

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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DYSON TECHNOLOGY LIMITED AND DYSON, INC.,  
Petitioners,

v.

OMACHRON INTELLECTUAL PROPERTY INC.,  
Patent Owner.

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Case No. IPR2024-01351  
U.S. Patent No. 7,776,120

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**PATENT OWNER'S PRELIMINARY RESPONSE**

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**PATENT OWNER'S EXHIBIT LIST**

| <b>Exhibit</b> | <b>Description</b>              |
|----------------|---------------------------------|
| 2001           | Declaration of Dr. Glenn Vallee |
| 2002           | CV of Dr. Glenn Vallee          |

**TABLE OF ABBREVIATIONS**

| <b>Abbreviation</b> | <b>Term</b>                                                     |
|---------------------|-----------------------------------------------------------------|
| '120 Patent         | U.S. Patent No. 7,776,120 (Ex1001)                              |
| Davis               | U.S. Patent No. 2,542,635 (Ex1010)                              |
| Jeong               | U.S. Patent No. 7,442,219 (Ex1006)                              |
| Jung                | U.S. Patent No. 7,669,282 (Ex1005)                              |
| Min                 | U.S. Patent App. Pub. No. 2005/0198771 (Ex1011)                 |
| Soler               | U.S. Patent No. 5,267,371 (Ex1009)                              |
| Challenged Claims   | Claims 1–20 of U.S. Patent No. 7,776,120                        |
| Fig.                | Figure                                                          |
| IPR                 | <i>inter partes</i> review                                      |
| Patent Owner        | Omachron Intellectual Property Inc.                             |
| Petitioners         | Dyson Technology Limited and Dyson, Inc.                        |
| Pet.                | Petition For <i>Inter Partes</i> Review, Case No. IPR2024-01351 |
| POSITA or POSA      | person[s] of ordinary skill in the art                          |

## 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 1–20 of U.S. Patent No. 7,776,120.

The '120 Patent has four independent claims (Claims 1, 9, 16, and 18). The Petition asserts nine grounds against the Challenged Claims.

| Ground | Challenge    | Reference(s)    | Claims                      |
|--------|--------------|-----------------|-----------------------------|
| 1      | Anticipation | Jung            | 1, 3–5, 7, 9–12, 14–19      |
| 2      | Anticipation | Min             | 1, 3–5, 7, 9–12, 14–19      |
| 3      | Obviousness  | Jung            | 1, 3–7, 9–12, 14–19         |
| 4      | Obviousness  | Min             | 1, 3–7, 9–12, 14–19         |
| 5      | Obviousness  | Jung with Jeong | 8, 20                       |
| 6      | Obviousness  | Min with Jeong  | 8, 20                       |
| 7      | Obviousness  | Jung with Davis | 2, 13                       |
| 8      | Obviousness  | Min with Davis  | 2, 13                       |
| 9      | Anticipation | Soler           | 1, 3–5, 9, 12, 14–15, 18–19 |

None of the asserted grounds present a reasonable likelihood of success in invalidating any claim of the '120 Patent, because each fails to disclose every element of the independent claims. Each of the nine grounds relies on one of three

primary references—Jung, Min or Soler—to meet the elements of the independent claims of the patent. Jung and Min are alleged to meet all four independent claims (1, 9, 16, and 18), while Soler is alleged to meet all independent claims except claim 16 (*i.e.*, claims 1, 9, and 18). Yet each of Petitioners' grounds fail because the primary reference fails to disclose key elements of the independent claims.

Central to the invention claimed in the '120 Patent is a cyclone separator for a vacuum cleaner that has a plate that substantially divides the cyclone separator into a cyclone chamber and a dirt collection chamber, such that the cyclonic airflow carries dirt to the dirt collection chamber, but the plate inhibits the dirt from returning to the cyclone chamber. Additionally, inventor Wayne Conrad taught, and claimed, that the plate is moveable out of position so that the user can empty the cyclone chamber and dirt collection chamber at the same time through one end of the cyclone separator. The invention thus provides a separation plate defining the cyclone chamber and dirt collection chamber while the vacuum cleaner is in use but that is movable for emptying.

None of the three primary references disclose all of the above elements, which are required for each independent claim. For example, Jung teaches a cyclone separator where the user separates the cyclone chamber from the dirt collection chamber at the point where the two chambers meet to empty the unit. Rather than

moving the plate in a way that allows for the emptying of the two chambers, Jung's plate remains with the dirt collection chamber.

Min does not disclose a dirt collection chamber as claimed. Min does not teach a dirt collection chamber that is part of a cyclone separator, where cyclonic airflow carries dirt from a cyclone chamber to a dirt collection chamber. Instead, as described by Min, dirt in the embodiment relied in the Petition falls by gravity to the lower parts of its upper and lower inner space.

Finally, Soler describes a vacuum that has two cyclone separator units. Neither cyclone separator has a plate dividing a cyclone chamber from a dirt collection chamber—instead, each has simply an open volume. In order to assert Soler's embodiment against the claims of the '120 Patent, Petitioners and their expert point to an alleged cyclone chamber from the first cyclone separator and an alleged dirt collection chamber from the second cyclone separator, and claim that the wall separating them is a plate. This convoluted application of the claim language bears no resemblance to the teachings and claims of the '120 Patent, which concern a plate that substantially divides a cyclone chamber from its dirt collection chamber, allowing dirt to be carried from the cyclone chamber to the dirt collection chamber. In short, Petitioners' ground based on Soler relies on a cyclone chamber and dirt collection chamber that are unrelated.

The Petition also alleges obviousness grounds for Jung alone (Ground 3), Jung in combination with Jeong (Ground 5), and Jung in combination with Davis (Ground 7). But nowhere in any of those obviousness grounds do Petitioners offer any additional arguments or evidence for meeting the elements of the ***independent claims***; rather, the secondary references are directed to elements of dependent claims. Likewise, the Petition alleges obviousness grounds for Min alone (Ground 4), Min in combination with Jeong (Ground 6), and Min in combination with Davis (Ground 8). And like Jung, none of the secondary references that are combined with Min are offered as evidence for meeting the elements of the independent claims.

Accordingly, the obviousness grounds, like the anticipation grounds, rise and fall on the sufficiency of Jung, Min and Soler to meet the independent claims. Because each ground fails to identify a disclosure with every element of any independent claim, none of the grounds disclose all elements for any claim, including the dependent claims. For at least these reasons and those set forth below and as explained by Dr. Glenn Vallee (Ex2001), Petitioners fail to show a reasonable likelihood of success on any Challenged Claim, and the Board should deny institution of IPR.

## **II. CLAIM CONSTRUCTION**

Petitioners wrote that they “do not believe any claim construction is necessary to resolve the parties’ controversy in this Petition, and the claims should be given

their plain and ordinary meaning for purposes of this IPR.” Pet., 21–22. In the currently pending investigation at the ITC (“In the Matter of CERTAIN SURFACE CLEANING DEVICES AND COMPONENTS THEREOF, Inv. No. 337-TA-1404”), the Petitioners, with a related party, asked for construction of the following two claim terms of the ’120 Patent:

| <b>Term</b>                                                                                                    | <b>Respondents’ Construction</b>                                                                        | <b>Complainants’ Construction</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| “plate”                                                                                                        | Excludes a “plateau”                                                                                    | No construction necessary. This term should be understood according to its plain and ordinary meaning in the context in which it is used in claims 1, 2, 4, 5, 9, 12, 13, 15, 18, and 19 of the 120 Patent (e.g., “a plate having a cyclone chamber surface and positioned between a cyclone chamber and a dirt collection chamber,” “the plate being moveable between an in use position and an emptying position,” “a plate positioned at the openable end”), e.g., as a structural element which is characterized by a three-dimensional solid whose thickness is very small when compared with other dimensions. |
| “the plate being moveable between an in use position and an emptying position when the openable end is opened” | “opening the openable end causes the plate to move between an in-use position and an emptying position” | No construction necessary. This clause, including the terms used within, should be understood according to its plain and ordinary meaning in the context in which it is used in claim 1 of the Patent, meaning, e.g., that the plate can be moved to different positions relative to the other components of the claimed apparatus, namely an in use position and an emptying position, when the openable end is opened.                                                                                                                                                                                             |

The ITC has not yet resolved that dispute. The analysis presented in this POPR applies the plain and ordinary meanings of the claim terms, in accordance with the approach taken by the Complainants.

