO is incorrect that a handle at the back would “reduce control” of the nozzle. A POSITA would have known that handheld vacuums very often had handles at the rear, and users have little difficulty “control[ling] the nozzle on the cleaning surface.” Ex-1003, ¶¶14-15, 69. In Petitioners’ proposed modified vacuum, a user would have multiple options for holding and maneuvering the vacuum, depending on surface and preference.

Finally, PO argues that the modified Conrad’630 vacuum would have “reduced efficiency and poorer cleaning performance.” POR, 36-40. However, Mr. Davidshofer conceded that his opinions concerning efficiency and performance do not apply when the modified Conrad’630 vacuum is held using the top portion of Mr. Fester’s modified handle. Ex-1011, 92:22-94:4. Moreover, Mr. Davidshofer conceded that he did not consider the performance of the modified vacuum if it had a crevice tool attached directly to the nozzle of the vacuum cleaner. *Id.* Importantly, PO completely ignored and does not address that the modified handle would provide “*more flexibility* in using the *handheld vacuum with an attachment for different types of cleaning*,” which is especially important when the handheld vacuum is used with attachments. Pet., 27 (emphases added); Ex-1003, ¶72.

Thus, the alleged disadvantages associated with the modified vacuum cleaner are only relevant to PO’s own admittedly unworkable modification to Conrad’630. PO failed to show any deficiency with the modification to Conrad’630 that was

actually proposed by Petitioners. Moreover, PO fails to take into consideration the different use cases for the vacuum cleaner and the benefits of the flexibility offered by the modified Conrad'630 proposed by Mr. Fester.

B. GROUND 2: Conrad'630 in View of Dyson Render the Challenged Claims Obvious

1. PO Fails to Address Petitioners' Proposed Combination of Conrad'630 and Dyson

As discussed above in Section II.A.1, Petitioners and Mr. Fester, proposed a specific manner in which a POSITA would have modified Conrad'630 to incorporate the teachings of Dyson, and provided mock-ups illustrating the combination. Again, PO and its expert, Mr. Davidshofer, completely ignored Petitioners' proposed combination, and then went on to explain why PO's own proposed combinations would not work. Importantly, Mr. Davidshofer conceded that a POSITA would not have modified Conrad'630 in the way that he had proposed. As such, PO's arguments concerning the modified version of Conrad'630 should be disregarded for the reasons explained in Section II.A.1.

2. Petitioners Showed That the Combination Discloses Limitation 1d and Claim 2

PO argues that Petitioners have not shown that the *combination* of Conrad'630 and Dyson discloses the limitation 1d and claim 2, because “**Dyson** does not disclose that ‘the handle axis and the longitudinal axis intersect within the vacuum cleaner’ as claimed by limitation 1d.” POR, 41-42. PO misstates Petitioners’

argument; Petitioners do not argue that Dyson itself discloses these limitations; rather, Petitioners and Mr. Fester argue that the *modified device* – as opposed to Dyson on its own – would satisfy the claim limitations. As explained in the Petition and accompanying declaration, if the handle of the same vertical orientation of Dyson were applied to Conrad'630, the resulting handle of the modified device would meet these claim limitations. *See* Pet., 56-60. For example, Mr. Fester states that:

131. A POSITA *could have designed other handles* that attach to the vacuum cleaner of Conrad'630 and which incorporate the teachings of Dyson. *Such vacuum cleaners* would also fall within the scope of the challenged claims.

...

144. . . [A] POSITA would have designed a *combined handheld vacuum* that has a handle on the rear (as taught by Conrad'630), and which handle was shaped in a pistol grip configuration and which had an incline relative to the longitudinal axis that was within the specific range for angle θ (green) taught by Dyson, *which falls within the claimed range of claim 1*.

Ex-1003, ¶¶131, 144 (emphases added); *see also* Pet., 55, 58.

