

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

SUR-REPLY TO PETITIONER'S REPLY

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<i>In re Kahn</i> , 441 F.3d 977 (Fed. Cir. 2006)	14, 15

PATENT OWNER'S EXHIBIT LIST

Exhibit	Description
2001	U.S. Patent Publication No. 2017/0071426 A1 (“Krebs”)
2002	GB 2440111B
2003	Chinese Patent Application No. 201610830364.1
2004	Chinese patent document no. CN1178622C
2005	China National Intellectual Property Administration, Case No. 114231 (Oct. 19, 2022) translation
2006	China National Intellectual Property Administration, Case No. 4W114231 (Oct. 19, 2022) translation
2007	The People’s Republic of China Beijing Intellectual Property Court Administrative Judgment (Oct. 25, 2023) original
2008	The People’s Republic of China Beijing Intellectual Property Court Administrative Judgment (Oct. 25, 2023) translation
2009	U.S. Patent Application Publication 2016/0150923 A1 (“Conrad ’923”)
2010	U.S. Patent No. 8,156,609 (“Milne”)
2011	Chinese patent document no. CN101489454A
2012	Chinese patent document no. CN1361673A
2013	China National Intellectual Property Administration Case No. 4W114082 (sept. 23,2022) original
2014	China National Intellectual Property Administration, Case No. 4W114082 (Sept. 23, 2022) translation
2015	U.S. Patent No. 1,871,624 (“the ’624 patent”)
2016	Declaration of Brianna Lynn Silverstein in Support of Motion for Pro Hac Vice Admission
2017	Declaration of Donald J. Davidshofer
2018	Deposition Transcript of Joseph Fester (Apr. 26, 2024)
2019	U.S. Patent No. 8,789.235 (“the ’235 patent”)
2020	https://www.dyson.com/vacuum-cleaners/cordless/v10/shop-all (accessed May 7, 2024)
2021	Dyson’s Pricey Cordless Vac is So Good, It’s Killing Cords Altogether, Mar. 8, 2018, available at https://gizmodo.com/dysons-pricey-cordless-vac-is-so-good-its-killing-cord-1823469578 (accessed May 7, 2024)
2022	Dyson Cyclone V10: Seriously powerful cordless vacuum starts at \$500, Mar. 5, 2018, available at

Exhibit	Description
	https://www.cnet.com/reviews/dyson-cyclone-v10-absolute-preview/ (accessed May 7, 2024)
2023	Dyson Cyclone V10 vacuum review: Bigger isn't always better, Mar. 6, 2018, available at https://web.archive.org/web/20180306235846/https://mashable.com/2018/03/06/dyson-cyclone-v10-review/#nWCAg.es4kqi (accessed May 7, 2024)
2024	Dyson to go all cordless with vacuums, starting with the Cyclone V10, Mar. 6, 2018, available at https://www.engadget.com/2018-03-06-dyson-cyclone-v10-vacuum-cordless-handheld.html (accessed May 7, 2024)
2025	Dyson is done with corded vacuums as the powerful Cyclone V10 looks to clean up, Mar. 6, 2018, available at https://www.techradar.com/news/the-dyson-cyclone-v10-wants-to-clean-up-on-powerful-cordless-vacuums (accessed May 7, 2024)
2026	Declaration of Jay Emerick in Support of Patent Owner's Unopposed Motion for Pro Hac Vice Admission of Jay Emerick

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)
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
POSITA	person of ordinary skill in the art

I. INTRODUCTION

Petitioners have failed to meet their burden of establishing by a preponderance of the evidence that the challenged claims should be canceled as unpatentable. All grounds fail because Petitioners' proposed modifications to Conrad '630 and Matsumoto result in vacuums with inferior weight balance that increases wrist, elbow, and arm strain and are contrary to the teachings in Conrad '787 and Dyson. Rather than address the merits of Dyson's arguments, Petitioner's reply merely reiterates its Petition and focuses on baseless attacks on the analysis performed by Dyson's expert, Mr. Donald Davidshofer. For at least the reasons set forth below, Dyson requests that the Board confirms patentability of the challenged claims.

II. GROUNDS OF ALLEGED UNPATENTABILITY

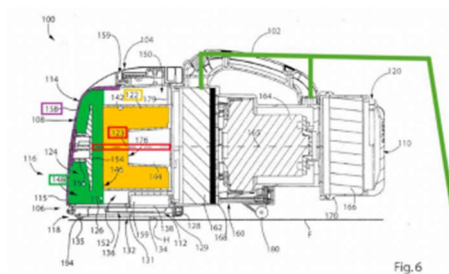
A. GROUND 1: Petitioners Fail to Show Conrad '630 in View of Conrad '787 Would Render the Challenged Claims Obvious

Petitioners' proposed combination of Conrad '630 and Conrad '787 results in a vacuum with inferior weight balance that increases wrist, elbow, and arm strain during typical use situations. Such a combination is contrary to the general knowledge of a POSITA and the teachings of Conrad '630 and Conrad '787.

1. PO's Expert Specifically Addresses Petitioners' Proposed Combination of Conrad '630 and Conrad '787

Petitioners argue that it and its expert "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," and that PO and Mr. Davidshofer

“essentially ignore[d] the proposed combination.” Paper No. 30 at 2. That simply ignores nearly 30 pages of PO’s Response (“Paper No. 20”), and over 20 pages of Mr. Davidshofer’s declaration addressing this combination. *See, e.g.*, Paper No. 20 at 13-40; EX-2017 ¶¶ 49-98. With respect to Petitioners’ mock-ups, PO and its expert directly addressed these too, even going so far as to include images of each of Petitioners’ proposed mock-ups and discussing them in its Response and Mr. Davidshofer’s declaration. Paper No. 20 at 16, 37-38; EX-2017 ¶¶ 53-54, 92-98. Petitioners point to one mock-up in particular from paragraph 75 of Mr. Fester’s declaration as allegedly unaddressed:



Paper No. 30 at 3-4. But PO’s expert *specifically reproduces* this figure in his declaration at ¶¶ 53, 93, and 94, and PO reproduces it in its PO response at page 16—which is more than Petitioner, who never even included the figure in its petition. Paper No. 20 at 16; EX-2017 ¶¶ 53, 93, and 94. Petitioners’ allegations that PO has not addressed its combination or mock-ups are plainly false.

