

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DYSON TECHNOLOGY LIMITED AND DYSON, INC.,
Petitioners,

v.

OMACHRON INTELLECTUAL PROPERTY INC.,
Patent Owner.

Case No. IPR2024-01233

U.S. PATENT NO. 9,301,666

PETITION FOR *INTER PARTES* REVIEW

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LIST OF EXHIBITS

Exhibit No.	Description
Ex1001	U.S. Patent No. 9,301,666 (“’666Patent”)
Ex1002	Declaration of Robert Giachetti
Ex1003	<i>Curriculum Vitae</i> of Robert Giachetti
Ex1004	File History of U.S. 9,301,666 (App. No. US14/489,646)
Ex1005	U. K. Patent Application GB2399780A to Liddell (“Liddell”)
Ex1006	U.S. Patent No. 7,770,256 to Fester (“Fester256”)
Ex1007	Certified English Translation of German Patent 357279C to Schmidt (“Schmidt”)
Ex1008	U.S. Patent Publication No. US2005/0198770 to Jung (“Jung”)
Ex1009	U.S. Patent No. 7,547,336 to Fester (“Fester336”)
Ex1010	U.S. Provisional Patent Application No. 60/593,125 (“Fester336 Provisional”)
Ex1011	U. K. Patent Application GB194963A to Lehmann (“Lehmann”)
Ex1012	U.S. Provisional Patent Application No. 60/521,466 (“Fester256 Provisional”)
Ex1013	U.S. Patent No. 5,504,412 to Chan (“Chan”)
Ex1014	Certified English Translation of Spanish Patent No. ES43816 to Dayer (“Dayer”)
Ex1015	Spanish Patent No. ES43816 to Dayer (“DayerES”)
Ex1016	U.K. Patent Application No. GB2035787 to Merritt (“Merritt”)
Ex1017	U.K. Patent Application No. GB2372434A (“Organ”)

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Exhibit No.	Description
Ex1018	Certified English Translation of French Patent No. 1,094,603 to Martelliere (“Martelliere”)
Ex1019	Exhibit H-1 to PO’s Infringement Contentions
Ex1020	PO’s Opening <i>Markman</i> Brief in <i>SharkNinja Operating LLC v. Dyson, Inc.</i> , No. 1:23-cv-12372 (D. Mass.) (Dkt. 122)
Ex1021	German Patent 357279C to Schmidt (“DESchmidt”)
Ex1022	French Patent No. 1,094,603 to Martelliere (“MartelliereFR”)
Ex1023	National Judicial Caseload Profile https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distpr ofile1231.2023.pdf
Ex1024	The Parties’ Revised Proposed Schedule in <i>SharkNinja Operating LLC v. Dyson, Inc.</i> , No. 1:23-cv-12372 (D. Mass.)
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Ex1028	Japanese Patent Publication No. JPS48107459U to Tsukuji (“TsukujiJP”)
Ex1029	U.S. Patent No. 1,861,261 to Carson (“Carson”)
Ex1030	U.S. Patent No. 3,425,192 to Davis (“Davis”)
Ex1031	Certified English translation of Swiss Patent No. CH203,675 to Peter (“Peter”)
Ex1032	Swiss Patent No. CH203,675 to Peter (“PeterCH”)

LIST OF CHALLENGED CLAIMS

Reference Number	Claim Limitation
Claim 1	
[1pre]	A hand vacuum cleaner comprising an air treatment portion and a main body, the air treatment portion comprising a first cyclonic cleaning stage, a second cyclonic cleaning stage and a pre-motor filter, the hand vacuum cleaner comprising:
[1a]	a fluid flow path extending from a dirty air inlet to a clean air outlet and the dirty fluid inlet defines a passage extending along a passage axis
[1b]	the first cyclonic cleaning stage is positioned in the fluid flow path and comprises a first cyclone having a dirt collection region wherein the dirt collection region has an openable bottom;
[1c]	the second cyclonic cleaning stage is positioned in the fluid flow path downstream from the first cyclonic cleaning stage and comprises a central longitudinal axis, the second cyclonic cleaning stage comprising a plurality of cyclones in parallel that are arranged around a central portion and, after exiting the second stage cyclones, air enters an upper portion of the central portion and exits the central portion at a position below the upper portion where the air enters the central portion;
[1d]	the pre-motor filter is positioned in the fluid flow path downstream from the second cyclonic cleaning stage and comprises an upstream side and a downstream side wherein the central longitudinal axis extends through a volume occupied by the pre-motor filter; and,
[1e]	the main body comprises a fluid flow motor housing for a fluid flow motor that is disposed in the fluid flow path downstream from the pre-motor filter, wherein the fluid flow motor has a rotational axis and a projection of the rotational axis intersects the central longitudinal axis and the fluid flow motor housing is secured to only a portion of a sidewall of the air treatment portion,

[1f]	wherein the fluid flow motor and a handle of the hand vacuum cleaner are positioned rearward of the second cyclonic cleaning stage;
[1g]	the dirt collection region is positioned beneath and vertically aligned with the cyclones of the first and second cyclonic cleaning stages and the pre-motor filter; and,
[1h]	the handle comprises an upwardly extending portion when the hand vacuum cleaner is positioned on a horizontal surface, the upwardly extending portion extends away from the fluid flow motor housing and the passage axis of the dirty fluid inlet intersects the upwardly extending portion of the handle.
Claim 2	
2	The hand vacuum cleaner of claim 1, wherein the fluid flow motor is provided in a rear portion of the hand vacuum cleaner and the pre-motor filter is provided forward of the rear portion.
Claim 3	
3	The hand vacuum cleaner of claim 1, wherein each of the second cyclones are smaller than the first cyclone.
Claim 4	
4	The hand vacuum cleaner of claim 1, wherein the fluid flow motor is rearward of the second cyclonic cleaning stage and air travels downwardly through the central portion prior to travelling rearwardly to the fluid flow motor.
Claim 5	
5	The hand vacuum cleaner of claim 1, wherein the dirty air inlet has a central longitudinal axis and a projection of the dirty air inlet central longitudinal axis intersects the second cyclonic cleaning stage.
Claim 6	
6	The hand vacuum cleaner of claim 1, wherein a lower end of the pre-motor filter is located below a lower end of the second cyclonic cleaning stage.
Claim 7	

7	The hand vacuum cleaner of claim 1, wherein a portion of a handle of the hand vacuum cleaner is located above a lower end of the pre-motor filter.
Claim 8	
8	The hand vacuum cleaner of claim 1 wherein an end of the handle is mounted to the hand vacuum cleaner at a position adjacent an upper end of the first cyclonic cleaning stage.
Claim 9	
9	The hand vacuum cleaner of claim 1 wherein the dirt collection region has a pivotally openable bottom.
Claim 10	
10	The hand vacuum cleaner of claim 9 wherein the bottom is openable when the dirt collection region is attached to the main body.
Claim 11	
11	The hand vacuum cleaner of claim 1 wherein the rotational axis of the fluid flow motor is displaced from the passage axis in a direction parallel to the central longitudinal axis.
Claim 12	
12	The hand vacuum cleaner of claim 11 wherein the rotational axis of the fluid flow motor is parallel to the passage axis.
Claim 13	
13	The hand vacuum cleaner of claim 1 further comprising a hand grip region which is positioned between the upwardly extending portion of the handle and a portion of the sidewall of the air treatment portion.