The constructions proposed by Respondents (*i.e.*, Petitioners) in the ITC investigation are narrower than the plain and ordinary meanings, and Petitioners did not argue in their Petition here that the prior art provides disclosures meeting those narrower constructions.

### **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**

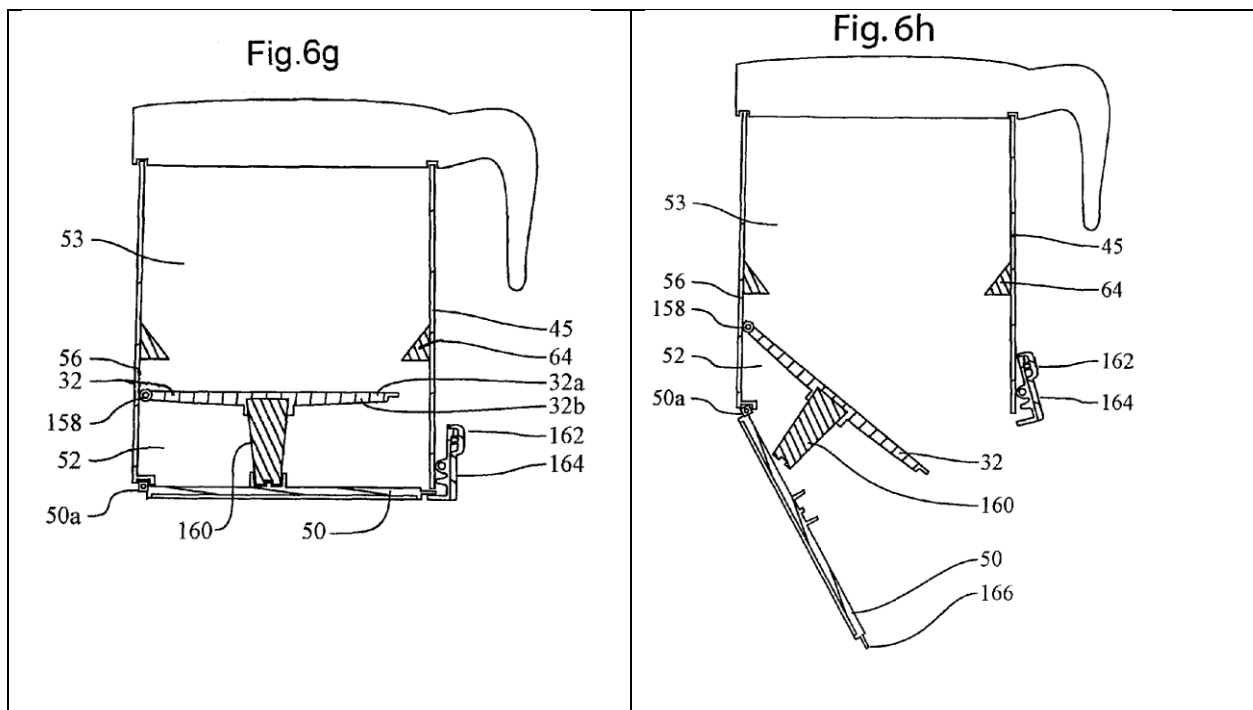
#### **A. Summary of the '120 Patent**

##### **1. Overview and Prosecution History**

U.S. Patent No. 7,776,120, entitled "Vacuum Cleaner with a Moveable Divider Plate" and naming Wayne Ernest Conrad as inventor, was issued by the USPTO on August 17, 2010. The '120 Patent is assigned to Omachron Intellectual Property Inc.

The '120 Patent claims a surface cleaning apparatus including, among other things, a dirt inlet, a handle, a fluid flow motor, and a cyclone separating unit. The

cyclone separating unit of the surface cleaning apparatus of the '120 Patent includes a cyclone chamber and a dirt collection chamber, with a moveable plate positioned between the two chambers. The plate is movable between an "in use" position (see, e.g., Fig. 6g below) and an "emptying" position (see, e.g., Fig. 6h below), such that when it is in the emptying position it permits dirt in the cyclone chamber and the dirt collection chamber to be removed concurrently.



## B. Prosecution History of the '120 Patent

For over three years, the United States Patent and Trademark Office examined the application that issued as the '120 Patent. The '120 Patent issued from U.S. Patent Application No. 11/683,670, filed on March 8, 2007, which claims priority to U.S. Provisional Application No. 60/780,824, filed on March 10, 2006. See Ex1001.

On November 10, 2009, the Examiner issued a non-final rejection (after withdrawing a prior rejection), in which claims were rejected partly for anticipation by and obviousness over U.S. Patent Publication No. US 2002/0178698 (“Oh”), finding that Oh discloses the same surface cleaning apparatus with the claimed structure. Ex1004, 186-192.

On February 10, 2010, the Applicant amended the claims as follows:

1. (Currently amended) A surface cleaning apparatus comprising:
  - (a) a dirt inlet;
  - (b) a handle;
  - (c) a cyclone separator having an outer wall, a fluid inlet downstream from the dirt air inlet and a fluid outlet;
  - (d) a plate having a cyclone chamber surface and positioned between to ~~substantially divide the cyclone separator into a cyclone chamber and a dirt collection chamber, the dirt collection chamber having an openable end, the plate being removably mounted in the cyclone separator, moveable to an emptying position when the openable end is opened;~~
  - (e) ~~a passage extending between the cyclone chamber and the dirt collection chamber; and,~~
  - (f) a fluid flow motor.

Ex1004, 196-206.

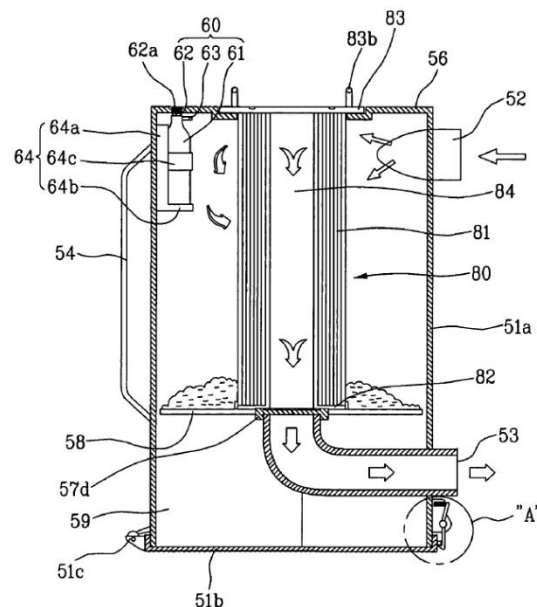
According to the Applicant, these amendments “specify that . . . [t]he plate is moveable to an emptying position when the openable end of the dirt collection chamber is opened,” as distinct from the Oh reference’s disclosure of a “shielding member 13 . . . affixed by a screw to the grill body,” and arguing that “the Examiner has not pointed to any passage in Oh et al. wherein it is stated why a user would remove shielding member 130.” 2/10/2010 Applicant Remarks at 7.

On April 21, 2010, following a telephone interview, the Examiner amended the claims, which later issued as the Asserted Claims on August 17, 2010. Ex1004, 214.