Further, PO’s Response directly addresses the merits of Petitioners’ proposed handle replacement. As just one of many examples, PO argues that “[f]unctionality

and useability of Conrad '630 would be diminished with Conrad '787's handle." Paper No. 20 at 15. Mr. Davidshofer explains that his analysis considers "Conrad '787's or Dyson's handle" based on the fact that Petitioners' expert Mr. Fester's "declaration states that Conrad '787's or Dyson's handle will replace Conrad '630's handle and relies exclusively on the Conrad '787's or Dyson's handles for the claimed 'handle.'" EX-2017 ¶ 49. That PO additionally included and discussed its own mock-ups to further illustrate the lack of motivation to combine these reference does not diminish—and only enhances—its response to Petitioner's mock-ups and arguments.

2. Neither Conrad '630 nor Conrad '787 Would Have Motivated a POSITA to Combine the References as Proposed by Petitioner

a. Conrad '630's Disclosures Do Not Motivate the Combination

Petitioners rely heavily on a single sentence in Conrad '630 that recites, "handle 102 may be provided elsewhere on the vacuum cleaner 100, for example at the rear 110 and may be of any design" to argue that Conrad '630 would have motivated a POSITA to make their proposed combination. Paper No. 2; Ex-1003 ¶ 65. However, as Mr. Davidshofer explained, the arm and wrist strained by increased torque created by Petitioners' proposed combination of Conrad '787's handle at Conrad '630's rear would have led a POSITA *away* from Petitioners' proposed combination. EX-2017 ¶ 52. Petitioners repeat its claim that PO has not addressed

its proposed combinations, Paper No. 30 at 7, but for the reasons in Section II.A.1, that is demonstrably false.

Petitioners argues that PO's arguments are inconsistent with its arguments in IPR2024-01151, where a handle substitution "would achieve the predictable results of *increased* maneuverability and ergonomics," Paper No. 30 at 7, but there is no inconsistency because there, the proposed modification would have improved ergonomics, whereas here, the proposed modification would worsen ergonomics resulting in a vacuum with inferior weight balance that increases wrist, elbow, and arm strain. Paper No. 20 at 15-19.

Petitioners next make personal attacks on PO and Mr. Davidshofer, arguing they "fail to comprehend" that "the vacuum of Conrad '630 can be used with attachments other than hoses" such as "wands, brushes and crevasse tools," Paper No. 30 at 7-8, but cites to no evidence in Conrad '630 itself of any such "wands, brushes and crevasse tools," and instead relies on another reference, Conrad '663, that is not part of its proposed combination and for which Petitioners and their expert provide no motivation to combine whatsoever in their Petition. Even so, PO's arguments and its expert's opinions regarding ergonomics and weight balance apply equally—or are even stronger—if a wand or crevasse tool is attached directly to Conrad '630, because that only increases the torque on a user's wrist. Paper No. 20 at 15-19, EX-2017 ¶¶ 52-56.

Petitioners argue that its proposed combination would be “vastly superior” “because it would offer more flexibility and optionality” and is “without rebuttal from PO.” Paper No. 30 at 8-9. Petitioners simply ignore Mr. Davidshofer’s explanation for why the alleged disclosed combination of Conrad ’630 and Conrad ’787 would not have been obvious or desirable to a POSITA by emphasizing the “optionality” of orientation over concerns of user experience and comfort. *See* Paper No. 30 at 4-5. Specifically, Petitioners allege that Mr. Davidshofer “agreed that for handheld vacuum cleaners . . . ***the orientation is conducive to the matter that you’re picking up and where it is***” and that he further “conceded that it would be possible to keep the original handle and add a modified handle” while maintaining the advantages of the original handle. Paper No. 30 at 5 (emphasis in original). But this misconstrues Mr. Davidshofer’s testimony:

Q. Are there any advantages to keeping both [handles]?

A. I don’t see an advantage.

Q. Would keeping the original handle while adding a second handle, alternative handle . . . maintain the advantages of the original handle?

A. With the exception of ***adding cost, weight, and packaging, yes.***

EX-1011, 64:9-16 (emphasis added). He does *not* concede that redesign with both an original and a modified handle would be purely advantageous, instead stating that there would be concerns over “add[ed] cost, weight, and packaging.” EX-1011, 64:15-16; *see also id.*, 64:17-25.

b. Conrad '787's Disclosures Do Not Motivate the Combination

Petitioners similarly disregard Dyson's argument that Conrad '630 and Conrad '787 disclose vacuums with distinct functions. Conrad '630 discloses cleaning a surface by a nozzle positioned at the vacuum's "bottom" and is "moveable along a surface to be cleaned by gripping and maneuvering handle," with optional front wheels and rear wheels on the "bottom" contacting the surface. EX-1004 ¶¶ 52, 54, 67; EX-2017 ¶ 59. In contrast, Conrad '787 discloses a "handvac" that entails more flexible user orientation. EX-1006 ¶ 311; EX-2017 ¶ 60. Thus, the disclosures of vacuum features such as handle positioning, nozzle entrance, and manipulation of the vacuum during use are substantially different between Conrad '630 and Conrad '787 and would not have motivated a POSITA to simply substitute one handle for another as proposed by Petitioner. EX-2017 ¶ 61.