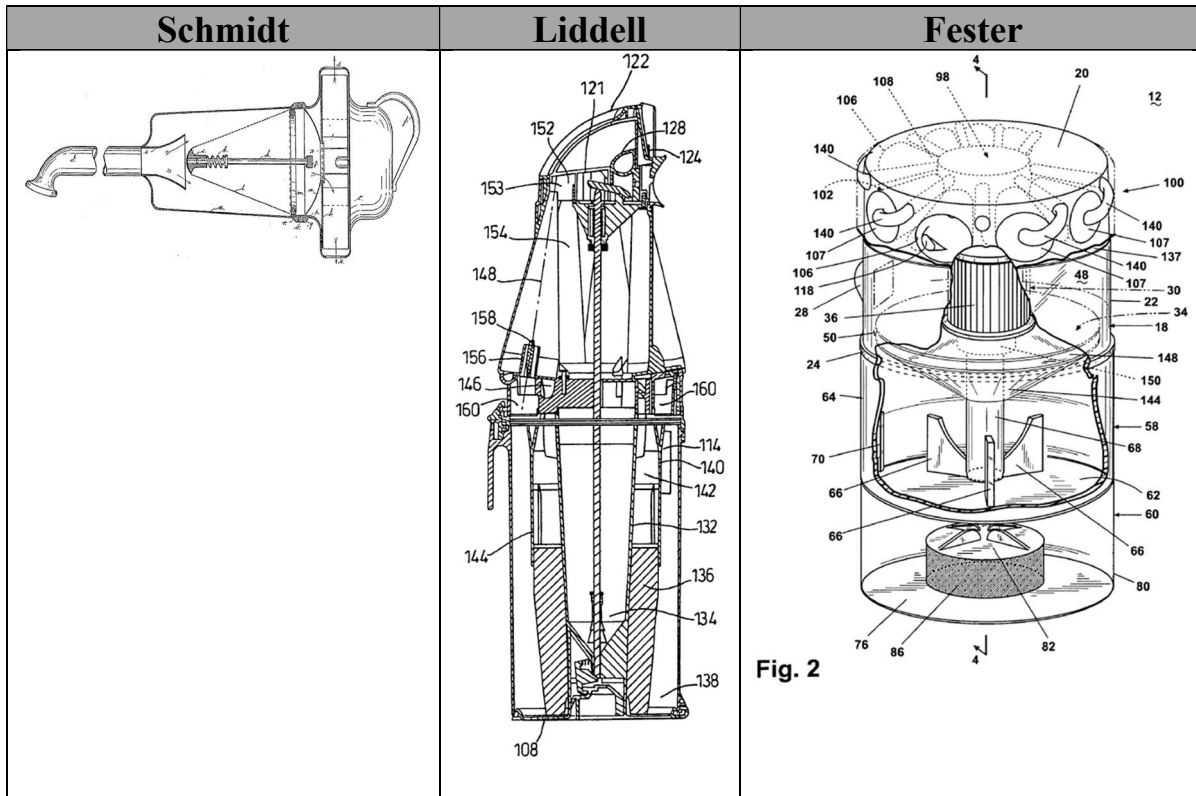
I. INTRODUCTION

The '666Patent states that it relates to a vacuum with “a dirt bin having an off-centre inlet,” which according to the '666Patent, “enhance[es] dirt retention in the dirt chamber.” Ex1001, 1:18-20, 2:9-12.

However, none of the claims are directed to an “off-centre inlet,” but instead cobble together a grab-bag of well-known features in a configuration that does not solve any technical problem. This grab bag is sizeable: the '666Patent's only independent claim is nearly three quarters of a page long, and recites standard vacuum cleaner features such as an air inlet and outlet, two cyclonic cleaning stages, a pre-motor filter, a motor, and a handle, with configuration limitations that solve no technical problem, including three different “axes” that must intersect or extend through other components; a handle that extends “upwardly” and “away” from the motor, and negative limitations, such as the motor housing being “secured to only a portion of a sidewall.” Ex1001, 7:66-8:47. But taking well-known vacuum cleaner components such as cyclone stages, motors, and handles, and tacking on more-and-more intersecting “axes” and other configuration limitations, does not solve a technical problem, and does not make the claims inventive.

The prior art renders obvious this configuration of well-known components, which a POSA would have been motivated to combine through the simple substitution of like components. For example, nearly all claim limitations are taught

by taking a prior art hand vacuum, such as Schmidt, and substituting its filtration unit (a bag filter) with Liddell's filtration unit (a cyclonic separator), and the remaining limitations are rendered obvious by substituting Liddell's second cyclonic cleaning stage with Fester's second cyclonic cleaning stage:



Ex1021; Ex1005; Ex1006.

Through the simple substitution of like components (e.g., a bag filter for a cyclone separator, and one secondary cyclone separator for another), the prior art renders obvious all claims of the '666Patent.

II. STANDING (§42.104(A))

Petitioners certify that the '666Patent is available for *inter partes* review, and

that Petitioners are not barred or estopped from requesting *inter partes* review to challenge the claims on the grounds herein.

III. RELIEF REQUESTED (§42.104(B))

Petitioners respectfully request review and cancellation under 35 U.S.C. § 311 of claims 1-13 as follows:¹

Prior Art	Prior Art Date	Basis (pre-AIA)
German Patent 357279C ("Schmidt")	May 11, 1921	§102(b)
U.K. Patent Pub. GB2,399,780A ("Liddell");	September 29, 2004 (provisional filing date)	§102(b)
U.S. Patent 7,770,256 ("Fester256")	April 30, 2004	§102(e)
U.K. Patent Pub. GB194963A ("Lehmann")	March 22, 1923	§102(b)
U.S. Patent 7,547,336 ("Fester336")	December 13, 2004 (provisional filing date)	§102(e)
U.S. Patent Pub. US2005/0198770 ("Jung")	September 15, 2005	§102(b)

¹ Petitioners do not concede that any claims satisfy other requirements for patentability that cannot be raised in IPR, including §§ 101 and 112.

Grounds	Claims	Basis
1	1-13	§103; Schmidt, Liddell, Fester256
2	1-13	§103; Lehmann, Fester336, Jung

IV. OVERVIEW OF THE '666PATENT

The '666Patent, titled “Surface Cleaning Apparatus,” issued from Application No. 14/489,646, filed September 18, 2014, and claims priority to a provisional application filed December 12, 2006. Ex1001.

A. The Claims

The '666Patent has 13 claims: independent claim 1 and dependent claims 2-13. Claim 1 is nearly three-quarters of a column long and directed to a vacuum with standard features, including: a dirty air inlet, a clean air outlet, two cyclonic cleaning stages with a dirt collection region, a pre-motor filter, a main body with a fluid flow motor, and a handle. Ex1001, 7:66-8:47. The claims arrange these well-known features according to the intersection or relative orientation of three “axes.” Claim 1 further recites conditional and negative limitations; including how the handle extends “when” the hand vacuum “is positioned on a horizontal surface” and by limiting the motor housing to be secured to “only a portion” of a sidewall. *Id.*

B. The Specification

The '666Patent states that “the invention relates to surface cleaning apparatuses, which have a dirt bin having an off-centre inlet,” which purportedly

improves dirt retention. Ex1001, 1:16-20. However, as described above, the claims do not relate to an off-center inlet, but instead orient well-known components along various “axes” and other configuration limitations. Nothing in the ’666Patent identifies any technical problem solved by the claimed configuration, or any benefit of such configuration. Ex1002, ¶54.

C. The Prosecution History

The Examiner’s Reasons For Allowance stated that “none of the prior art is considered to make obvious the specific configuration of the claimed invention....” Ex1004, 803-04. However, the Examiner did not have the combination of references here, which when combined by simple substitution of like components renders obvious this configuration and all claims of the ’666Patent.

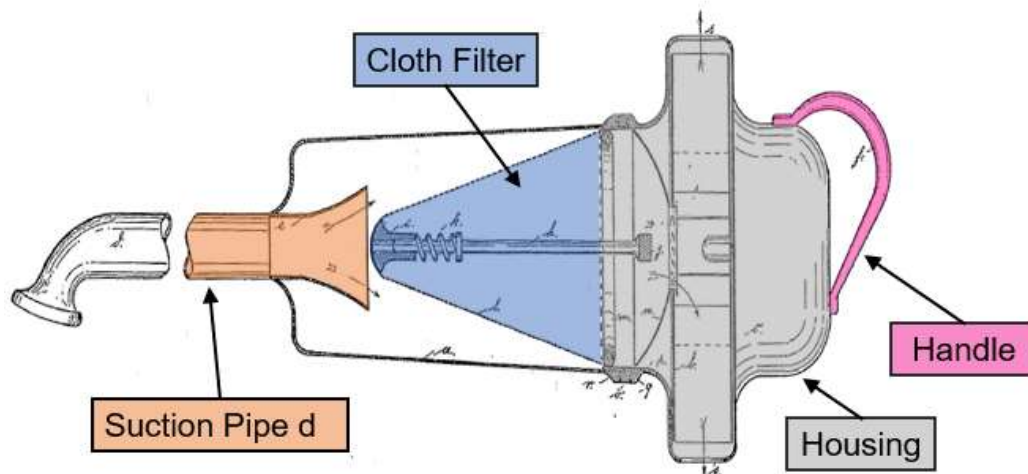
V. OVERVIEW OF THE PRIOR ART

A. Schmidt

Schmidt is a 1922 German patent. Ex1007². Schmidt teaches a handheld “vacuum cleaner” with a “filter” for separating dirt from air and “handle f” at the rear that

² Ex1007 is a certified English translation of Ex1021 originally published in German. Citations to Ex1007 are to the page, as the English translation does not include column or line numbers.

extends upwardly and away from the motor, and a “suction pipe d” with an axis that intersects the handle:

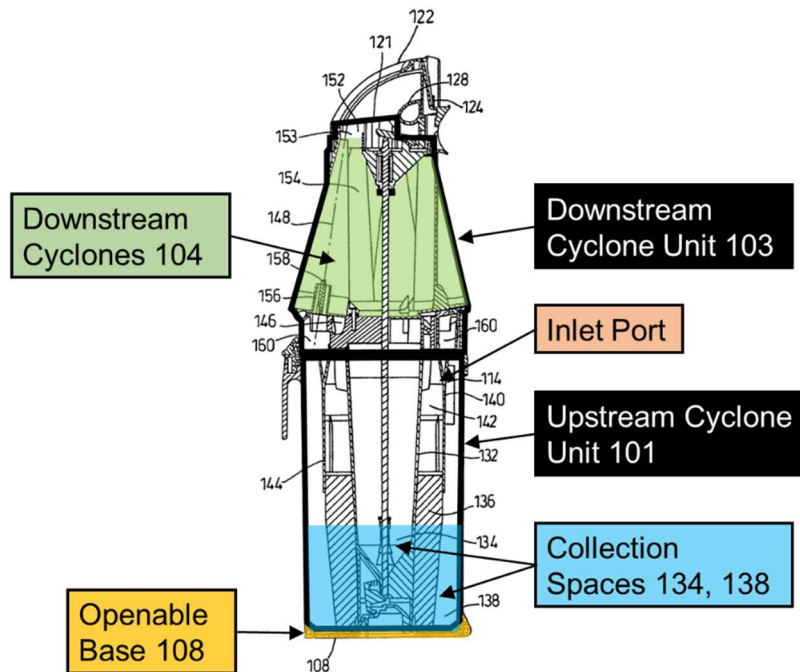


Ex1007, 1-2, Fig 1; Ex1002, ¶59.³

B. **Liddell**

Liddell is a 2004 U.K. published patent application for a vacuum cleaner with a cyclonic separation unit shown, for example, in Figure 3b:

³ All emphasis, and all coloring and annotations to figures, added unless otherwise noted. Where a figure has been otherwise altered to illustrate Petitioners’ argument, the citation to the figure is labeled as modified.



Ex1005, Fig.3b; Ex1002, ¶61.

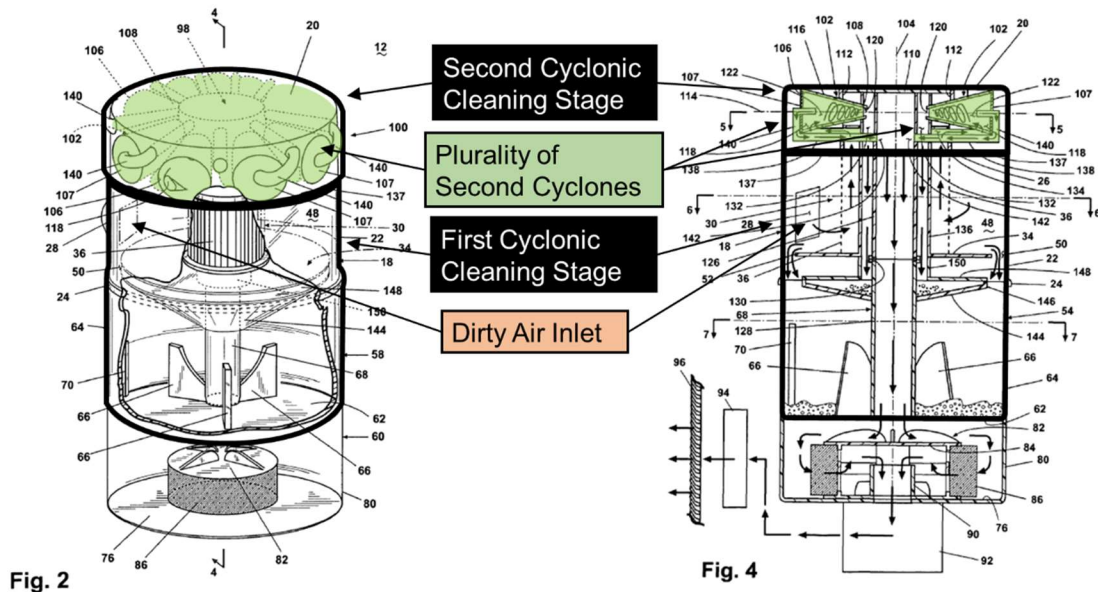
Liddell’s cyclonic separation unit has two stages: “upstream cyclone unit 101 consisting of a single upstream cyclone 102 and a downstream cyclone unit 103 consisting of a plurality of downstream cyclones 104 arranged in parallel.” Ex1005, 5:20-22. Liddell teaches a “mechanism for opening the base 108 of the cylindrical bin 106 for emptying purposes.” Ex1005, 6:23-25.

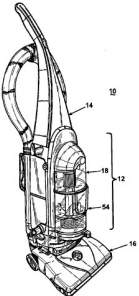
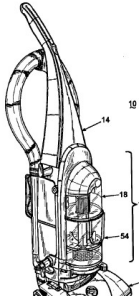
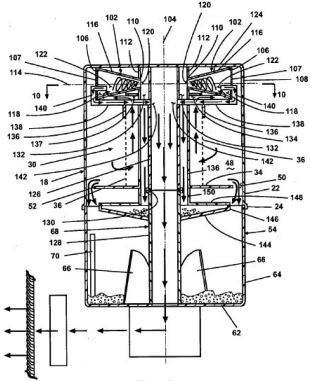
C. **Fester256**

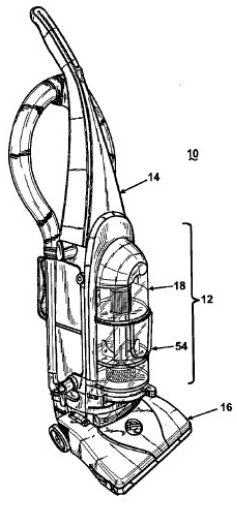
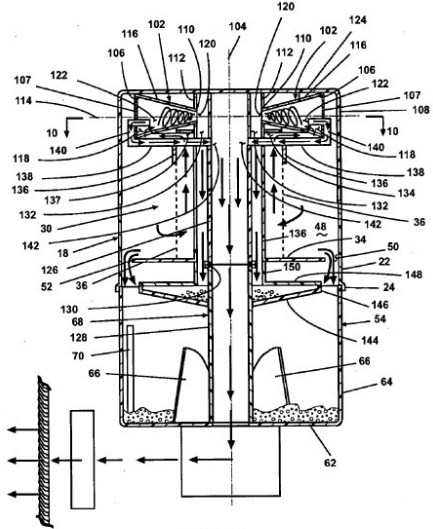
Fester256 is a U.S. patent filed on April 29, 2005, with priority to a provisional application, No. 60/521,466, filed on April 30, 2004 (the “Fester256 Provisional”). Ex1006, Ex1012.

Fester256 teaches a vacuum cleaner with two cyclonic cleaning stages, including a second cyclonic cleaning stage with a plurality of second cyclones as

shown in Figures 2 and 4. Ex1006, 2:43-3:21, 5:8-11, Figs.2-5; Ex1012, [0008]-[0012], [0039], Figs.3-4, 7-10.



<u>Fester256 Claim 1</u>	<u>Exemplary Disclosures from Fester256 Provisional</u>
1[pre] Ex1006, 9:17	Ex1012, Fig.1.  Fig. 1 See also Ex1012, [0001], [0008].
1[a] Ex1006, 9:18-24	Ex1012, Fig.1.  Fig. 1 Ex1012, Fig.9.  Fig. 9

	See also Ex1012, [0008], [0027-28], [0031-39], [c1].
1[b] Ex1006, 9:25-27	Ex1012, Fig.1.  Fig. 1 See also Ex1012, [0008], [0027], [c1].
1[c] Ex1006, 9:28-35	Ex1012, Fig.9.  Fig. 9 See also Ex1012, [0008], [0010], [0037], [0039], [0045], [c1].

1[d]

Ex1006, 9:36-38

Ex1012, Fig.3.

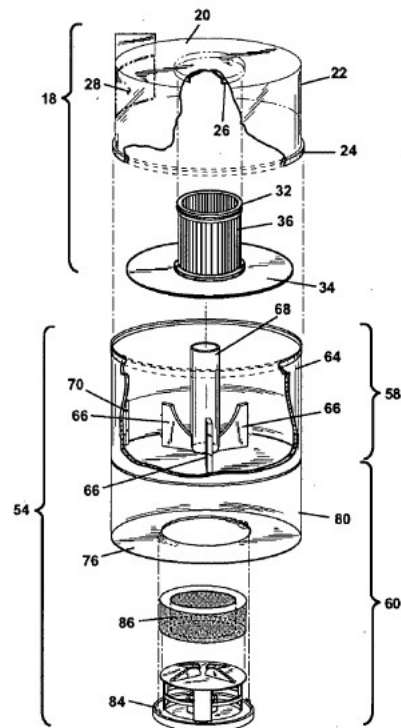


Fig. 3

See also Ex1012, Abstract, [0001], [0009], [0033-34], [0037], [c1].