3. Both Conrad'630 and Dyson Would Have Motivated a POSITA to Combine

a) Conrad'630's Disclosures Motivate the Combination

As discussed in Section II.A.2(a), Conrad'630's own disclosures would have motivated a POSITA to incorporate the teachings of Dyson regarding its handle,

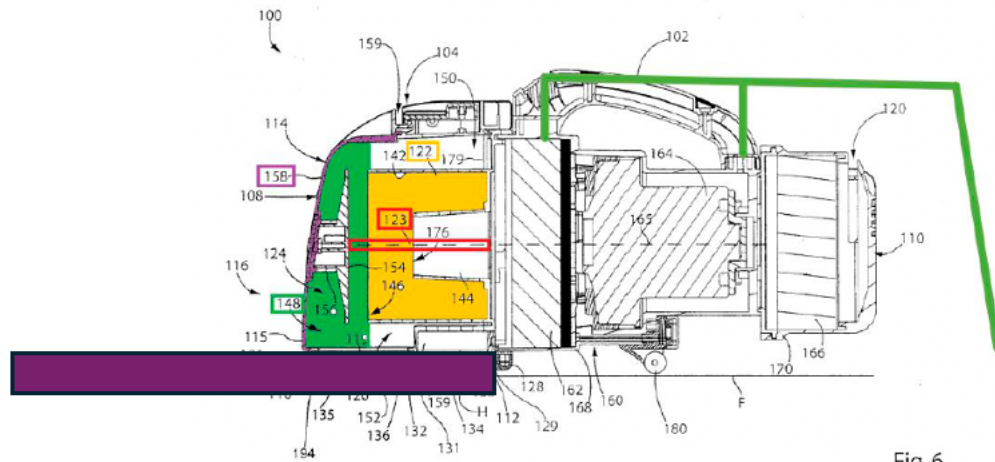
including to improve the operability of the Conrad'630 vacuum with attachments. Petitioners' arguments from Section II.A.2(a) are incorporated herein by reference.

b) Dyson's Disclosures Motivate the Combination

Dyson's own disclosures would have also motivated a POSITA to incorporate the teachings of Dyson regarding its handle into Conrad'630, including because a POSITA would have recognized that Dyson offers a more comfortable and ergonomic handle configuration. Ex-1003, ¶¶125-132.

PO argues that the "comfort of the handgrip depends upon the handle axis being transverse to the suction conduit," and that "the comfort of Dyson's handle in these disclosures depends upon Dyson's arrangement wherein the handgrip 28 lies transverse to the longitudinal axis Y-Y of the suction conduit." POR, 46, Ex-2017, ¶¶108-109 (citing EX-1007, 6:13-22). However, again, PO and Mr. Davidshofer ignore that Petitioners' combined device would be well suited for use with attachments, and in particular attachments that are attached directly to the nozzle 412 such as a crevasse tools. Pet., 24-27; Ex-1003, ¶¶69-72; Pet., 27; Ex-1003, ¶72; Ex-2018, 135:16-136:2, 91:14-22; Ex-1011, 80:1-81:1. As illustrated below, adding a crevasse tool (purple) to the vacuum of Conrad'630 would result in Conrad'630's nozzle axis shifting from the vertical axis to the horizontal axis. Moreover, the horizontal nozzle axis would be substantially transverse to the axis of the handle at

the rear of the vacuum. Such an arrangement is, as explained by Dyson, “comfortable for the user.” Ex-1007 at 6:16.



Mockup of Figure 6 of Conrad '630 to show an alternative design of the handle consistent with the teachings of Conrad '630 and Dyson.

Ex-1003, 65 (further annotated to add a crevasse tool (purple)).

By way of example, the Eureka OmniVerse vacuum shows the use case described above in a commercial embodiment of a handheld vacuum having a handle similar to the handle of the modified Conrad'630 vacuum. Ex-1013; Ex-1014 (illustrated below). As Mr. Davidshofer observed at his deposition, the user of the OmniVerse vacuum holds the vacuum at an “upwardly corner” of the handle in the picture showing the crevice tool attached. Ex-1011, 88:13-14. Moreover, as observed in the diagram below, the nozzle axis is substantially transverse to the axis of the handle at the rear, in the same way that the that the nozzle axis of the modified

Conrad'630, as shown above, is substantially transverse to the axis of the handle at the rear.