Petitioners further argue that Conrad '787's disclosures regarding comfort would have motivated a POSITA to apply the teachings of Conrad '787 to extend the handle of Conrad '630 rearwardly to "offer more flexibility and optionality in holding the vacuum." Paper No. 30 at 9. But Conrad '787 itself emphasizes the importance of having the "center of gravity . . . aligned vertically *below the user's hand.*" EX-1003, ¶ 46 (citing EX-1006, ¶ 314) (emphasis added). As Mr. Davidshofer explains, Petitioners' proposed combination of using Conrad '787's handle at the rear creates "*greater torque* on the user's hand than Conrad '630's

vacuum,” which expressly contradicts the purpose of Conrad ’787’s vacuum handle being one that may be “comfortably operated.” EX-2017, ¶¶ 63-64 (emphasis added). Petitioners again ignore the drawbacks of adding handle positions: there is “add[ed] cost, weight, and packaging,” EX-1011, 64:15-16, and Petitioners have not shown and cannot show that these and other drawbacks associated with their proposed modification outweigh the alleged benefits. Conrad ’630 itself states that one of its goals is *simplicity*, stating that “[a]ccording to another broad aspect, a hand surface cleaning apparatus is disclosed that is easier to clean and *has a simplified structure*.” EX-1004 at ¶ 17 (emphasis added). Petitioners’ proposal to complicate Conrad ’630 with additional handle positions is counter to Conrad ’630’s express teachings and goals of a “simplified structure.”

c. Petitioners Fail to Address the Ways in which the Proposed Combination Is Inferior

Petitioners attempt to evade Mr. Davidshofer’s identification of the ways in which their proposed combination is inferior by arguing that Mr. Davidshofer does not analyze their proposed combination. *See* Section II.A.1. Further, Mr. Davidshofer explains that certain of his analysis considers “Conrad ’787’s or Dyson’s handle” based on the fact that Petitioners’ expert Mr. Fester’s “declaration states that Conrad ’787’s or Dyson’s handle will replace Conrad ’630’s handle and relies exclusively on the Conrad ’787’s or Dyson’s handles for the claimed ‘handle.’” EX-2017 ¶ 49. This is the proper analysis and ultimately, he opines in

detail that Petitioners' proposed combination would result in, for example, reduced efficiency and poorer cleaning performance. EX-2017 ¶¶ 92-98.

In response, Petitioners allege that 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," but that is another misrepresentation of testimony. Paper No. 30 at 15 (citing EX-1011, 92:22-94:4). Again, this misconstrues Mr. Davidshofer's testimony in which he explained that the reduced efficiency and poorer cleaning performance would not apply "to the extent it would [] as if the handle was in a rearward position." EX-1011, 93:2-3.

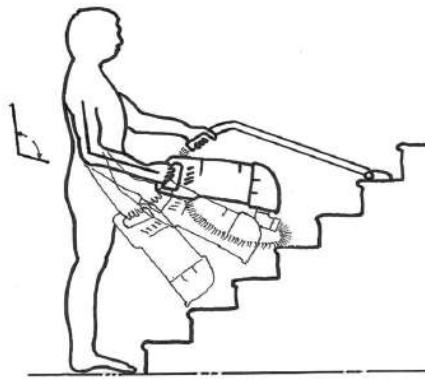
Further, contrary to Petitioners' representations, Mr. Davidshofer also did not "eventually concede[] that the vacuum would rest on the surface to be cleaned . . . [which] would support the weight of the vacuum, thereby reducing the stress on the user's wrist." Paper No. 30 at 12. Instead, Mr. Davidshofer merely noted that the surface *could* "bear some of the weight of the vacuum." EX-1011, 69:19-22.

Petitioners also argue that increased arm and hand stress resulting from operating Conrad '630 with a hose attachment and a rear handle is "nonsensical" because the "vacuum weighs the same whether oriented horizontally or vertically." Paper No. 30, 13-14. But Petitioners disregard the fact that the repeated movement of folding the arm up to *lift* the vacuum to avoid hitting the stairs as one cleans them

is what causes stress, not strictly the weight of the vacuum itself. *See* EX-2017 ¶ 80.

As Mr. Davidshofer explained:

“In the vertical position, the lowest portion of the vacuum cleaner is at a lower elevation requiring the user to lift the device more often to avoid contact with stairs or furniture when moving around to clean. This **lifting action** would **increase user arm/hand stress** (*see* illustration K below).”



K

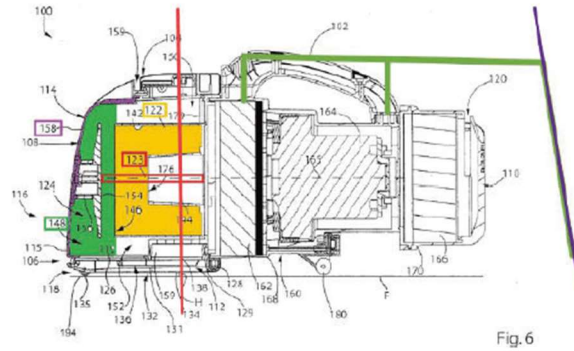
EX-2017 ¶ 80 (emphasis added). Petitioners ignore the drawback of adding handle positions to Conrad ’630, including there is “add[ed] cost, weight, and packaging,” and frustrating Conrad ’630’s goal of a vacuum with a “simple structure.” *See* Section II.A.2.b.

B. GROUND 2: Petitioners Fail to Show that Conrad ’630 in View of Dyson Render the Challenged Claims Obvious

1. PO Addresses Petitioners’ Proposed Combination of Conrad ’630 and Dyson

Contrary to Petitioners’ allegations, Mr. Davidshofer properly addressed Petitioners’ Proposed Combination of Conrad ’630 and Dyson. *See supra*, Section

II.A.1.; Paper No. 20 at 40-52; EX-2017 ¶¶ 99-117. For example, Mr. Davidshofer’s report specifically discusses this combination including reproduction of figures from the Petition with annotations added:



EX-1003 ¶130 (further annotated)

EX-2017 ¶¶ 111-113.