## **C. Overview of Asserted References**

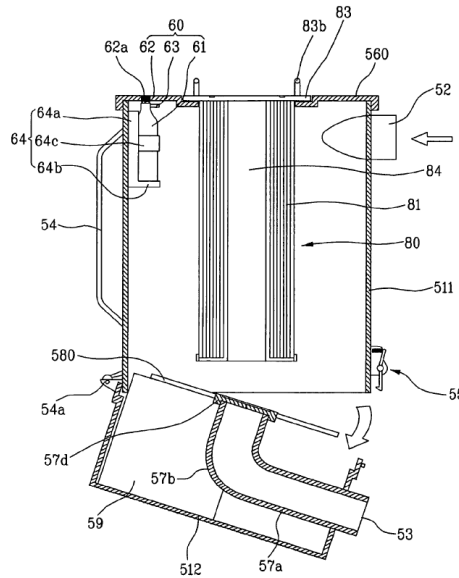
### **1. Jung**

Jung (Ex1005) is a U.S. Patent that issued as number 7,669,282. It was filed on December 8, 2004, and assigned to LG Electronics Inc. Jung discloses dust collecting assemblies that are removably present in upright or canister vacuum cleaners. Jung describes a dust collecting assembly that is divided into an upper inner space and a lower inner space by a fixed separation plate (element 58 in the below), and describes dust collecting in both the upper and lower inner space:



Ex1005 at Fig 6. Jung shows multiple ways of opening the dust collecting assembly – through a detachable top plate on the assembly, a detachable or openable bottom

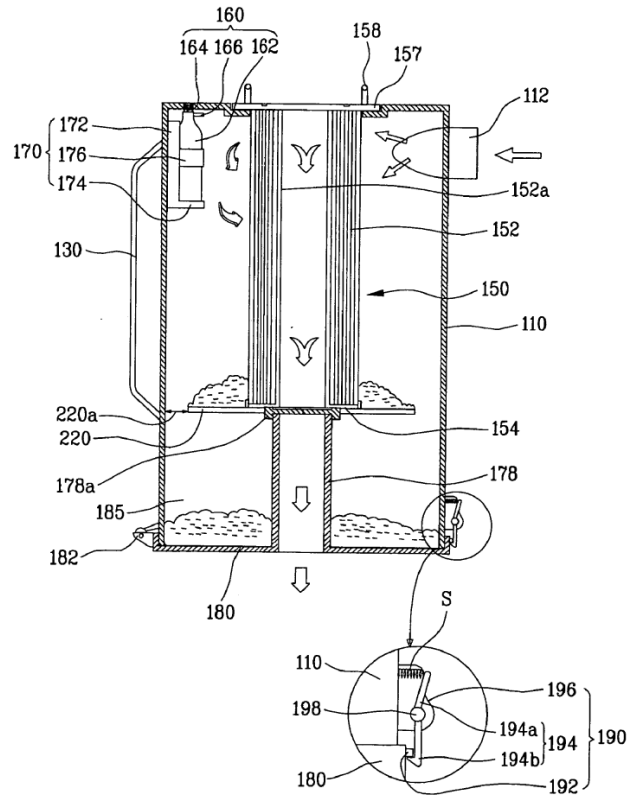
plate on the assembly (i.e. element 51b above), or by separating the assembly at the interface of the upper and lower inner space (shown below):



Ex1005 at Fig. 11.

## **2. Min**

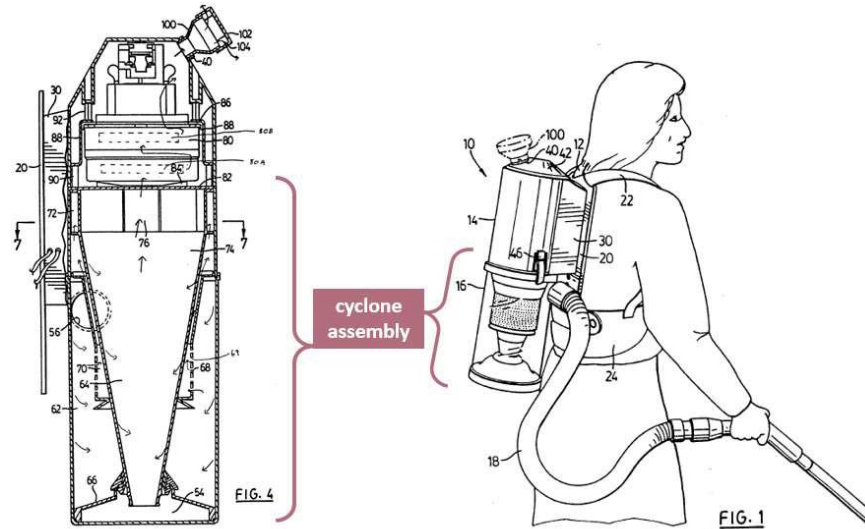
Min (Ex1011) is a U.S. Patent Application that was published as Pub. No. 2005/0198771. As with Jung, it was filed on December 8, 2004, and assigned to LG Electronics Inc. Min never issued as a patent but was abandoned. Like Jung, Min discloses a dust collecting assemblies that are removably present in upright or canister vacuum cleaners. Like Jung, Min describes a dust collecting assembly that is divided into an upper inner space and a lower inner space. Dust is shown and described as settling by gravity in both the upper and lower inner space:



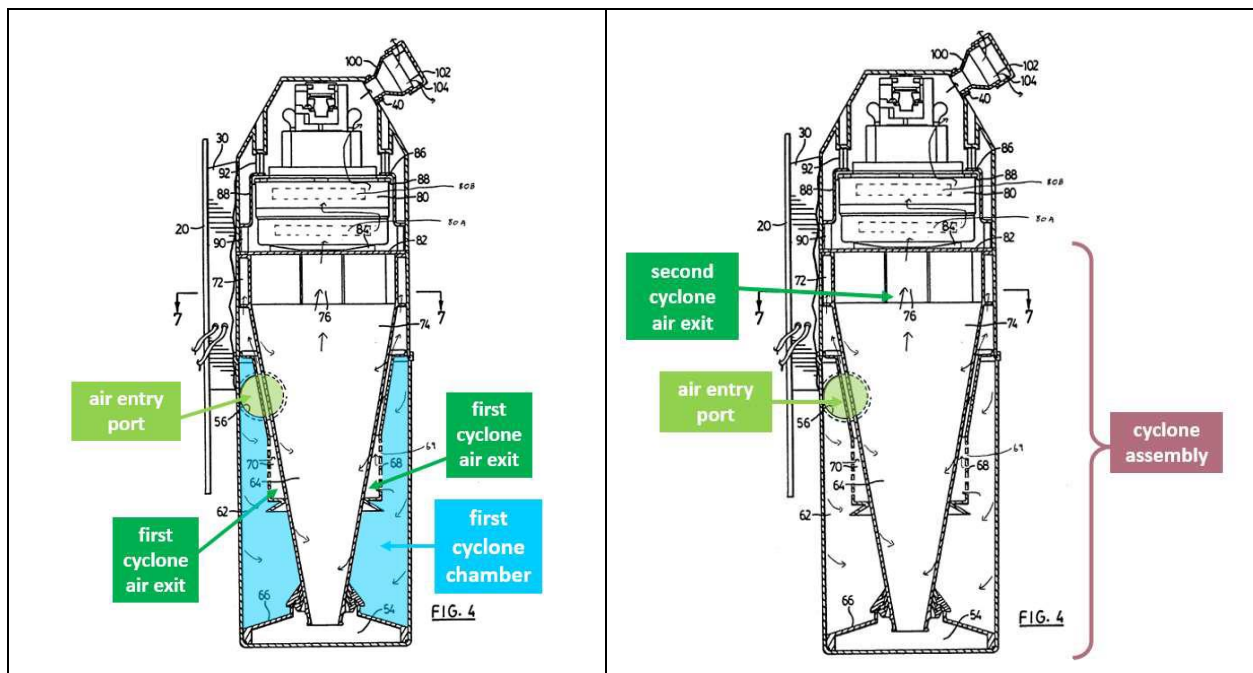
Ex1011 at Fig 9; ¶ 71. While Min shares some figures with Jung, other figures are different, and the specification description is not the same.

### 3. Soler

Soler (Ex1009) is U.S. Patent No. 5,267,371, issued on December 7, 1993. It discloses a backpack-style vacuum system that has a dual cyclone system, with two cyclone separators.