1[e]

Ex1006, 9:39-47

Ex1012, Fig.9.

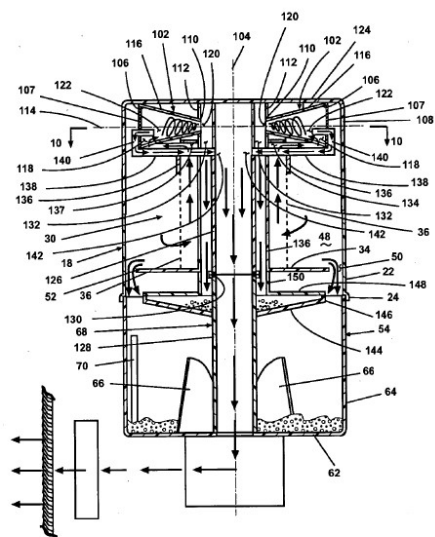


Fig. 9

Ex1012, Fig.7:

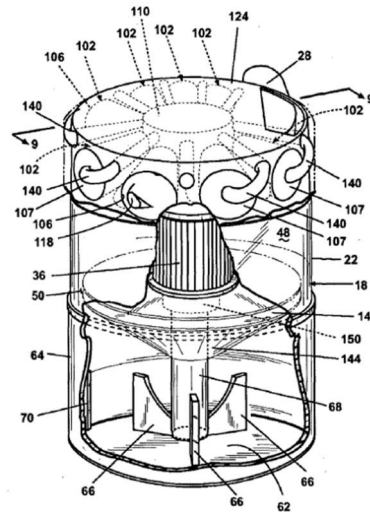


Fig. 7

See also Ex1012, Abstract, [0016], [0039-45], Fig.10, [c1].

1[f]

Ex1006, 9:48-49

Ex1012, Fig.9.

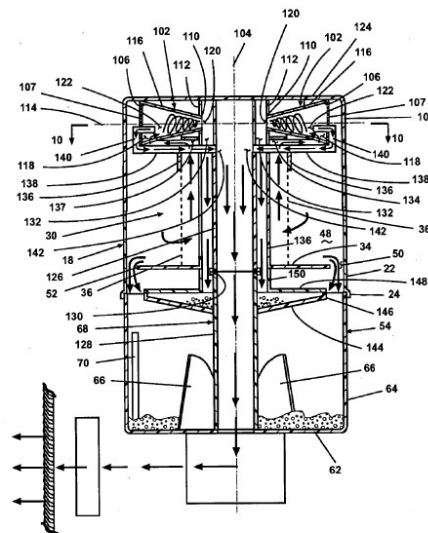


Fig. 9

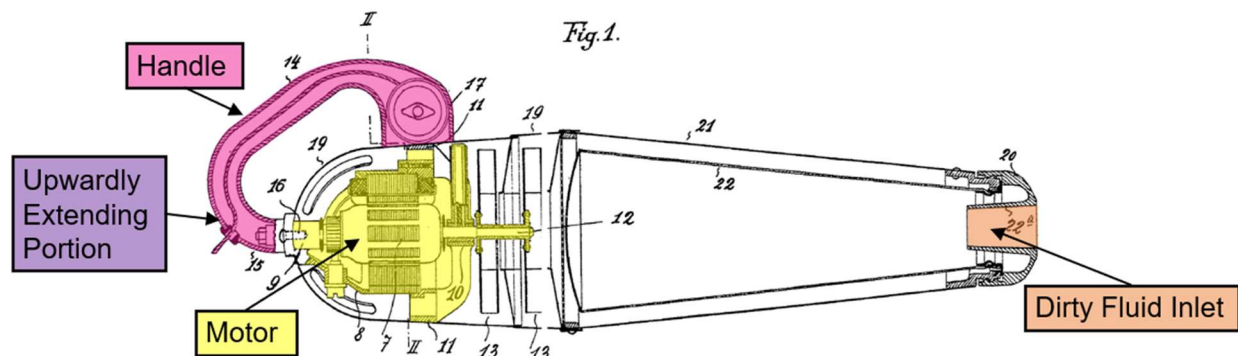
See also Ex1012, [0041], [0044].

Fester256 Provisional also provides much of the same disclosure as Fester256,

including the subject matter Petitioners rely on in Fester256. *Compare, e.g.,* Ex1006, 5:6-31, 6:27-7:13, Figs.1-5 *with* Ex1012, [0037-0045], Figs.1-4, 7-10.; Ex1002, ¶66. Throughout the Petition, Petitioner includes parallel citations to the Fester256 Provisional.

D. **Lehmann**

Lehmann is a 1923 U.K. patent for a “portable vacuum” with a “dust bag” and an “**arched handle**” with a **handle portion** extending upwardly and away from “electro-motor 7” (shaded in yellow). Ex1011, Fig.1. This **portion** of the **handle** is intersected by the passage axis of the **dirty fluid inlet 22a**:

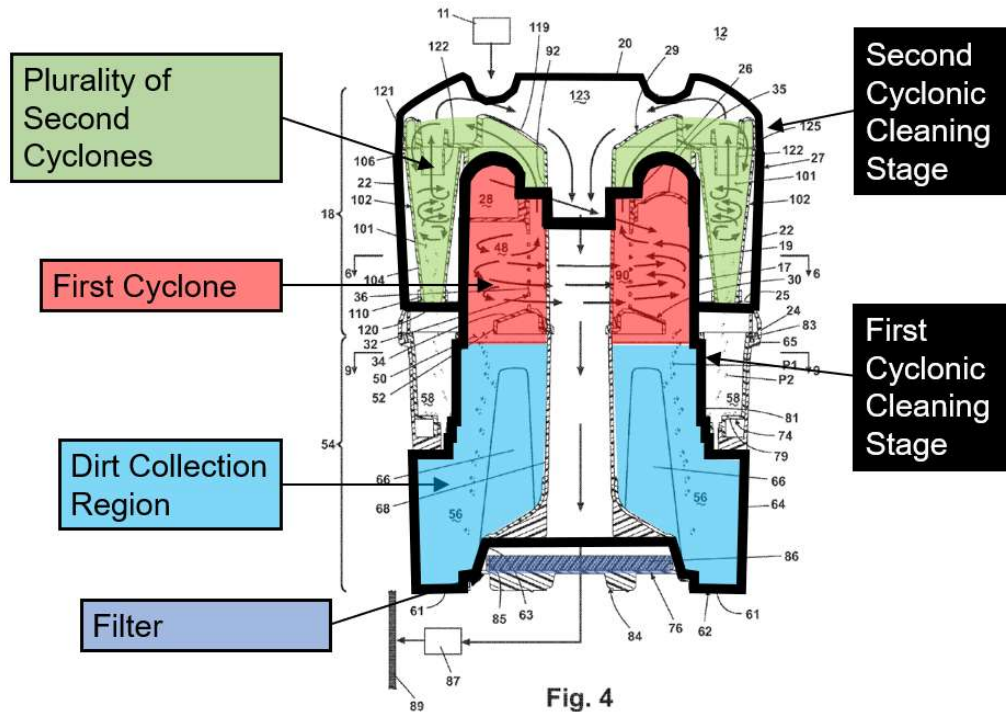


Ex1011, Fig.1; Ex1002, ¶68.

E. **Fester336**

Fester336 is a U.S. patent filed on December 28, 2005 that claims priority to Provisional Application No. 60/593,125 (the “Fester336 Provisional”), filed on December 13, 2004. Ex1009; Ex1010.

Fester336 teaches a vacuum cleaner with a first cyclone and plurality of second cyclones:



Ex1009, Fig.4; *see also* Ex1010, Fig.4; Ex1002, ¶70.

Dirty air enters the **first cyclone**, then the **second cyclones**, where it is cleaned, and exits the **second cyclones** downwardly through a central channel to a pre-motor filter, motor, and exhausted from the vacuum. Ex1009, 9:50-10:34, Fig.4; Ex1010, [Para 37]-[Para 38], Fig.4; Ex1002, ¶70.

1. Fester336 Is 102(e) Art As Of Its Provisional Date

Fester336 is 102(e) prior art as of December 13, 2004 because the Fester336 Provisional provides written description support for (1) the subject matter of at least one claim of Fester336 and (2) the subject matter Petitioners rely on in Fester336 to show the unpatentability of the Challenged Claims. Ex1009; Ex1010.