2. Petitioners Have Not Shown That the Combination Discloses Limitation 1d and Claim 2

Petitioners fail to show that the prior art discloses the limitations of claims 1d and 2. For the limitations of both claims 1d and 2, Petitioners rely exclusively on Dyson. *See* Paper No. 2 at 56. For example, for limitation 1d, the Petition notes that “Conrad ’630 discloses one embodiment where handle 102 is mounted on an upper portion of vacuum clean . . . but does **not explicitly disclose a ‘pistol grip configuration’ as claimed. . . . Dyson discloses this limitation.**” Paper No. 2 at 56 (emphasis added). Similarly, for claim 2, the Petition notes that “Dyson discloses this limitation.” Paper No. 2 at 59.

With respect to the limitation of claim 1d, Petitioners contend that Dyson discloses a pistol handle that discloses a “handle axis X-X (purple) and the longitudinal axis Y-Y (red) [that] intersect within the vacuum cleaner.” Paper No. 2 at 58; EX-1003, ¶ 143. But Mr. Fester admits that Dyson alone does not disclose a handle axis that intersects with the longitudinal axis within the vacuum cleaner, as claimed by limitation 1d—instead, they are situated perpendicularly. EX-2018 at 157:11-21. Mr. Fester additionally conceded that the calculations relating to claimed handle angle incline for the limitations of claim 1d and 2 are not met solely based on the disclosures of Dyson. *Id.* at 157:22-158:4.

Indeed, Petitioners’ only counter to this point is to backtrack and claim that “Petitioners and Mr. Fester argue that the *modified device*—as opposed to Dyson on its own—would satisfy the claim limitations.” Paper No. 30 at 17. But given Mr. Fester’s express statements that Dyson alone is assessed for teachings specific to the limitations of claim 1d and 2, along with Mr. Fester’s admissions that Dyson’s teachings on their face do not meet the limitations of the ’687 Patent, Petitioners have not established that the limitations of claim 1d and 2 are disclosed in Conrad ’630 or Dyson. Even if Petitioners had pointed to the “modified device” as disclosing this limitation, that only underscores that neither reference discloses that “the handle axis and the longitudinal axis intersect within the vacuum cleaner,” and provides no

support for why a POSA would have arranged parts from the prior art such that these axes intersect within the vacuum cleaner.

Petitioners next point to paragraph 131 of Mr. Fester’s declaration, where he opines that “[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.” Paper No. 30 at 17 (emphasis in original) (quoting EX-1003 at ¶¶ 131, 144; Paper No. 2, 55, 58). But “obviousness concerns whether a skilled artisan *not only could have made but would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.” *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015). Mr. Fester’s opinions about what a POSA “could have” done are irrelevant and insufficient to show a motivation to combine.

3. Petitioners Fail to Show that Conrad’630 and Dyson Would Have Motivated a POSITA to Combine

a. Conrad ’630’s Disclosures Do Not Motivate the Combination

As discussed above in Section II.A.2.a, Petitioners have not shown that Conrad ’630 motivated a combination with Dyson as proposed by Petitioners to arrive at the claimed invention.

b. Dyson’s Disclosures Do Not Motivate the Combination

Dyson’s disclosure of a comfortable handle “depends upon Dyson’s arrangement wherein the handgrip 28 lies transverse to the longitudinal axis Y-Y of the suction conduit.” EX-2017 ¶ 109. Specifically, Dyson discloses that a transverse arrangement of the longitudinal axis of the suction conduit with respect to the handle axis is important to enable comfortable user experience in manipulating a hand-held vacuum cleaner. EX-2017 ¶ 109 (citing EX-1007, 6:13-22).

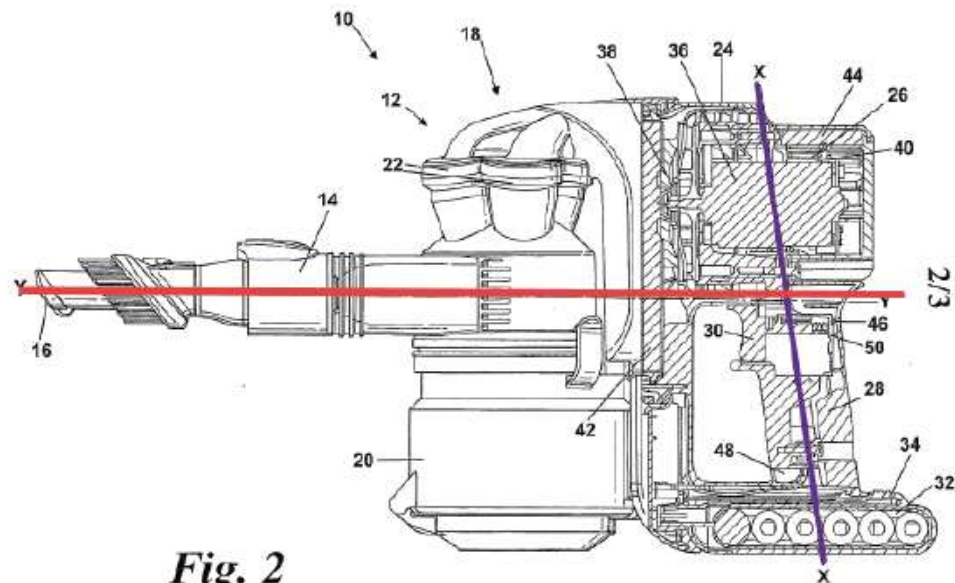


Fig. 2

EX-1007 Fig. 2 (annotated)

In contrast, Petitioners’ proposed modification to the handle of Conrad ’630 does not have an axis transverse to the suction conduit. EX-2017, ¶ 108. Petitioners attempt once again to backtrack by claiming that “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.” Paper No. 30 at 18-19 (mockup figure shown

below on left). Petitioners do so without citing to any evidence in Conrad '630 itself of any such wands or crevasse tools, and Conrad '663, a reference that is not part of any of Petitioners' proposed combinations, discloses a wholly distinguishable crevasse tool that is only illustrated as a distinct wand attachment. *See* EX-1008, 10:66-11:2 (noting crevasse tool 112 in FIG. 33, shown below on right).