Ex1002 ¶ 323 (annotating Ex1009, Fig. 1). Petitioner's expert Dr. Giachetti has annotated the figures from Soler to show the two cyclone separators:



Ex1002 ¶ 326, 328 (annotating Ex1009, Fig 4). Soler describes its two cyclones as removing different types of dirt from the intake air:

The first or outer cyclone is designed to remove the larger and heavier dirt particles which are entrained in the intake air and the second or inner cyclone is used to remove the finer and lighter particles which are entrained in the exhaust air from the first cyclone.

Ex1009 at 2:30–35. Soler also discloses single cyclone embodiments (Ex1009 at 3:2-17 (“at least one cyclone”). However, the Petition only relies on embodiments with two cyclones in series.

## **V. SPECIFIC GROUNDS OF UNPATENTABILITY**

### **A. Petitioners Failed to Show that Jung Discloses Every Element of Any Independent Claim**

Petitioners have not shown that Jung discloses every element of any of the four independent claims, as explained below. Accordingly, Ground 1 does not show anticipation of any claim.

#### **1. Jung does not have an openable end**

Jung does not anticipate the Challenged Claims of the '120 Patent, for at least the reason that it does not have an openable end as required by each Challenged Claim.

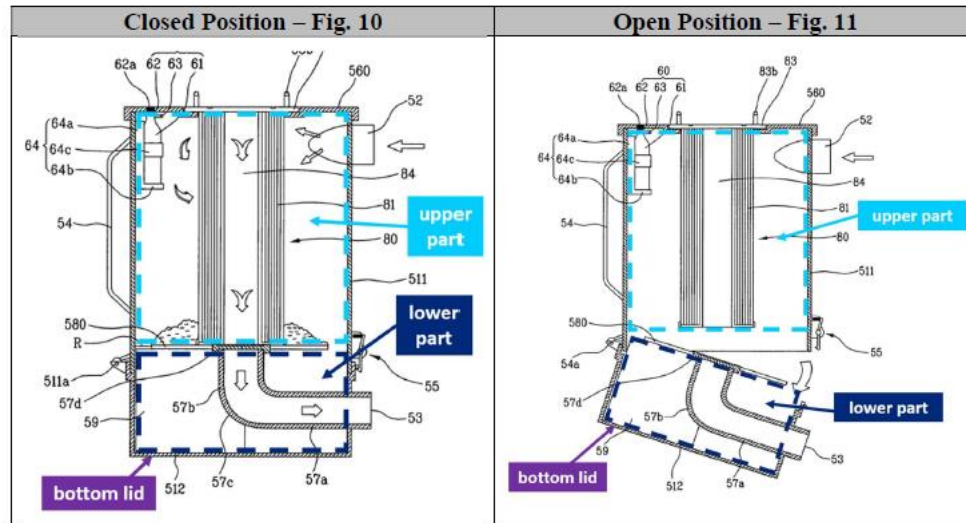
Claim 1 of the '120 Patent requires, among other things, “a plate having a cyclone chamber surface and positioned between a cyclone chamber and a dirt collection chamber, the dirt collection chamber having an openable end.” Each claim that depends from claim 1 thus require this same element.

Claim 9 of the '120 Patent requires, among other things, “a cyclone separator comprising a cyclone chamber and a dirt collection chamber, the cyclone separator having a fluid inlet downstream from the dirt air inlet, an openable end and a fluid outlet.” Each claim that depends from claim 9 thus require this same element.

Claim 16 of the '120 Patent requires, among other things, “the cyclone separator having a fluid inlet downstream from the dirt air inlet, an openable end and a fluid outlet.” Each claim that depends from claim 16 thus require this same element.

Claim 18 of the '120 Patent requires, among other things, “a cyclonic unit comprising a cyclone chamber and a dirt collection chamber and having an openable end.” Each claim that depends from claim 18 thus require this same element.

The Petition asserts that the embodiment of Jung that is shown in Figures 10 and 11 anticipates the Challenged Claims. Petitioners and Dr. Giachetti assert that the upper part of dust collection assembly is the claimed cyclone chamber, the lower part of the dust collection assembly is the claimed dirt collection chamber, and that element 58 is the plate positioned between them:



Ex1002 ¶ 104.

As can be seen when comparing Figure 10 with Figure 11 above, there is a hinged connection in the middle of the dust collection assembly that allows the upper part to pivot away from the lower part of the assembly. Or, according to the Petition's use of the claim terms, it allows the cyclone chamber to pivot away from the dirt collection chamber.

With regard to Claim 1’s requirement that the dirt collection chamber has an openable end, the Petition points to the lower part as the openable end. Pet., 28–30; Ex1002 ¶ 105 (“the lower part/bottom lid of the dust collecting assembly, which individually and collectively are an openable end.”). This interpretation is not how a POSITA would understand the Jung embodiment. Petitioners and Dr. Giachetti assert that a POSITA would understand the “lower part” to be a dirt collection chamber (Ex1002 ¶ 96), and also asserts that a POSITA would understand the “lower

part/bottom lid” to be the openable end of the dirt collection chamber. Pet., 28–30; Ex1002 ¶ 105. This interpretation makes no sense—the dirt collection chamber cannot be the openable end of itself. And the interpretation is at odds with the figures. The Jung embodiment shows the whole “lower part/bottom lid” moving. There is no end of the alleged dirt collection chamber (no top, bottom or side) that is openable.

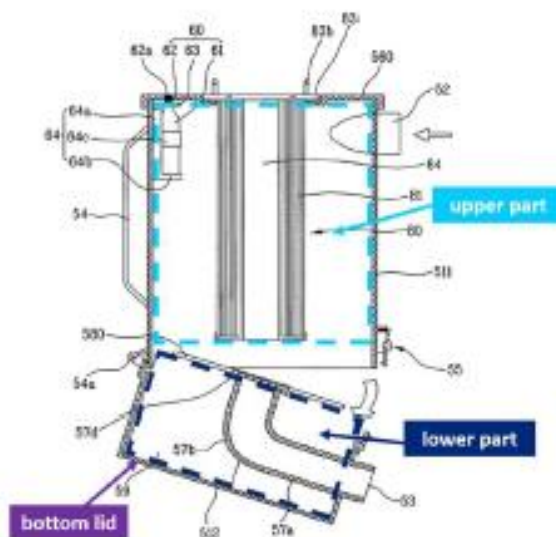
Petitioners assert that the bottom lid is the same element as the lower part, which they claim is a dirt collection chamber. Pet., 25; Ex1002 ¶ 96. To the extent that they are distinguishing the bottom lid as the wall at element 512 from the lower part as a whole, that interpretation does not meet the claims either. The wall at element 512 is not openable, and so is not an openable end of the dirt collection chamber or cyclone separator. See Ex2001 ¶ 41.

With regard to the requirement of claims 9, 16, and 18 that the cyclone separator or cyclonic unit has an “openable end,” Petitioners point to the lower part as an openable end. Pet., 28–29; Ex1002 ¶ 102 (“Jung discloses that its dust collecting assembly has a “bottom lid 512 for opening and closing the bottom of the top container 511.”). Here Petitioners and their expert have misinterpreted the claim language. Claims 9 and 16 requires that the ***cyclone separator*** has an openable end, not that the ***cyclone chamber*** has an openable end. Likewise, claim 18 requires that the ***cyclonic unit*** has an openable end. As stated in the Jung quote that Petitioners and Dr. Giachetti include, the bottom lid (even if it could be consider an “end”) is

“for opening and closing the bottom of *the top container*.” Pet., 28; Ex1002 ¶ 102.

Petitioners and Dr. Giachetti clearly indicate that the “top container corresponds to the upper part,” which they identified as the cyclone chamber. Pet., 27–29; Ex1002 ¶ 103. Thus, in Jung, it is the accused cyclone chamber, not the entire cyclone separator, that has an openable “end.” See Ex2001 ¶ 42.