For example, the Fester336 Provisional provides support for at least claim 1

of Fester 336. Ex1002, ¶72.

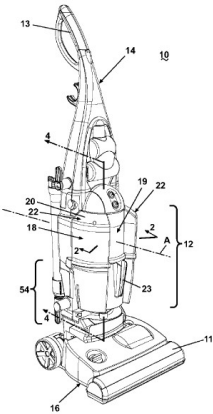
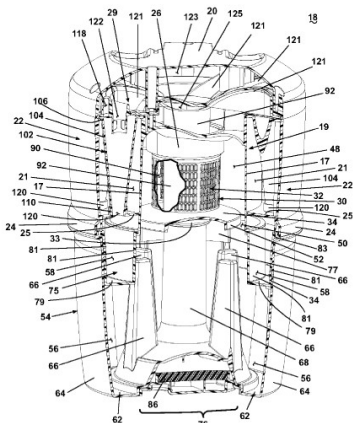
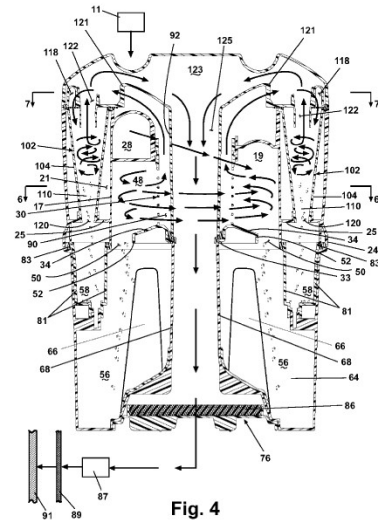
<u>Fester336 Claim 1</u>	<u>Exemplary Disclosures from the Fester336 Provisional</u>
1[pre] Ex1009, 11:2	Ex1010, [Para 1], [Para 8], [Para 20], [Claim 1], Fig.1.  Fig. 1
1[a] Ex1009, 11:3-18	Ex1010, Fig.2.  Fig. 2 Ex1010, Fig.3.

	Fig. 3 See also, [Para 21]-[Para 28], [Para 37], [Para 38], [Claim 1], [Claim 3], Fig.4.
1[b] Ex1009, 11:19-20	Ex1010, Fig.1. Fig. 1 Ex1010, Fig.4.

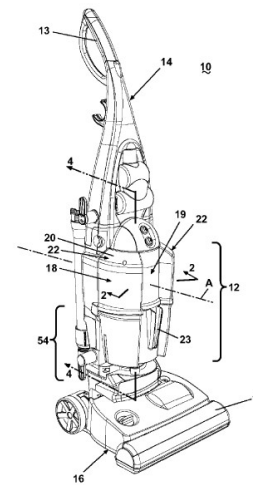


See also Ex1010, [Para 8], [Para 20],
[Para 37], [Claim 1], [Claim 3].

1[c]

Ex1009, 11:21-25

Ex1010, Fig.1.



Ex1010, Fig.4.

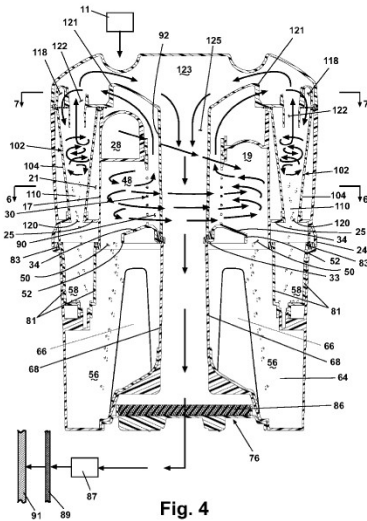


Fig. 4

See also Ex1010, [Para 8], [Para 20], [Para 37], [Para 38], [Claim 1].

Further, the Fester336 Provisional has much of the same disclosure as Fester336, including the subject matter Petitioners rely on in Fester336. *Compare, e.g.,* Ex1009, 5:33-6:10, 9:50-10:35, Figs.1-7 *with* Ex1010, [Para 24]-[Para 26], [Para 37]-[Para 38], Figs.1-7. Throughout the Petition, Petitioners include parallel citations to the Fester336 Provisional.

F. Jung

Jung 2005 U.S. published patent application for a vacuum cleaner with a cyclonic dust collecting assembly, which uses an **inner flow tube 57** to direct the downward flow of air from the cyclonic separator rearwardly toward ducting in the vacuum body:

FIG. 3

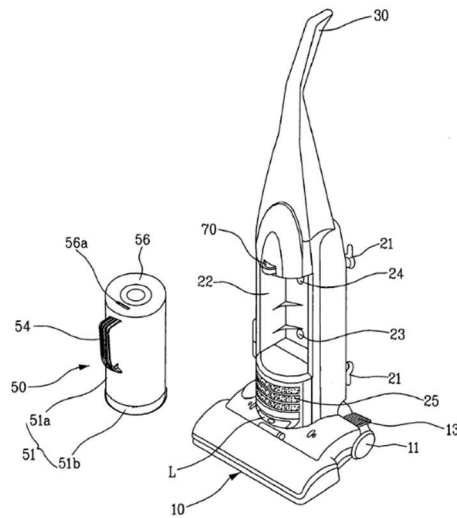
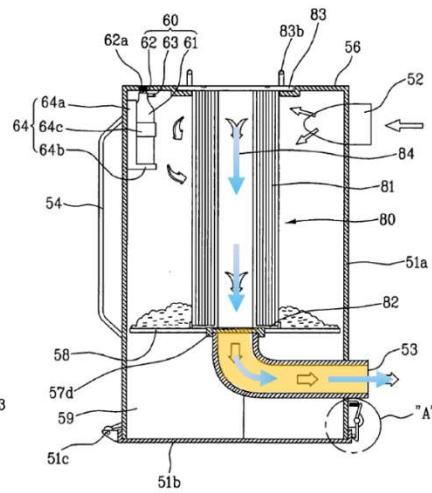
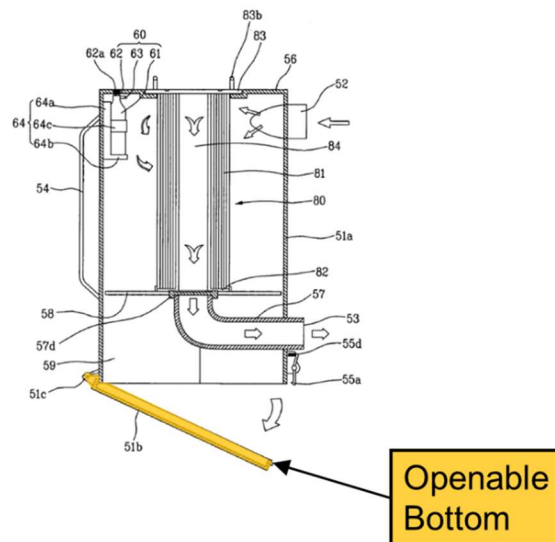


FIG. 6



Ex1008, Figs.3, 6, 12, [0097]-[0101], [0128]. Jung also teaches a pivotably openable bottom for emptying a dirt collection region of the separator, for example, as shown in Fig.8:

FIG. 8



Ex1008, Fig.8, [0123-133].

VI. LEVEL OF ORDINARY SKILL IN THE ART

A person having ordinary skill in the art (“POSA”) would have had a bachelor’s degree in mechanical engineering or a similar field and 2-3 years of experience in machine design, including machines that include fluid dynamics or fluid paths, such as vacuum cleaners. Ex1002, ¶41. Additional education could balance out less experience and vice versa, and a POSA could attain similar knowledge and experience through other means. *Id.*

VII. CLAIM CONSTRUCTION

Petitioners are unaware of any “prior claim construction determination” related to the ’666Patent. 37 C.F.R. §42.100(b). “[C]laim terms need only be construed to the extent necessary to resolve the controversy.” *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (internal citation omitted). Petitioners do not believe that 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.⁴

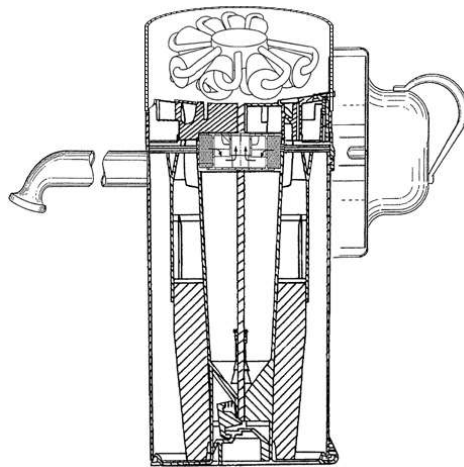
⁴ Petitioner reserves all rights to raise claim construction arguments and other arguments in litigation. Petitioners and PO submitted claim construction briefing for certain ’666Patent terms in Case No. 1:23-cv-12372, Dkts. 121-122.