Ex-1014, 5, 8.

c) PO's Arguments That the Proposed Combination Is Inferior Fail

As discussed in Section II.A.2(c), PO and Mr. Davidshofer only identified deficiencies with their own proposed combination and failed to identify any reason why the combination proposed by Petitioners and Mr. Fester would not work. As such, PO's arguments regarding alleged deficiencies associated with Petitioners' modified Conrad'630 vacuum should be given no weight. Moreover, as discussed above, PO's arguments are also misleading because they fail to consider operational conditions in various use cases.

**C. GROUNDS 3 & 4: Matsumoto in View of Conrad'787 or Dyson
Render the Challenged Claims Obvious**

**1. PO Failed to Rebut the Motivation to Combine Matsumoto
With Conrad'787 or Dyson**

As explained in the Petition, a POSITA would have been motivated to “miniaturize the vacuum cleaner” of Matsumoto in order to operate it in a handheld configuration. Pet., 64; Ex-1003, ¶¶162-165. A POSITA “would have also recognized that Matsumoto’s handle is unergonomic and uncomfortable because of its shape and angle,” and that “Matsumoto’s handle would be likely to break because of its shape and because it acts as a cantilever that absorbs force during use.”⁴ Pet., 66; Ex-1003, ¶¶165-67. As such, a “POSITA would have therefore been motivated to implement use a more comfortable handle with Matsumoto’s vacuum,” such as the handles provided by Conrad'787 and Dyson. Pet., 66-67.

PO’s Response and expert confirm that the proposed modification of the handle of Matsumoto would result in a smaller, yet structurally more robust handle, which would increase the operability of the vacuum cleaner and reduce the risk of

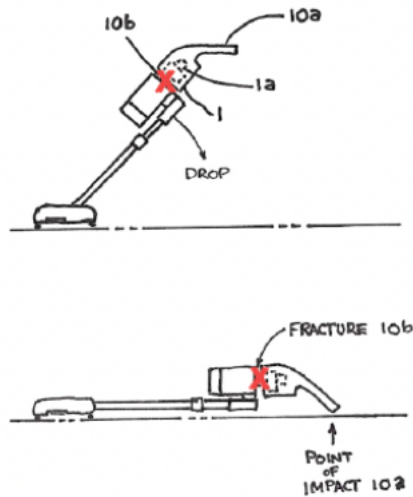
⁴ PO argues that that these statements are insufficient to meet Petitioners’ burden because they are “unsupported statements from” Mr. Fester. POR, 62-63. Not so. First, PO failed to provide any evidence that rebuts Mr. Fester’s opinion. Second, Mr. Fester is qualified to provide this opinion. He worked for a vacuum manufacturer for “11-ish years,” where he had “a recurring quality meeting” to discuss issues that causes failures and observed that “one of the issues that was predominant was failures of handles.” Ex-2018, 168:1-169:9. Third, Mr. Fester explained that Matsumoto’s handle “is essentially a cantilever absorbing the constant forces of the user’s hand.” *Id.*

the vacuum cleaner being fractured. Patent Owner arguments to the contrary are speculative and incorrect.

a) The Proposed Combinations Would Have Resulted in a Smaller But Structurally More Robust Handle

PO argues that Matsumoto teaches “reduc[ing] the space occupied by the handle,” Ex-1005, ¶68, whereas Petitioners’ proposed combination would result in a vacuum cleaner with a larger handle. POR 57-58, 60-62; Ex-2017, ¶¶129-31. That is incorrect. Mr. Davidshofer conceded at his deposition that—contrary to his declaration—the *original* handle of Matsumoto “appears to be *larger* in the X-axis” compared with the handle of the modified vacuum. Ex-1011, 100:13-19. Reducing the length of the handle would miniaturize the vacuum cleaner, which Matsumoto explains would “help reduce the space occupied by the handle,” making it “possible to miniaturize the vacuum cleaner and enhance the operability thereof.” Ex-1005, ¶68; Ex-1003, ¶¶162, 210; Pet., 64-65, 91-92.