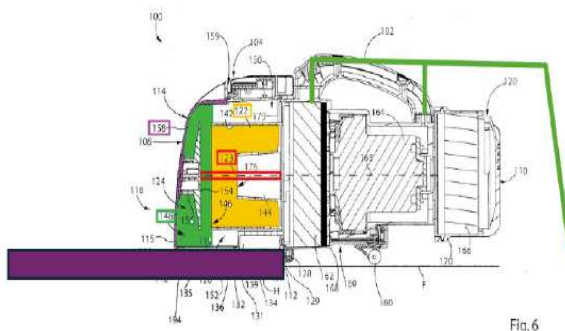


Fig. 6

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)).

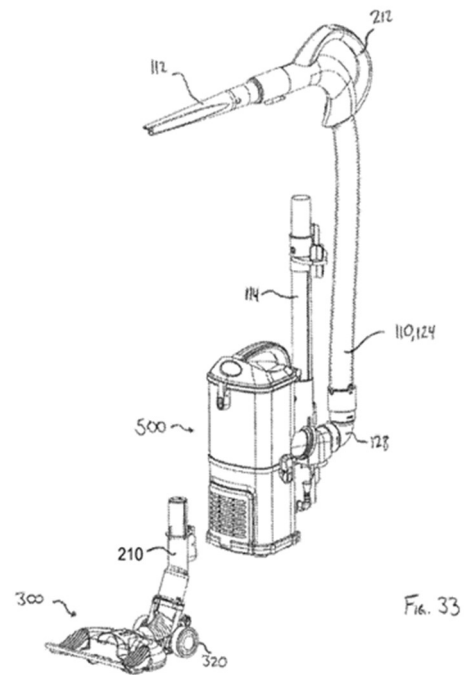


Fig. 33

Accordingly, Petitioners' proposed modification is merely impermissible hindsight. *See, e.g., In re Kahn*, 441 F.3d 977, 986 (Fed. Cir. 2006) (holding that where motivation is not explained at the time of the invention, the court infers that hindsight was improperly used to conclude that the invention was obvious); *InTouch Techs, Inc. v. VGO Commc'ns, Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014) (emphasizing

that motivation to combine prior art must be assessed from the perspective of “one of ordinary skill in the art *at the time of the invention*”).

Lastly, Petitioners point to the Eureka OmniVerse vacuum as a “commercial embodiment of a handheld vacuum having a handle similar to the handle of the modified Conrad ’630 vacuum.” Paper No. 30 at 19. But the Eureka OmniVerse is not Conrad ’630 and is therefore inapposite. Regardless, it would be of no help to Petitioners: Petitioners’ reliance on what appears to be a 2024-release commercial device only illustrates that its combination is pure hindsight. *See, e.g., In re Kahn*, 441 F.3d 977 at 986; *InTouch Techs.*, 751 F.3d at 1352.

c. Petitioners Fail to Address the Ways in which the Proposed Combination Is Inferior

Petitioners again fail to address the ways in which the proposed combination is inferior, for the same reasons given in Section II.A.2.c.

C. GROUNDS 3 & 4: Matsumoto in View of Conrad ’787 or Dyson Do Not Render the Challenged Claims Obvious

1. Petitioners Failed to Show the Motivation to Combine Matsumoto with Conrad ’787 or Dyson

Petitioners have not shown a person of skill in the art would have been motivated to combine Matsumoto with Conrad ’787 or Dyson to reach the claimed invention.

Petitioners do not dispute that “neither Matsumoto itself nor Conrad ’787 or Dyson identify *any* issues with Matsumoto’s handle.” Paper No. 30 at 62. Petitioners

also do not identify any prior art references showing issues with Matsumoto's handle. Instead, Petitioners' reply confirms that while it is Petitioners' burden to show motivation to combine, Petitioners rely on nothing more than Mr. Fester's own alleged experience and provide no substantive support from the prior art. *See* Paper No. 30 at 21 n.4 (listing Mr. Fester's work experience and simply stating "Mr. Fester *explained* that Matsumoto's handle 'is essentially a cantilever . . .'" (emphasis added)). But despite what Mr. Fester "explained" now, no prior art reference raised by Petitioners identified any issues with Matsumoto's handle. At bottom, Petitioners have no evidence of an alleged "problem" with Matsumoto's handle that would motivate a POSA to seek a replacement.

Petitioners also have not shown that a POSA would have been motivated to combine Conrad '787 or Dyson with Matsumoto. As PO argues, and Petitioners do not deny: "Mr. Fester agreed that his and Petitioners' alleged deficiencies in Matsumoto's handle . . . could have been rectified by replacing Matsumoto's handle with a handle other than Conrad '787's or Dyson's handle." Paper No. 20 at 64. Petitioners also have no response to Patent Owner's position that "Conrad '787's and Dyson's disclosures that Petitioners rely upon are irrelevant to Matsumoto's vacuum." *Id.* Notably, Petitioners do not deny that "in Matsumoto, the relationship between the handle axis and the suction port is not static and can fluctuate depending upon the angle of the connection pipe," or that Mr. Fester acknowledged that the

alleged benefits associated with Conrad '787 or Dyson “are dependent upon a static relationship between the handle axis and other portions of the vacuum cleaner.” *Id.* at 64–65.