The images in Jung are consistent with that description in the Jung specification, and are not consistent with Petitioners' position. See Ex2001 ¶ 43. The pivot point shown in Figure 11 allows the lower part to pivot away from the upper part, separating the cyclone chamber from the dirt collection chamber (according to Petitioners' identification of those elements):



Pet., 30 (annotating Fig. 11 of Ex1005). This is an alternate approach to having an end (a top, bottom or even side surface or wall) that opens. The interior of alleged cyclone separator in Jung is accessed by separating the two components (the upper

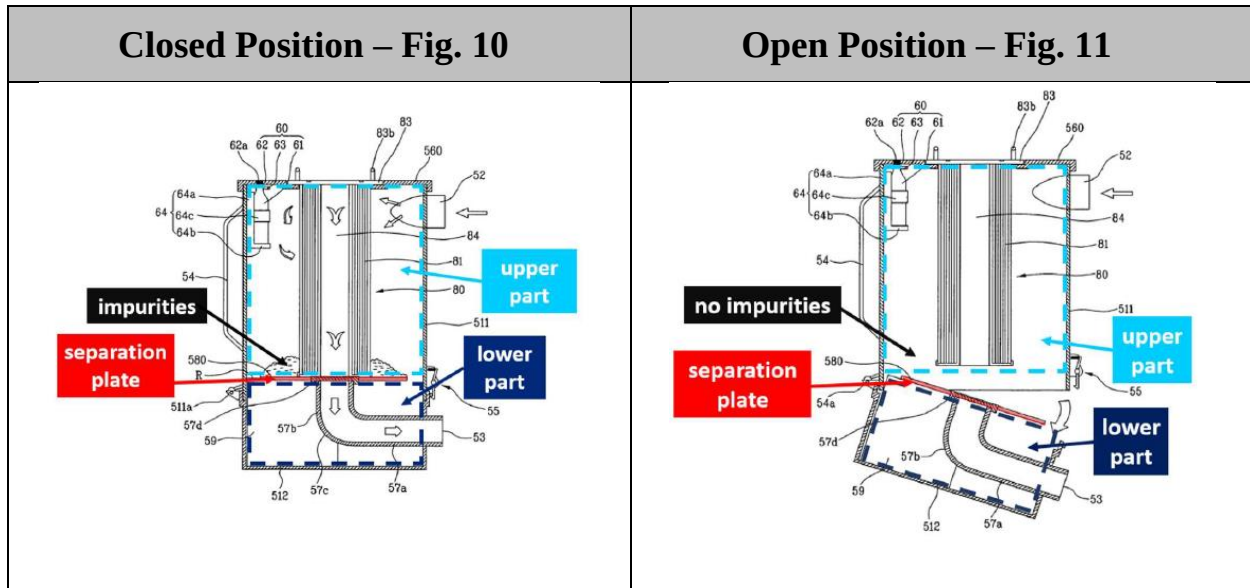
and lower parts), not by opening an end. Indeed, later in the Petition, Petitioners admit that “Jung teaches opening at and below the interface between the dirt collection chamber and cyclone chamber.” Pet., 32.

**2. Jung's separation plate does not move to permit dirt in the cyclone chamber and the dirt collection chamber to be removed concurrently**

Independent claims 1, 9 and 18 each require that the plate is moveable to a position to permit dirt in the cyclone chamber and the dirt collection chamber to be removed concurrently:

- a. Claim 1: the plate being moveable between an in use position and an emptying position when the openable end is opened wherein, in the emptying position, the plate is in a position to permit dirt in the cyclone chamber and the dirt collection chamber to be removed concurrently;
- b. Claim 9: the plate is moveably mounted between an in use position and an emptying position wherein the plate is in a position to permit dirt in the cyclone chamber and the dirt collection chamber to be removed concurrently;
- c. Claim 18: the plate is moveably mounted between an in use position and an emptying position wherein, in the emptying position, the plate is in a position to permit dirt in the cyclone chamber and the dirt collection chamber to be removed concurrently.

This element is not present in Jung's embodiments. According to Petitioners and their expert, Jung discloses that the plate is moveable when the lower part is pivoted away from the upper part:



Pet., 33–34 (Fig. 10 and 11 from Ex1005 with annotations); Ex1002 ¶ 117. According to the Petition, the images above show that “[w]hen the separation plate rotates into the open (i.e., ‘emptying’) position, the impurities collected in the upper part are discharged.” Pet., 33; Ex1002 ¶ 117. While that may be true for the **upper part**, which Petitioners correlate to the cyclone chamber, the plate has not moved into an emptying position relative to the **lower part**, which Petitioners correlate to the dirt collection chamber. See, e.g., Pet., 31 (“Jung’s separation plate is positioned between the ‘cyclone chamber’ (i.e., the upper part) and the ‘dirt collection chamber’ (i.e., the lower part)”); Ex2001 ¶ 45.

The plate, however, does not move relative to the lower part at all – it is covering the same portion of the “lower part” in both images above. Thus, as understood by a POSITA, in the Jung embodiment the plate has not moved to a position to permit dirt to be removed from the dirt collection chamber concurrently

with the cyclone chamber, as required by Claims 1, 9 and 18. Because the plate has not moved relative to the lower part (Petitioners' "dirt collection chamber"), the only way to empty any dirt from the lower part is to turn that dirt collection chamber upside down and shaking the unit, such that dirt might shake out through the dirt inlet opening. Ex2001 ¶ 45. Jung's cyclone separator therefore does not provide one of the benefits of the invention in the '120 Patent, where the user can open the openable end, moving the plate and allowing for dirt to be removed concurrently from the cyclone chamber and dirt collection chamber.

### **3. Petitioners' Obviousness Grounds Based on Jung Fail for the Same Reasons**

For the reasons above regarding Ground 1, Jung does not disclose every element of any independent claim of the '120 Patent.

The Petition offers three obviousness ground based on Jung:

- Obviousness on Jung alone (Ground 3),
- Obviousness in combination with Jeong (Ground 5),
- Obviousness in combination with Davis (Ground 7).

Petitioners do not use those obviousness grounds to provide any additional evidence to address the shortcomings of Jung in disclosing the elements of any of the four independent grounds. In other words, nowhere in any of those obviousness grounds do Petitioners offer any additional arguments or evidence for meeting *the elements of the independent claims*. Instead, all the arguments in those grounds are

directed to elements of specific dependent claims. The Petition relies entirely on Ground 1 in order to meet the elements of the independent claims. Pet., 67–73; Ex2001 ¶¶ 55–56, 59–60, 63–64.

With regard to Ground 3 (Jung alone), neither the Petitioners nor Dr. Giachetti identifies any claim element for any independent claim that would be supplied by another reference or piece of knowledge in combination with Jung. Pet., 67; Ex1002 ¶¶ 238–239. The Petition suggests that a POSITA could mix variations from different embodiments based on boiler plate language in Jung, but does not identify any such embodiments, nor any variations, and does not suggest any combination. Pet., 67. Thus, Ground 3 does not offer any additional evidence concerning the independent claims, and fails to render each independent claim, and the claims that depend from those independent claims, obvious for the reasons discussed above for Ground 1. Ex2001 ¶¶ 55–56.

Ground 3 does discuss dependent Claim 6. Pet., 68–72. However, because Petitioners have not shown that Jung discloses every element of Claim 1, Jung cannot render obvious Claim 6, which depends from Claim 1.<sup>1</sup>

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<sup>1</sup> Patent Owner does not concede that Petitioners have shown that the elements of Claim 6 are present in the asserted prior art, or that there is a motivation to combine the various embodiments and references discussed.