Moreover, shortening the handle in the X-axis would also solve a problem identified in Mr. Davidshofer’s declaration with the Matsumoto vacuum; namely, that the vacuum is likely to fracture if it falls to the ground. Ex-2017, ¶¶140-41 (as illustrated by Diagram R, reproduced below). At his deposition, Mr. Davidshofer agreed that “using a handle that is shorter in length” would “reduce the risk of a fracture.” Ex-1011, 113:11-21.



R

Ex-2017, 71.

Finally, as Mr. Davidshofer explained at his deposition, the modified handle would also be “structurally more sound or robust,” while also being smaller in the X-axis, which would also solve a key problem identified by Mr. Fester that the original handle is likely to break. Ex-1011, 99:20-25; Ex-1003, ¶¶165-67.

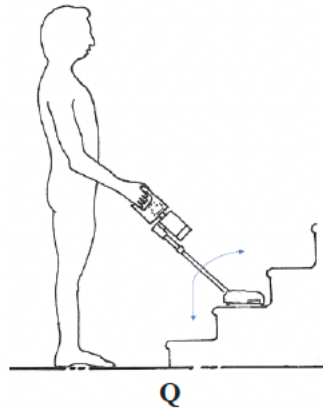
In summary, as Mr. Davidshofer agreed, the modified handle would be an improvement on the original handle because it saves space in the X-axis while being less likely to break, and also reduces the risk of the vacuum cleaner itself being fractured.

b) PO's Expert's Opinions About Discomfort Are Conclusionary

Mr. Davidshofer opines that a POSITA would have been led away from the proposed combination because the weight distribution of the modified vacuum cleaner would not be the same as in Conrad'787 or Dyson. Ex-2017, ¶¶133-135;

POR, 54. However, in coming to this conclusion, Mr. Davidshofer failed to consider that the “suction port 4 . . . would rest on the surface being cleaned during the operation,” even though at his deposition he agreed that “some weight would be supported by the floor.” Ex-1011, 109:23-110:25. Mr. Davidshofer's failure to account for how the weight of the vacuum would be supported is fatal to his conclusion that a “POSITA would not have expected success in replacing Matsumoto's handle.” Ex-2017, ¶135.

Mr. Davidshofer also opines, without support, that the proposed handle would “increase the stress on the user.” Ex-2017, ¶136. Mr. Davidshofer's opinion is conclusionary and fails to consider the circumstances of the use case. For example, he conceded that his sketch Q (Ex-2017 at 69, shown below) is “an arbitrary sketch,” and does not account for “the size of the vacuum relative to the size of the stairs.” Ex-1011, 112:2-5. He also failed to consider whether the individual's arm could be straightened—to reduce stress on the user—should the user change their position. *Id.*, 112:17-21.



Ex-2017, 69.

Mr. Davidshofer's conclusory opinions, based on no more than "10 or 12 hours" of work, should be afforded no weight. *Id.*

2. The Proposed Combination Satisfies the "Handheld" Preamble of Claim 1

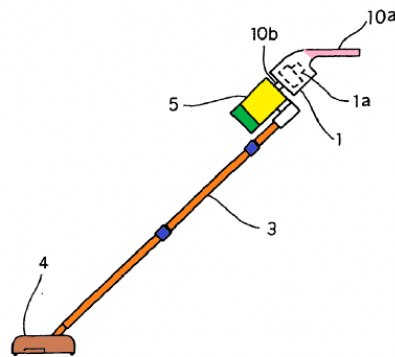
a) The "Handheld" Preamble of Claim 1 Is Not Limiting

PO argues that because Matsumoto does not explicitly disclose a "handheld" vacuum, "Petitioners' Grounds 3 and 4 require first showing that a POSITA would have been motivated to miniaturize Matsumoto to be useful for non-floor surfaces, like Conrad'787 and Dyson." POR, 57-58. Not so. As Petitioners showed in the Petition, the preamble of claim 1 is not limiting. Ex-1001, cl. 1; Ex-1003, ¶172; Pet., 70. Moreover, at his deposition, Mr. Davidshofer reviewed claim 1 and determined that the claim "could possibly not be limited to a handheld vacuum," and that there are vacuums that "have these same features" but which "would not be considered a handvac." Ex-1011, 94:22-95:3.