Moreover, Petitioners’ alleged deficiencies of the Matsumoto handle and alleged benefits associated with Conrad '787’s or Dyson’s disclosures do not directly relate to the claim limitations in the '687 patent or the empirical problems that the claimed invention aims to solve, which is to reduce the amount of dust and other particles released into the air when the dirt collector was opened, and to provide a more ergonomic design for users when emptying the dirt collector. As Dyson and Mr. Davidshofer pointed out, “[t]his advantage cannot be accomplished in Petitioners’ and Mr. Fester’s modification of Matsumoto with Conrad '787’s or Dyson’s handle because the nozzle port 4 and connection pipe 3 extends beyond the wall of the dust collecting chambers.” Ex-2017 at ¶145; *see also* Paper No. 20 at 67. Petitioners have not shown otherwise.

Even assuming a person of skill in the art would have combined Matsumoto with Conrad '787 or Dyson, Petitioners are wrong that the proposed combinations would have resulted in a smaller but structurally more robust handle. Petitioners allege that “Mr. Davidshofer conceded . . . the original handle of Matsumoto ‘appears to be larger in the X-axis’ compared with the handle of the modified vacuum,” but Petitioners ignore that a vacuum handle is not one-dimensional and

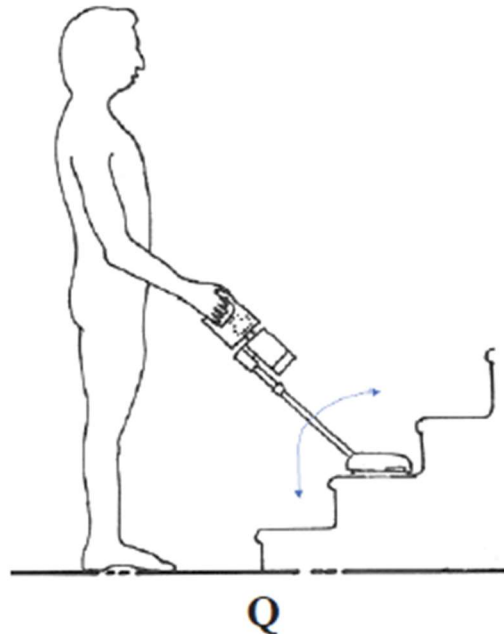
the length in one axis does not represent the overall mass and volume of the handle. Paper No. 30 at 22 (emphasis omitted). As Mr. Davidshofer illustrates, Matsumoto has overall a slimmer and less bulky handle than Petitioners' proposed combinations, which has various benefits including reducing weight-in-hand and storage space required:

See Ex-2017 at ¶¶ 129–130.

change in handle type, including strengthening the handle, shortening it, adding a shock-absorbing feature on the end, such as a piece of rubber, or countless other solutions that would have been simpler and less expensive than a wholesale design change and that would preserve the form and function of Matsumoto's original handle.

Further, contrary to Petitioners' assertion, Mr. Davidshofer's opinion that a person of skill in the art would have been led away from Petitioners' proposed handle is not conclusory. For example, Petitioners wrongfully allege that "Mr. Davidshofer failed to consider that the 'suction port 4 . . . would rest on the surface being cleaned during the operation.'" Paper No. 30 at 24. But Mr. Davidshofer testified regarding his opinion "as to which portion of the vacuum interfaces with the surface to be cleaned," and was able to answer questions of whether the suction port would rest on the surface to be cleaned and whether the weight of the vacuum would be supported by the surface. *See* Ex-1011, 110:6–25. Moreover, even where the weight of the vacuum would be partially supported by the surface to be cleaned, a person of skill in the art reading Dyson would have understood that compared to a handle where the remaining weight of the vacuum is borne solely on one side of the user's hand, a handgrip configured to ensure the weight is distributed on both sides of the user's hand would be more ergonomic and preferable. *See* Paper No. 20 at 54.

Petitioners further criticized Mr. Davidshofer’s opinion that the proposed handle would increase the stress on the user. Paper No. 30 at 24. Specifically, Petitioners allege that Mr. Davidshofer’s diagram Q is “arbitrary” and “does not account for ‘the size of the vacuum relative to the size of the stairs.’”

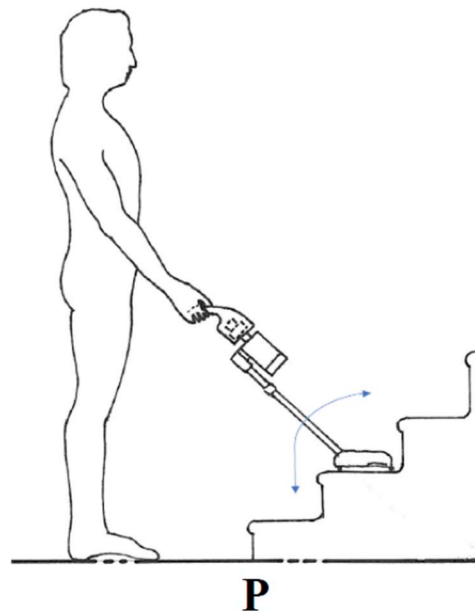


But Petitioners do not explain why the size of the vacuum relative to the size of the stairs is relevant to the analysis at hand, if at all. Indeed, as Mr. Davidshofer explained, the sketch is “not intended to be representative of physical size”—nor does it need to be as a demonstrative. Ex-1011, 112:2–5.