With regard to Ground 5, the Petitioners and Dr. Giachetti assert that the Jung in combination with Jeong render obvious claims 8 and 20. Claims 8 and 20 are dependent claims (from claims 1 and 18, respectively) that add the additional elements of a plurality of cyclones in parallel and divider plates. The Petition does not suggest that Jeong teaches any element of claim 1 or 18. Pet., 75–83. Jung in combination with Jeong does not render obvious claims 8 and 20 because Jung does not disclose the elements of claims 1 and 18, as explained above for Ground 1. *See* Ex2001 ¶¶ 59–60.<sup>2</sup>

With regard to Ground 7, the Petitioners and Dr. Giachetti assert that the Jung in combination with Davis render obvious claims 2 and 13. Claims 2 and 13 are dependent claims (from claim 1 and 9, respectively) that add additional elements concerning a flow director flow director having a flow directing surface that extends inwardly and downwardly into the cyclone chamber from the outer wall of the cyclone chamber to a position above the plate. The Petition does not suggest that Davis teaches any element of claim 1 or 9. Pet., 85–89. Jung in combination with Davis does not render obvious claims 2 and 13 because Jung does not disclose the

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<sup>2</sup> Patent Owner does not concede that Petitioners have shown that the elements of claims 8 or 20 are present in Jeong, or that there is a motivation to combine the various embodiments and references discussed.

elements of claims 1 and 9, as explained above for Ground 1. See Ex2001 ¶¶ 63–64.<sup>3</sup>

**B. Petitioners Failed to Show that Min Discloses Every Element of Any Independent Claim**

Petitioners have not shown that Min discloses every element of any of the four independent claims, as explained below. Accordingly, Ground 2 does not show anticipation of any claim.

**1. Min does not disclose the claimed cyclone separator and dirt collection chamber**

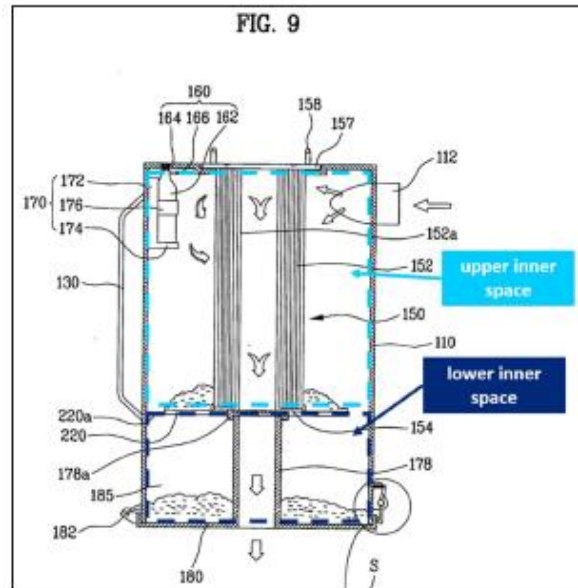
Min does not anticipate the Challenged Claims of the '120 Patent, as it does not disclose a cyclone separator with a cyclone chamber and dirt collection chamber, as required by all independent claims.

Min's upper inner space and lower inner space do not correspond to the cyclone chamber and direct collection chamber as claimed in the '120 Patent. The Petitioners and Dr. Giachetti assert that a POSITA would understand Min's dust collector assembly to be a cyclone separator comprising a cyclone chamber and a dirt collection chamber. Pet., 49–50, 54–55; Ex1002 ¶ 181. Petitioners assert that a

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<sup>3</sup> Patent Owner does not concede that Petitioners have shown that the elements of claims 2 or 13 are present in Davis, or that there is a motivation to combine the various embodiments and references discussed.

POSITA would understand Min's upper inner space to be "a cyclone chamber" and Min's lower inner space to be "a dirt collection chamber."



Pet., 49–50 (annotating Fig. 9 of Ex1011); Ex1002 ¶¶ 181–182.

Petitioners quote Min as saying that its dust collector assembly filters impurities “by using a cyclone using centrifugal force.” Pet., 49–50, citing Ex1011 ¶ 59. But this is a truncated quote from Min. The sentence at issue actually states that “[t]he dust collector assembly 100 filters impurities by using a cyclone using centrifugal force, or a separate filter.” Ex1011 ¶ 59. While Min discloses that a cyclone *may* be used, Figure 9, on which Petitioners and Dr. Giachetti rely, does not show a cyclone. The air entering through inlet 112 is not shown as being directed downward in order to start cyclonic flow, but rather is shown free flowing up and down. The air then flows through the filter 152, into the central channel and out of

the dust collector assembly. The curved arrows shown in this figure, to the left of the filter, show the dirt that falls to the bottom of the assembly after the air is filtered, as described by Min: “In more detail, the impurities with relatively large masses drawn into the dust collector 110 drop down toward the lower inner space of the dust collector 110 by gravity.” Ex1011 ¶ 71; see Ex2001 ¶¶ 48–49.

Regardless of whether a POSITA would choose to use “a cyclone using centrifugal force, or a separate filter” in Min’s upper space, thus making it a “cyclone chamber,” the lower inner space is not a dust collection chamber that is part of a cyclone separator. Ex2001 ¶ 50. Nor is lower inner space a dust collection chamber with a plate positioned between it and a cyclone chamber as required by each independent claim of the ’120 Patent. In contrast to Min, the ’120 Patent teaches and claims that both the cyclone chamber and the dust collection chamber is part of the cyclone separator, separated only by a plate that allows the dirt to be conveyed by cyclonic action from the cyclone chamber. See, e.g., Ex1001 at 1:51-55 (“The plate, in conjunction with the structure of the cyclone separator, produces **a passage that connects the cyclone chamber and the dirt collection chamber in communication** such that dirt that enters the cyclone chamber is **conveyed** to the dirt collection chamber.” (emphasis added)); see Ex2001 ¶ 50.

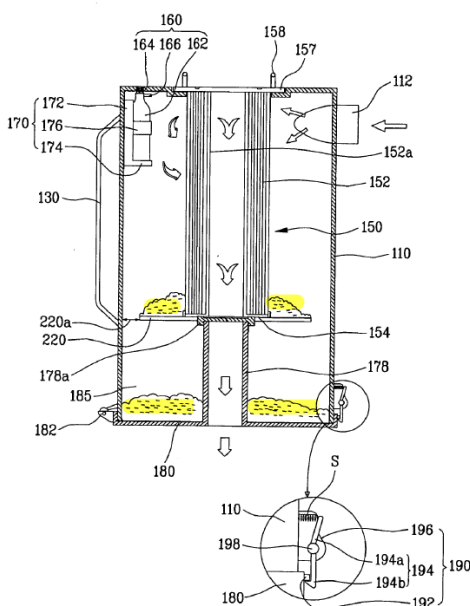
In the Min embodiment, however, the dust that collects in the dust collection chamber is there as a result of gravity, not as a result of cyclonic flow. Ex1011 ¶ 79.

There is no evidence in Min, whether in the text of the specification or in Figure 9, that there is any cyclonic flow down into and within the lower inner space. On the contrary, the shape of inlet 112, and the accompanying air flow arrows, indicates to a POSITA that the air flow is not directed in a cyclonic manner around and down the upper inner space toward the lower inner space. Ex2001 ¶ 51.

As such, a POSITA would understand Min does not disclose a dust collection chamber with cyclonic flow into it, and would conclude that the lower inner space is not a dirt collection chamber as required by each independent claim of the '120 Patent. Ex2001 ¶ 51.

The locations of the dirt shown in Figure 9 are further evidence of the above. Figure 9 shows substantial dirt collecting on top of the plate 220 as well as bottom wall 180.

FIG. 9



Ex1011, Fig. 9 (highlighted). A POSITA would recognize the dust shown in that figure as demonstrating what Min described in paragraph 59, that the dust is falling by gravity and gathering at the bottom of the upper inner space as well as the lower inner space. By contrast, in the claimed cyclone separator, the vast majority of the dirt would flow into the dirt collection chamber, and only fine particles would remain in the cyclone chamber, trapped in the filter. Ex2001 ¶ 53.

Because Min does not disclose the claimed cyclone separator or the claimed dirt collection chamber, it does not anticipate any of claims 1, 9, 16 or 18. Because Min does not anticipate any independent claim of the '120 Patent, it does not anticipate any dependent claim.

## **2. Petitioner's Obviousness Grounds Based on Min Fail for the Same Reasons**

For the reasons above regarding Ground 2, Min does not disclose every element of any independent claim of the 120 Patent.

The Petition offers three obviousness ground based on Min:

- Obviousness on Min alone (Ground 4),
- Obviousness in combination with Jeong (Ground 6),
- Obviousness in combination with Davis (Ground 8).