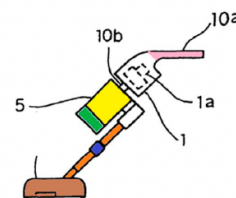
b) A POSITA Would Have Understood That Matsumoto Discloses Miniaturizing Its Vacuum Cleaner

Even if the preamble were limiting, a POSITA would have understood that Matsumoto discloses a vacuum that could be used as a handheld vacuum. Ex-1003, ¶173; Pet., 70. A POSITA would have understood that Matsumoto illustrates a vacuum with connection pipes 3 (orange) connected to one another with collars (blue), which would allow the vacuum cleaner to be miniaturized. Ex-1003, ¶¶163-164.

FIG. 25



Ex. 1005, Fig. 25 (annotated).



Mockup of Matsumoto's Figure 25 to show use of Matsumoto's vacuum as a handheld.

Ex-1003, 78-79.

PO argues that a POSITA would not understand the blue features to be “collars,” but rather, they would understand them to be “physical friction-fit interfaces, physical bayonet mount interfaces.” Ex-2017, ¶124; POR, 59. This is a distinction without a difference, as “friction-fit interfaces” and “physical bayonet mount interfaces” would still allow the vacuum to be miniaturized and used as a handheld. Mr. Davidshofer explained that “physical fit interfaces” allow for

temporarily “attaching two or more” connection pipes. Ex-1011, 96:26-98:7. He also explained that a “bayonet mount is a rotatable feature that once engaged, you rotate for a locking mechanism,” and would support a “removable” attachment mechanism. *Id.* at 98:22-99:11. In other words, both attachment mechanisms that Mr. Davidshofer identified in his declaration would support the use of the vacuum as a handheld.

Thus, PO's expert concedes that the preamble is not limiting, and in any event, a POSITA would have understood that the Matsumoto vacuum can be used as a handheld vacuum.

3. Petitioners Showed That the Combination Discloses Limitation 1d and Claim 2 in Ground 4

PO argues that Petitioners have not shown that limitation 1d and claim 2 are taught by the proposed combination. POR, 68-69. Not so. As with Ground 2 (*supra*, Section II.B.2), the Petition and Mr. Fester explain that the “***combined vacuum*** inherently discloses a handle that falls within the claimed angle range of Element 1[d],” and that “in the ***proposed combination***, the handle axis (purple) and the longitudinal axis (red) intersect within the vacuum cleaner.” Ex-1003, ¶¶227-28, 232; Pet., 94-96. Petitioners specifically argued “the ***proposed combination*** of Matsumoto with [Dyson] meets this limitation.” Pet., 97, 80-83. Thus, PO's argument fails.

III. THERE ARE NO RELEVANT SECONDARY CONSIDERATIONS

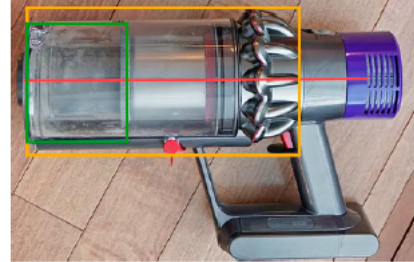
PO argues praise associated with the Dyson V10 vacuum's "point-and-shoot" feature evidences a secondary consideration of non-obviousness. POR, 69-76. PO further contends that the point-and-shoot feature is reflected in limitations 1c and 1d. POR, 70. Not so. The "point-and-shoot" feature is the feature associated with the dustbin configuration of the Dyson V10 and the only relevant feature is reflected in limitation 1c concerning the dustbin, which is in the prior art. POR, 70.