VIII. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Ground 1: Schmidt in Combination with Liddell and Fester256 Renders Claims 1-13 Obvious

1. Motivations to Combine

A POSA would have been motivated to combine Schmidt, Liddell, and Fester256. Ex1002, ¶81. Schmidt teaches a hand vacuum with a cloth filter as its dust separator, and Liddell and Fester256 each teach two-stage cyclonic dust separators. Ex1002, ¶82. A POSA would have been motivated to substitute Schmidt's air separation unit with Liddell's two-stage cyclonic cleaning air treatment unit and to substitute Liddell's second cyclonic cleaning stage with Fester256's second cyclonic cleaning stage, as shown below. Ex1002, ¶83.

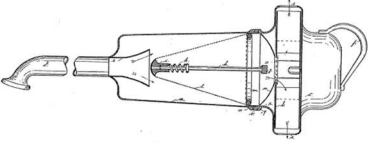
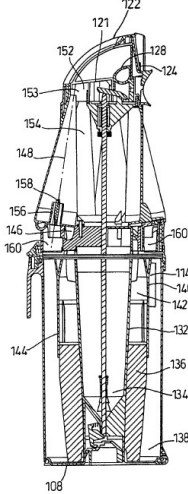
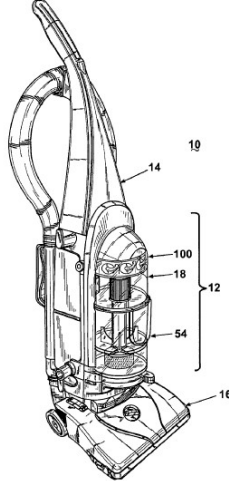


Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b.

a. Schmidt, Liddell, and Fester256 Are Analogous Art

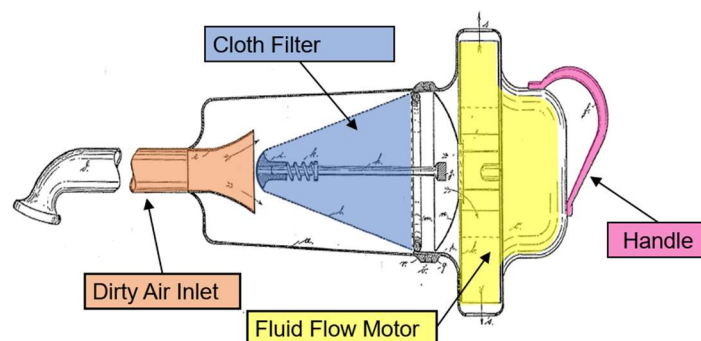
A POSA would have been motivated to combine Schmidt with Liddell and Fester256 because they are analogous art, specifically the vacuum cleaner field.

Ex1002, ¶84; *see also* Ex. 1005, 1:3-4; Ex1006, Abstract; Ex1012, [0001]; Ex1007, 1-2.

<u>Schmidt</u>	<u>Liddell</u>	<u>Fester256</u>
	 Fig. 3b	 Fig. 1

b. A POSA Would Have Been Motivated to Substitute Schmidt’s Filter with Liddell’s Cyclonic Filtration Teachings

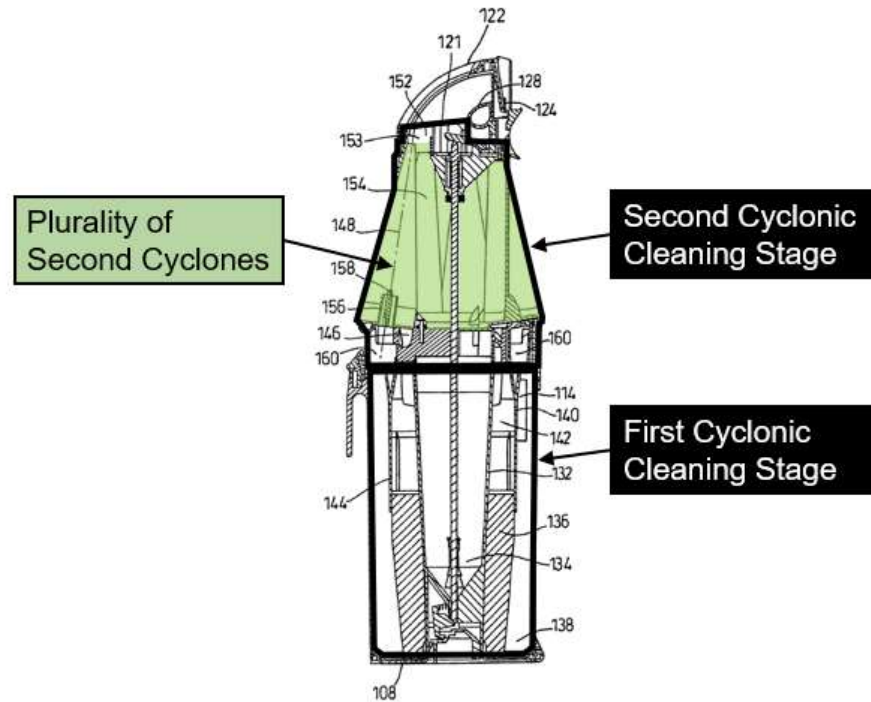
Schmidt teaches a handheld vacuum cleaner with a conically-shaped cloth filter to separate dirt from air. Ex1002, ¶86.



Ex1007, 3.

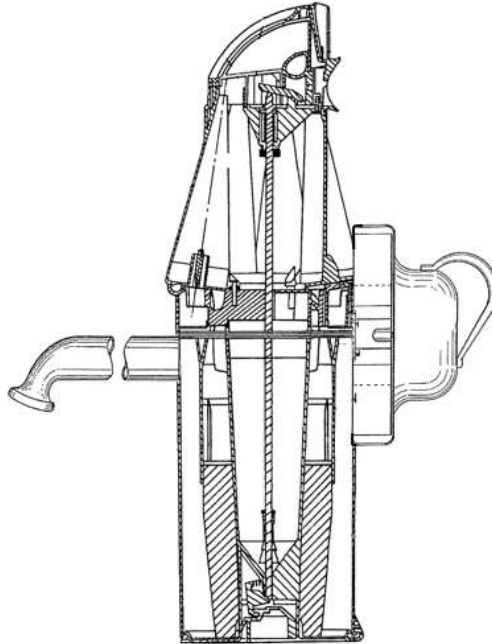
Liddell teaches a two-stage “cyclonic separation apparatus” for separating dirt

from air, where the second stage includes a plurality of second cyclones. Ex1005, 5:20-24; Ex1002, ¶87.



Ex1005, Fig.3b.

A POSA would have been motivated to substitute Schmidt's filter with Liddell's cyclonic separator, as shown below. Ex1002, ¶88.



Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b.

A POSA would have been motivated to make this combination because it would have been simple to substitute known filtration mechanisms from a cloth filter to a cyclonic filter to obtain a predictable result. Ex1002, ¶89. A POSA would have recognized that this simple substitution of these separator systems would have produced the predictable result of a handheld vacuum using cyclonic separation. *Id.* A POSA would have also recognized that the inlet of the vacuum could be moved to the other side without altering how the dust separator performed or operated. *Id.* Further, a POSA would have been motivated to modify the device to obtain the known benefits of cyclonic filtration. *Id.*

For example, as explained by French Patent No. 1,094,603 (“Martelliere”), before the 666Patent, it was known that vacuums with fabric filters lose suction as

they fill with dirt:

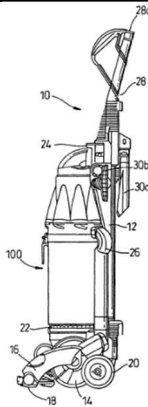
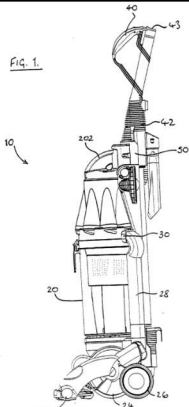
In common...vacuum cleaners, dust recovery is usually done by forcing the sucked air to pass through the weave of a fabric, which allows the gas to pass through, but retains the dust. This fabric is placed before or after the turbine; in either case, the pores of the fabric become blocked, the material accumulates behind the fabric and slows down the aspiration or evacuation of air. Most often, the container is full and there is nothing to tell, hence poor suction, yet emptying a dust bag is a recognized difficulty.