Petitioners do not use those obviousness grounds to provide any additional evidence to address the shortcomings of Min in disclosing the elements of any of the four independent grounds. In other words, nowhere in any of those obviousness

grounds do Petitioners offer any additional arguments or evidence for meeting ***the elements of the independent claims***. Instead, all the arguments in those grounds are directed to elements of specific dependent claims. The Petition relies entirely on Ground 2 in order to meet the elements of the independent claims. Pet., 73–74, 83–84, 89–90; Ex2001 ¶¶ 57–58, 61–62, 65–66.

With regard to Ground 4 (Min alone), neither the Petitioners nor Dr. Giachetti identifies any claim element for any independent claim that would be supplied by another reference or piece of knowledge in combination with Min. Pet., 73; Ex1002 ¶¶ 253–254. The Petition suggests that a POSITA could mix variations from different embodiments based on boiler plate language in Jung, but does not identify any such embodiments, nor any variations, and does not suggest any combination. Pet., 67. Thus, Ground 4 does not offer any further evidence concerning the independent claims, and fails to render each independent claim, and the claims that depend from those independent claims, obvious for the reasons discussed above for Ground 2. Ex2001 ¶¶ 57–58.

Ground 4 does discuss dependent Claim 6. Pet., 73–75. However, because Petitioners have not shown that Min discloses every element of Claim 1, Min cannot render obvious Claim 6, which depends from Claim 1.<sup>4</sup>

With regard to Ground 6, the Petitioners and Dr. Giachetti assert that the Min in combination with Jeong render obvious claims 8 and 20. Claims 8 and 20 are dependent claims (from claims 1 and 18, respectively) that add additional elements of a plurality of cyclones in parallel and divider plates. The Petition does not suggest that Jeong teaches any element of claim 1 or 18. Pet., 83–84. Min in combination with Jeong does not render obvious claims 8 and 20 because Min does not disclose the elements of claims 1 and 18, as explained above for Ground 2. See Ex2001 ¶¶ 61–62.<sup>5</sup>

With regard to Ground 8, the Petitioners and Dr. Giachetti assert that the Min in combination with Davis render obvious claims 2 and 13. Claims 2 and 13 are

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<sup>4</sup> Patent Owner does not concede that Petitioners have shown that the elements of Claim 6 are present in the asserted prior art, or that there is a motivation to combine the various embodiments and references discussed.

<sup>5</sup> Patent Owner does not concede that Petitioners have shown that the elements of claims 8 or 20 are present in Jeong, or that there is a motivation to combine the various embodiments and references discussed.

dependent claims (from claim 1 and 9, respectively) that add additional elements concerning a flow director flow director having a flow directing surface that extends inwardly and downwardly into the cyclone chamber from the outer wall of the cyclone chamber to a position above the plate. The Petition does not suggest that Davis teaches any element of claim 1 or 9. Pet., 89–90. Min in combination with Davis does not render obvious claims 2 and 13 because Min does not disclose the elements of claims 1 and 9, as explained above for Ground 2. See Ex2001 ¶¶ 65–66.<sup>6</sup>

**C. Petitioners Failed to Show that Soler Discloses Every Element of Independent Claim 1, 9, or 18**

Petitioners have not shown that Soler discloses every element of any of the independent claim 1, 9, or 18, as explained below. Petitioners do not assert Soler against independent claim 16. Accordingly, Ground 9 does not show anticipation of any claim.

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<sup>6</sup> Patent Owner does not concede that Petitioners have shown that the elements of claims 2 or 13 are present in Davis, or that there is a motivation to combine the various embodiments and references discussed.

**1. Soler does not have a plate positioned between a cyclone chamber and a dirt collection chamber as claimed.**

Soler does not anticipate any of the Challenged Claims of the '120 Patent for at least the reason that it does not have a plate positioned between a cyclone chamber and a dirt collection chamber as is required by each of independent claims 1, 9, and 18. Because it is missing a claim limitation from each independent claim, it cannot anticipate any claim dependent from claim 1, 9, or 18.

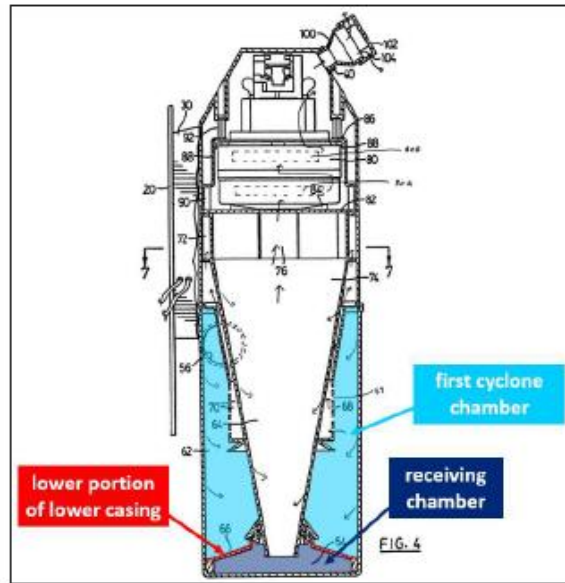
The '120 Patent describes its invention in the Summary of the Invention:

In accordance with a first embodiment, a cyclone chamber for a vacuum cleaner may have a plate positioned intermediate the opposed ends (the top end and the bottom end) of the casing of a cyclone separator so as to divide the interior of the cyclone casing into an upper cyclone chamber and a lower dirt collection area or chamber positioned beneath the upper cyclone chamber. The plate, in conjunction with the structure of the cyclone separator, produces a passage that connects the cyclone chamber and the dirt collection chamber in communication such that dirt that enters the cyclone chamber is conveyed to the dirt collection chamber. All, or at least a portion of the passage, extends laterally or outwardly.

Ex1001 at 1:45–56. A POSITA reading the '120 Patent would understand the purpose of the plate to divide an interior of a cyclone casing into a cyclone chamber and dirt collection chamber, where the cyclone chamber and dirt collection chamber are in communication such that dirt from the cyclone chamber is communicated to the dirt collection chamber through a passage. In other words, as described in the abstract, the plate *substantially* divides a volume into a cyclone chamber and dirt collection chamber—where a passage allows dirt particles to pass to the dirt

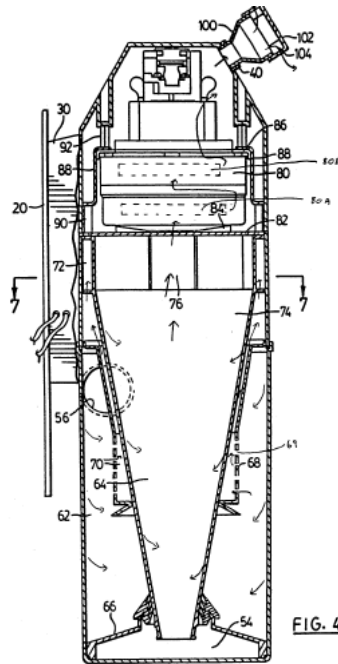
collection chamber but the dirt particles are inhibited from returning to the cyclone chamber by the plate. Ex1001 at Abstract (“...a plate having a cyclone chamber surface and positioned to substantially divide the cyclone separator into a cyclone chamber and a dirt collection chamber...”). Although the paragraph quoted in the block quote above refers to a “first embodiment,” there are no embodiments of the inventive plate that are not positioned in this way. A POSITA reading the Challenged Claims of the ’120 Patent would understand the claimed plate is positioned to allow dirt to pass from the claimed cyclone chamber to the claimed dirt collection chamber. Ex2001 ¶ 69.

The Petition ignores this plain understanding of the invention in order to fit the claim language onto Soler. As explained in the Petition, Soler has two cyclone separators. Pet., 92. Petitioners then argue that the cyclone chamber of ***the first cyclone separator*** is the claimed “cyclone chamber” and that dirt receiving chamber of ***the second cyclone separator*** is the claimed “dirt collection chamber.” Pet., 92–94; *see also* Ex1002 ¶¶ 334–335. Petitioners and Dr. Giachetti annotate Figure 4 from Soler accordingly:



Pet., 93. Petitioners' mapping of the claimed cyclone chamber and dirt collection chamber onto Figure 4 of Soler makes no sense in context of the invention of the '120 Patent. Ex2001 ¶ 70.