To support its conclusion, PO relies exclusively on a single paragraph of Mr. Davidshofer's declaration. *Id.* (citing Ex-2017, ¶174). Mr. Davidshofer, in turn, merely states, without any analysis, that the "point-and-shoot feature is accomplished through a combination of two of the limitations," limitation 1c (relating to the dustbin) and 1d (relating to the handle). *Id.* However, upon examination, the press articles that PO cites describe the point-and-shoot feature as relating solely to the dustbin, rather than the handle. Ex-2022, 4 ("The dustbin now empties from the front, not the bottom like the old model."); Ex-2023, 3 ("In this new design, the bin faces forward, whereas every previous Dyson handheld had it facing downward, just in front of the trigger handle."). As Ex-2023 explains, the key "improvement" in the Dyson V10 is that the dustbin "faces forward," instead of "downward," as in the prior art vacuums such as the Dyson V6 (shown below), and

the vacuum in the Dyson reference. *See* Ex-1007; Ex-1011, 45:14-19. Notably, the handle configuration remained the same between the Dyson V6 and V10 vacuums.



Dyson V6 (DC58) Handheld Vacuum Cleaner.



**Closed Configuration
EX-2021 (annotated)**

Ex-1003, 5 (Dyson V6); POR, 72 (Dyson V10).

Importantly, the dustbin configuration (limitation 1c) was known in the prior art, including Conrad'630 and Matsumoto. Ex-1003, ¶¶34-35, 39, 86-87, 181-83. Thus, PO failed to meet its burden in showing that the secondary considerations are “a direct result of the unique characteristics of the claimed invention.” *Volvo Penta of the Amers., LLC v. Brunswick Corp.*, 81 F.4th 1202, 1210 (Fed. Cir. 2023). Moreover, there are no relevant secondary considerations here. Ex-1003, ¶¶243-245.

IV. CONCLUSION

The Challenged Claims should be canceled.

DATED: August 14, 2024

By: /Brian M. Buroker/

Brian M. Buroker (Reg. No. 39,125)
GIBSON, DUNN & CRUTCHER LLP
1050 Connecticut Ave. NW
Washington, DC 20036
Phone: (202) 955-8500
Fax: (202) 467-0539
Email: bburoker@gibsondunn.com

*Attorney for Petitioners SharkNinja Inc.,
SharkNinja Operating LLC, SharkNinja
Management LLC, and SharkNinja Sales
Company*

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 the word count for Sections I–IV of the foregoing Reply to Patent Owner's Response is 5,596, according to the word count tool in Microsoft Word.

DATED: August 14, 2024

By: /Brian M. Buroker/

Brian M. Buroker (Reg. No. 39,125)
GIBSON, DUNN & CRUTCHER LLP
1050 Connecticut Ave. NW
Washington, DC 20036
Phone: (202) 955-8500
Fax: (202) 467-0539
Email: bburoker@gibsondunn.com

*Attorney for Petitioners SharkNinja Inc.,
SharkNinja Operating LLC, SharkNinja
Management LLC, and SharkNinja Sales
Company*

CERTIFICATE OF SERVICE

The undersigned certifies service pursuant to 37 C.F.R. § 42.120 of a copy of this Reply to Patent Owner's Response, and Exhibits 1011, 1012, 1013, and 1014 upon Patent Owner by email on August 14, 2024, to the following email addresses of record:

DysonIPR@kirkland.com

christian.huehns@kirkland.com

matt.hershkowitz@kirkland.com

jay.emerick@kirkland.com

caitlin.dean@kirkland.com

DATED: August 14, 2024

By: /Brian M. Buroker/

Brian M. Buroker (Reg. No. 39,125)
GIBSON, DUNN & CRUTCHER LLP
1050 Connecticut Ave. NW
Washington, DC 20036
Phone: (202) 955-8500
Fax: (202) 467-0539
Email: bburoker@gibsondunn.com

*Attorney for Petitioners SharkNinja
Inc., SharkNinja Operating LLC,
SharkNinja Management LLC, and
SharkNinja Sales Company*