Ex1018, at 1⁵; Ex1002, ¶90. Martelliere teaches that substituting a fabric filter with a cyclonic separator “prevent[s] clogging” and results in “stable suction.” Ex1018, at 1; Ex1002, ¶91. Martelliere also notes that cyclonic separators, unlike cloth filters, can be made of a translucent material, like plastic, which allows a user to “better judge when it must be emptied.” *Id.*

These same advantages were taught by U.K. Patent Application GB2,372,434A (“Organ”), which teaches a similar cyclonic separator as Liddell.

⁵ Ex1018 is a certified English translation of Ex1022, originally published in French. Citations to Ex1018 are to the page, as the English translation does not include column or line numbers.

Ex1002, ¶92.

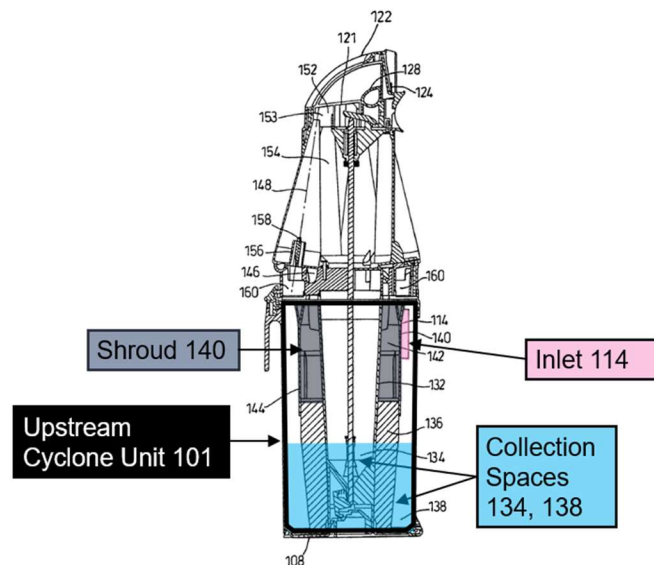
Liddell	Organ
 Fig. 1b Ex1005, Fig.1b.	 Fig. 1 Ex1017, Fig.1

For example, Organ teaches, before the '666Patent, bagless vacuums like “cyclonic” vacuums were “increasingly popular” because “[b]y avoiding the use of a filter bag as the primary form of separation, it [was] found possible to maintain a consistently high level of suction, even as the collecting chamber fills with dirt.” Ex1017, 1:8-13; Ex1002, ¶93. A POSA would have been motivated to substitute Schmidt’s separation system with Liddell’s cyclonic separator for the same reasons. Ex1002, ¶93.

Similarly, a POSA would have been motivated to use Liddell’s cyclonic separator because (1) a plurality of small cyclones would increase “the separation efficiency of the separator” and (2) the Liddell separator achieved low noise levels. Ex1005, 1:20-24, 2:1-13; Ex1002, ¶94. A POSA would have recognized that

combining Schmidt's handheld vacuum with Liddell's two-stage cyclonic cleaning system would improve Schmidt similarly with the predictable result of creating a handheld cyclonic vacuum cleaner with high separation efficiency and low noise. Ex1002, ¶¶94.

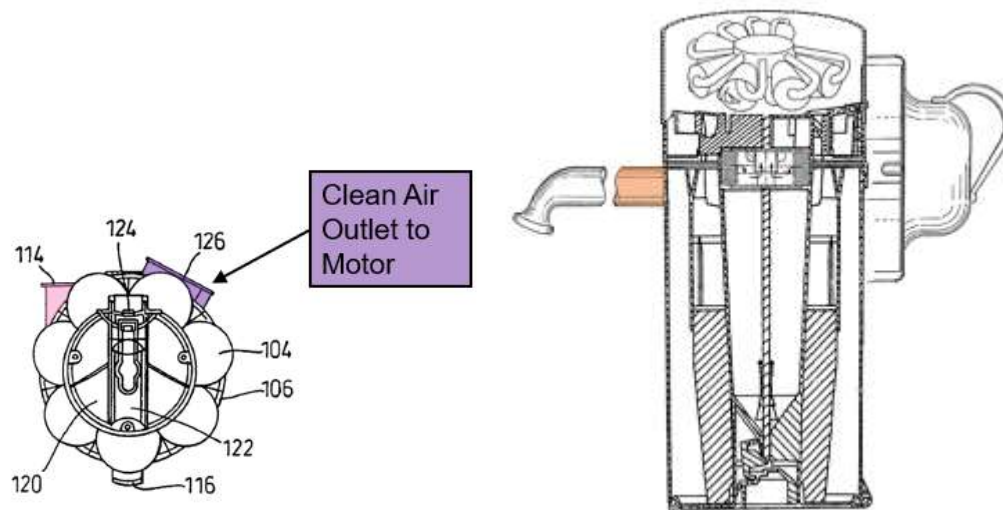
Liddell's cyclonic separator is vertically oriented, and a POSA would have been motivated to maintain this orientation in the combination with Schmidt, as shown below. Ex1002, ¶¶95. For example, Liddell's vertical orientation causes dirt to accumulate near the bottom of cyclonic separator 100 in **collection spaces 134 and 138** and away from the narrower airways in **inlet port 114** and **shroud 140**. *Id.* A POSA would have been motivated to maintain Liddell's vertical orientation to prevent these airways from clogging with accumulated debris. *Id.*



Ex1005, Fig.3b.

Further, Liddell's **inlet port 114** is oriented tangentially to cylindrical bin 106

to generate cyclonic airflow within **upstream cyclone unit 101** (Ex1005, 9:7-14) and orienting cyclonic separator 100 vertically would have further motivated POSAs to simply connect Liddell's **inlet port 114** with Schmidt's **suction pipe d** (Ex1007, 3) to introduce tangential airflow into **upstream cyclone unit 101**, as shown below. Ex1002, ¶96.



Ex1005, Fig.2c; Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b.

POSAs would further have been motivated to combine Liddell's cyclonic separator with Schmidt in a vertical orientation because vertically oriented cyclonic separators were used in other prior art handheld cyclonic suction devices, like U.K. Patent Application No. GB2035787A ("Merritt"). Ex1016; Ex1002, ¶97. Merritt teaches a suction device where air entering **inlet nozzle 8** and "**suction pipe 7** enters the **cyclone chamber 3** tangentially" creating "normal centrifugal cyclone separation" in the **chamber 3** and separated debris falls into the "**container 5** which

can be detached and emptied when full.” Ex1002, ¶97.

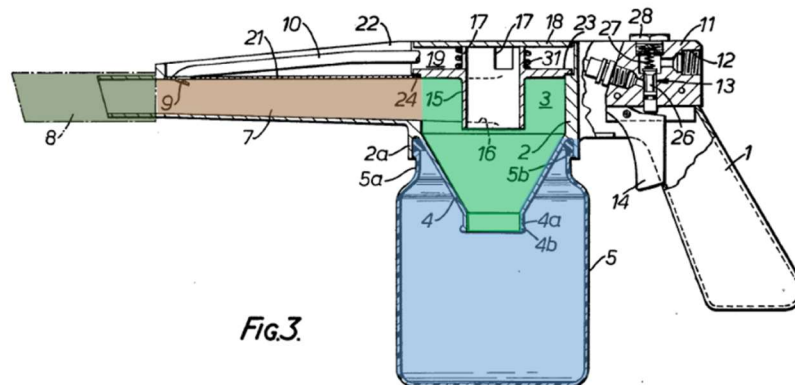
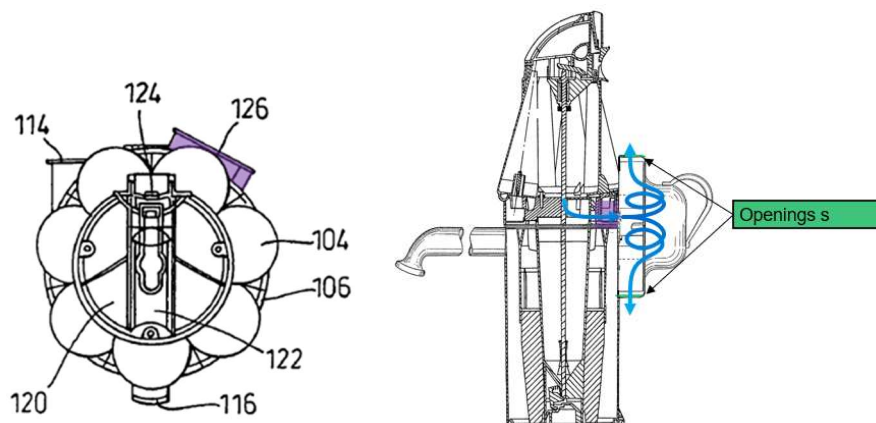


Fig.3.