Petitioners also ignore the full context of Mr. Davidshofer’s testimony when they criticize Mr. Davidshofer’s alleged failure “to consider whether the individual’s arm could be straightened . . . should the user change their position” in diagram Q (above). Paper No. 30 at 24. During his deposition, Mr. Davidshofer testified that

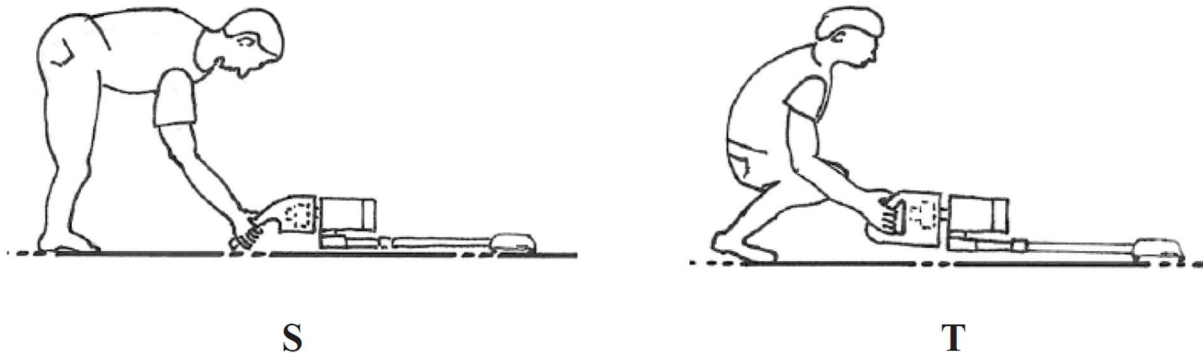
while the person's arm could be straight if the vacuum in diagram Q is lowered, "the wrist . . . would be manipulated as well," meaning that "[t]he wrist would have to rotate." Ex-1011, 112:6–16. It is further not an ergonomic or a preferable design if a user would have to constantly change positions in order to not bend their arm and/or wrist.

Additionally, Matsumoto's handle is more favorable not only because it helps the user's arm and wrist stay straight, but also because, as Mr. Davidshofer explained and Petitioners fail to rebut, "the user is able to counter the [downward] force more efficiently *where the handle is parallel to the surface* to be cleaned" as the Matsumoto handle is:



Ex-2017 at ¶136 (emphasis added).

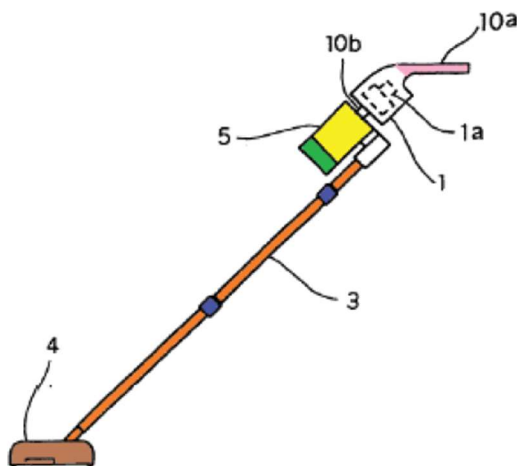
Finally, Petitioners have no response to Mr. Davidshofer’s opinion that “is not in a comfortable alignment for grasping by a user when picking up the vacuum cleaner below the user’s elbows. Ex-2017 at ¶144 (illustrations S&T below); *see also* Paper No. 20 at 66.



2. A Person of Skill in the Art Would Not Have Understood That Matsumoto Discloses Miniaturizing Its Vacuum Cleaner

Contrary to Petitioners’ argument, a person of skill in the art would not have understood that Matsumoto discloses miniaturizing its vacuum cleaner. Petitioners mischaracterize Mr. Davidshofer’s testimony in alleging that “physical friction-fit interfaces” and “physical bayonet mount interfaces” would nonetheless support the use of Matsumoto’s vacuum as a handheld. On the contrary, Mr. Davidshofer, when asked about the below figure, testified that: (1) if the blue portions are physical friction fit interfaces, he ***cannot*** “discern . . . from the image or the text” whether the physical friction fit interfaces would “enable the connection pipes to be detached from one another,” “whether they are permanent or not permanent,” or what the

intent of those physical friction fit interfaces was; and (2) if the blue portions are bayonet mounts, “[n]ot all bayonet mounts are removable” and that the figure “*does not show* one way or intimate one way or another on this.” Ex-1011, 97:3–98:7, 98:13–99:11 (emphasis added).¹ Thus, Mr. Davidshofer’s testimony confirms that a person of skill in the art would *not* be able to discern from the figure (and specifically the blue portions) that the orange portions are removable connection pipes, and that the Matsumoto vacuum can be miniaturized.



Pet., 65

Indeed, as Dyson pointed out, this is consistent with Mr. Fester’s testimony that “Matsumoto in the figure 25 . . . is disclosing there a handheld stick-type

¹ Petitioners also took Mr. Davidshofer’s testimony out of context when alleging that Mr. Davidshofer “determined that the claim ‘could possibly not be limited to a handheld vacuum,’” whereas Mr. Davidshofer specifically stated he “didn’t consider” this question. Paper No. 30at 25.

vacuum cleaner that's more for kind of cleaning floors. *Matsumoto does not explicitly disclose a miniature handheld vacuum to be used as a handheld configuration* that would be suited for cleaning other types of surfaces such as couches and bedding.” Paper No. 20 at 57, citing EX-2018, 163:7–14 (emphasis added). Petitioners have no response to this. Furthermore, as noted above, Petitioners fail to identify any prior art references showing issues with Matsumoto’s handle and instead rely on nothing more than Mr. Fester’s own alleged experience to allege that Matsumoto’s handle is “essentially a cantilever.” See Paper No. 30 at 21 n.4. However, the Matsumoto handle functions in context of a vacuum that operates in a way whereby the floor supports a substantial portion of the weight of the vacuum. See, e.g., EX-2017 at ¶ 132 (“Because *much of the weight* [in Matsumoto] *is distributed to the floor* and the handle is maintained at a comfortable height, . . . the design considerations for the handle placement and design are substantially different than for Conrad ’787 or Dyson.”) (emphasis added). Thus, the alleged issue of cantilevering only arises when a motivation to miniaturize exists—a motivation that Petitioners have failed to establish.

3. As to Ground 4, Petitioners Have Not Showed That the Combination Discloses Limitation 1d and Claim 2

As discussed above in Section II.B.2, Petitioners have not shown that Conrad ’630 motivated a combination with Dyson as proposed by Petitioners to arrive at the claimed invention.