The "dirt collection chamber" to which Petitioners point receives its dirt from the second cyclone chamber, not from the first cyclone chamber. Soler explains that the air first enters the first cyclone chamber, where larger and heavier dirt is separated and collects on top of the lower casing, which is labeled as 66 in Figure 4:



Ex1009 at 6:16–25; Fig 4. The air then leaves the first cyclone chamber and travels to the second cyclone chamber. In the second cyclone chamber, finer dirt particles are separated which then are deposited in the receiving chamber, labeled as 54. *Id.* at 6:25–37. In other words, the first cyclone chamber and the later “dirt collection chamber” are not in communication as described by the patent. Ex2001 ¶ 70.

Neither Petitioners nor Dr. Giachetti allege that the second cyclone chamber, which is in communication with the receiving chamber [the alleged “dirt collection chamber”], is the claimed cyclone chamber. *See, e.g.*, Pet., 95–96 (referring to “the cyclone chamber (*i.e.* Soler’s first cyclone chamber)”). They do not allege this because they cannot—there is no plate or other element that divides the second cyclone chamber from its receiving chamber. Therefore, Petitioners and Dr. Giachetti have to convolute the claim language to rely on the first cyclone

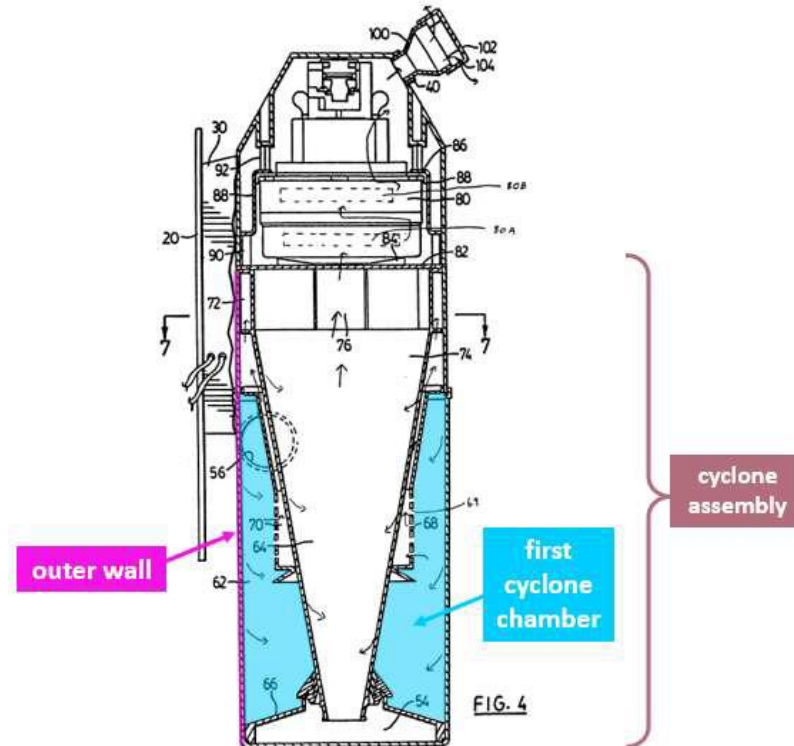
chamber as the cyclone chamber and the second receiving chamber as the dirt collection chamber. Ex2001 ¶ 71.

The receiving chamber is located near the bottom of the backpack unit. But as explained in Soler, and as seen in Figure 4, the receiving chamber receives dirt from the secondary cyclone chamber, not the first cyclone chamber. There is no passageway for dirt to pass from the first cyclone chamber into the receiving chamber:

The air travels through passage 70 to second air entry port 72. Second air entry port 72 imparts a tangential flow to the air causing the air to circulate in a cyclonic pattern *within second cyclone chamber 74*. The finer dirt particles are *deposited in receiving chamber 54* and the cleaned air is evacuated from the second cyclone chamber through second cyclone air exit 76.

Ex1009 at 6:31–37 (emphasis added); Ex2001 ¶ 72.

In order to argue that the first cyclone chamber and the later receiving chamber are the single “cyclone separator” claimed in claims 1, 9 and 18, or the single cyclonic unit in claim 18, the Petition just points generally to Soler’s total “cyclone assembly”:



Pet., 94; *see also* Ex1002 ¶¶ 325–326. But as explained above, in the context of the '120 Patent, a POSITA would understand a cyclone separator unit to be a cyclone chamber and its collection bin. The Soler embodiment multiple cyclone separators, but a POSITA would not consider the first cyclone chamber and the later receiving chamber together as a single cyclone separator. Ex2001 ¶ 73.

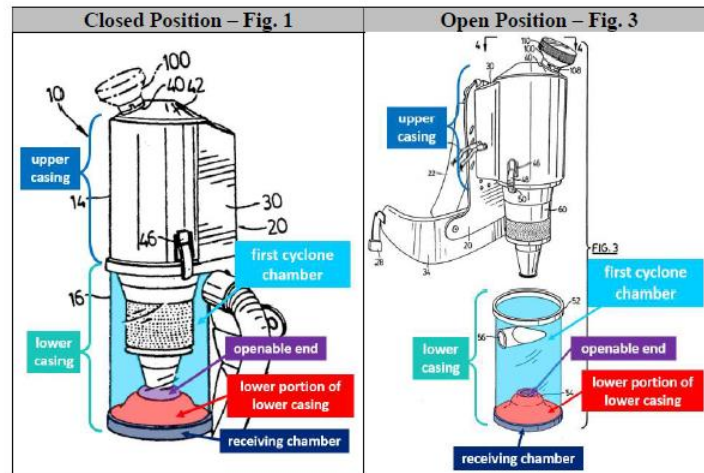
Petitioners have failed to identify, and Soler does not disclose, a cyclone separator or cyclone unit comprising “a cyclone chamber and a dirt collection chamber” with “a plate positioned between the cyclone chamber and the dirt collection chamber.” Although Petitioners focus their analysis on claims 9 and 18, they state that claim 1 would be met “for the same reasons.” Pet., 92, fn. 15. But claim 1 is not anticipated for the same reasons explained above. A POSITA would

understand claim 1 to require the plate to be positioned in a cyclone separator between the cyclone chamber and dirt collection chamber. Ex2001 ¶ 73.

Furthermore, while the '120 Patent does describe and claim cleaning apparatuses with multiple cyclones, it describes each individual cyclone as having its own divider plate. *See, e.g.*, Ex1001 at claim 8, claim 20. This further supports a POSITA's understanding that the inventive plate is one that divides the cyclone separator and cyclone chamber of a single cyclone unit. Ex2001 ¶ 74.

Furthermore, even if a POSITA were to consider the first cyclone chamber and the unrelated receiving chamber as a cyclone separator, a POSITA would not consider there to be a plate between them as that term is used in the claims of the '120 Patent. For example, the lower portion of lower casing has no passage by which dirt can pass between the first cyclone chamber and the receiving chamber, defeating the purpose of the plate in the '120 Patent. *See, e.g.*, Ex1001 at Abstract, 1:45–56; *see also* Ex2001 ¶ 75.

Finally, the Soler vacuum is emptied by removing the casing from the upper portion of the vacuum:



Pet., 99–102. The “lower portion of lower casing” that Petitioners and Dr. Giachetti describes as a plate does not move in any way relative to the first cyclone chamber or the dirt collection chamber, and thus is not moveable as required by claims 1 and 9 of the ’120 Patent. Ex2001 ¶ 76. There is no movement of the plate (the “lower portion of lower casing”) that facilitates the emptying of the cyclone chamber. On the contrary, it is the removal of the whole lower casing that allows the user to empty the bin.

## VI. CONCLUSION

For the foregoing reasons, Petitioners failed to meet 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.

DATED: December 12, 2024

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 7484, according to the word count tool in Microsoft Word.

DATED: December 12, 2024

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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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