III. SECONDARY CONSIDERATIONS SUPPORT A FINDING OF NONOBVIOUSNESS

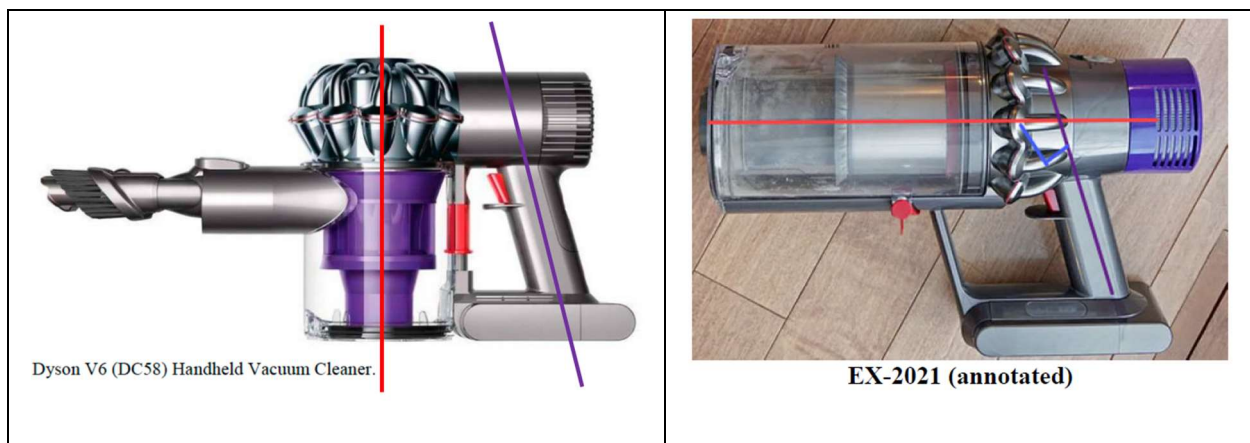
As an initial matter, Petitioners do not appear to contest that: (1) the Dyson V10 vacuum practices all of the limitations of the Challenged Claims including both the dustbin and the handle limitations, and (2) the point-and-shoot feature of the V10 satisfied a long-felt need and was praised. Instead, Petitioners mainly argue that the point-and-shot feature is only relevant to limitation 1c concerning the dustbin, but not to limitation 1d concerning the handle.

Not true. The point-and-shoot feature is clearly reflected in both the dustbin limitation and the handle limitation. Specifically, while limitation 1c specifies a dustbin comprising an end wall with a closed configuration for retaining the dirt and an open configuration for removing the dirt, such that the *dirt can be released directly* from the dustbin, limitation 1d specifies a handle inclined in a certain angle with respect to the dustbin, such that the dirt can be *released from the dustbin in an angle* that is more ergonomic and user-friendly. As the '687 Patent itself states: “A handheld vacuum cleaner in accordance with the invention can be emptied by *pointing* the cyclonic separating unit away from the user and *opening* the end portion while maintaining a natural grip on the handle.” '687 Patent at 1:52–55 (emphasis added).

Petitioners' criticism that “Mr. Davidshofer . . . merely states, without analysis, that the ‘point-and-shoot feature is accomplished through a combination of

two of the limitations” is thus unfounded. It is clear that both limitations contribute to the widely-praised point-and-shoot feature of the V10, where a user can simply *point* the dustbin at the trash can (limitation 1d) and *release* the dirt (limitation 1c); no intensive analysis is required.

Petitioners are also incorrect that “the handle configuration remained the same between the [older] Dyson V6 and [newer] V10 vacuums.” Paper No. 30 at 29. A simple comparison of the V6 and the V10 shows that the handle is inclined in a different angle and position with respect to the dustbin:



Ex-1003 at 5 (Dyson V6) (annotated), Paper No. 20 at 73 (Dyson V10).

Petitioners are also wrong in alleging that “the press articles that PO cites describe the point-and-shoot feature as relating solely to the dustbin, rather than the handle.” Paper No. 30 at 28. To the contrary, all of the praises that Petitioners quote in their reply *support* that the praise is directed to both the dustbin and the handle limitations. For example, it is because the handle is inclined with respect to the

dustbin in a certain angle so that “[t]he dustbin now empties *from the front, not the bottom* like the old model.” Paper No. 30 at 28 (citing Ex-2022 at 4). Similarly, it is because the handle is inclined in a certain angle so that when a user grasps the handle, “[i]n this new design, the bin faces forward” instead of “downward.” *Id.* (citing Ex-2023 at 3).

Therefore, secondary considerations, including at least industry praise and long-felt need, support a finding of nonobviousness.

IV. CONCLUSION

For the foregoing reasons and those set forth in Patent Owner’s Response (Paper No. 20), the Challenged Claims should be found not unpatentable.

Date: September 25, 2024

Respectfully submitted,

/s/ Christian Huehns

Christian Huehns (Reg. No. 77,717)

christian.huehns@kirkland.com

Jay Emerick (*pro hac vice*)

jay.emerick@kirkland.com

KIRKLAND & ELLIS LLP

333 West Wolf Point Plaza

Chicago, IL 60654

Telephone: (312) 862-2000

Facsimile: (312) 862-2200

Matthew Benjamin Hershkowitz

(Reg. No. 77,881)

matt.hershkowitz@kirkland.com

KIRKLAND & ELLIS LLP

601 Lexington Ave

New York, NY 10022

Telephone: (212) 446-4800

Facsimile: (212) 446-4900

Attorneys for Patent Owner

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a complete copy of the foregoing document was served on September 25, 2024 on counsel of record for the Petitioners via email to the following address: GDC-SharkNinjaIPRD@gibsondunn.com.

/s/ Christian Huehns

Christian Huehns (Reg. No. 77,717)