Ex1016, 1:97-102, 1:107-118, 2:55-65, Fig.3.

Air exits Liddell’s cyclonic separator 100 from **outlet port 126** through downstream ducting 26 to Liddell’s motor and exits the vacuum at a post-motor outlet. Ex1002, ¶98. Similarly, when substituting Liddell’s separator in place of Schmidt’s, POSAs would have understood that air would flow rearwardly from Liddell’s separator into Schmidt’s “housing c,” through the motor, and out “**openings s**,” thereby preserving the fluid flow paths taught by Liddell and Schmidt.

Id.



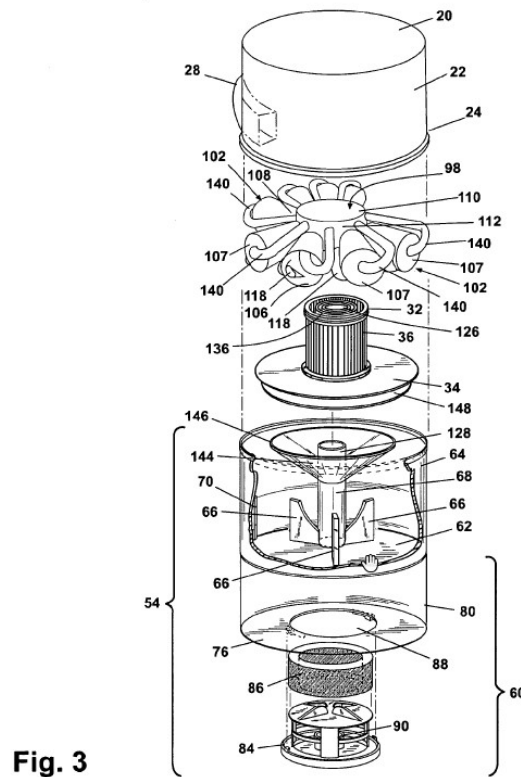
Ex1005 Figs.2c, 3b.

It would have been at least obvious to try this combination. Ex1002 ¶99. POSAs would have understood there were a finite number of recognized dust-separation solutions, including cloth filters (as Schmidt teaches) and cyclonic separators (as Liddell teaches), and a finite number of ways to combine them. *Id.* It would have been obvious to try to achieve the known benefits described above accordingly. *Id.*

A POSA would have reasonably expected success combining Schmidt's and Liddell's teachings for the reasons stated above, including because these modifications would involve a simple substitution of known elements that perform similar functions in similar ways, and because of the express motivations found in the prior art, such as Schmidt, Merritt and Liddell, to perform such substitution. Ex1002, ¶100.

c. A POSA Would Have Been Motivated to Substitute Fester256's Second Cyclonic Cleaning Stage and Subsequent Airflow Routing In Place Of Liddell's, and Add Fester256's Pre-Motor Filter

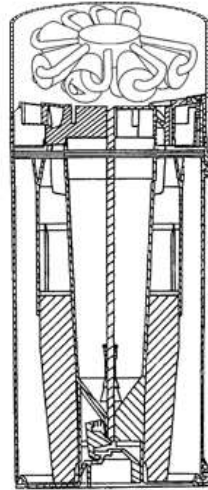
Fester256 teaches a vacuum with a two-stage cyclonic separator similar to Liddell, but teaches an alternative configuration of the plurality of second cyclones in the second cyclonic cleaning stage and airflow routing from the secondary cyclones, and further teaches a cylindrical or disc-shaped pre-motor filter in the airpath between the second cyclones and the suction motor. *See, e.g.*, Ex1006, 6:33-



Ex1006, Fig.3; *See also* Ex1012, Fig.3.

result of filtering the air and efficiently routing the airflow to the suction motor.

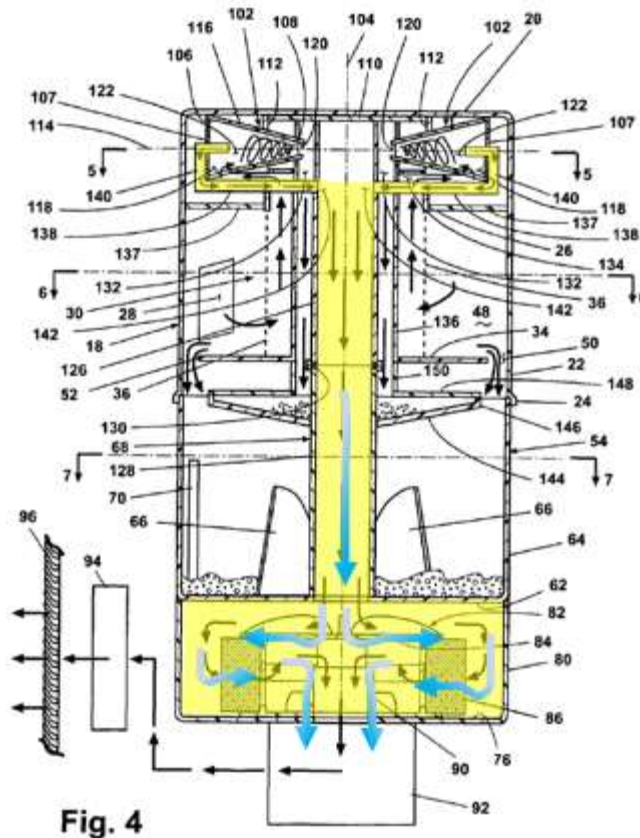
Ex1006, Fig.4, Ex1012, Figs.4, 9, Ex1005, Fig.3b; Ex1002, ¶103.



Ex1005, Fig.3b(modified); Ex1006, Figs.3-4; Ex1007, 3.

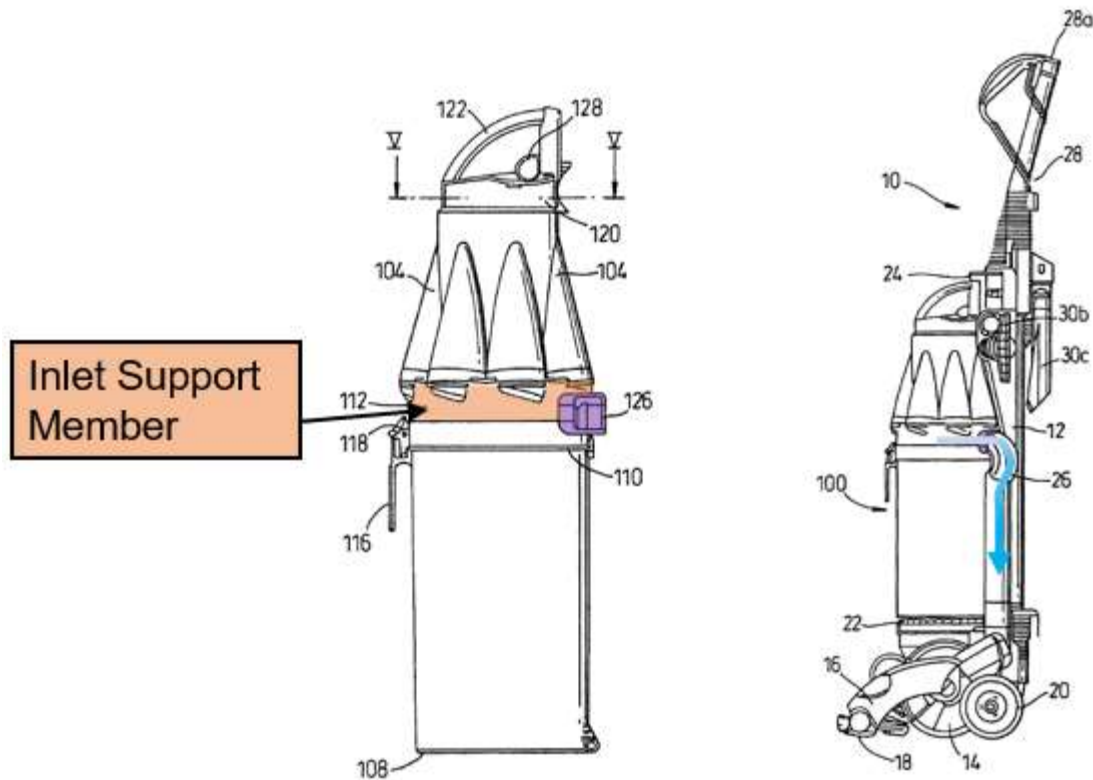
In addition, a POSA would have recognized that Fester256's second cyclonic cleaning stage would reduce the height of the device because the second cyclones are oriented horizontally instead of vertically. Ex1002, ¶102. A POSA would have understood that orienting the second cyclones horizontally would have produced a compact design that a POSA would have found beneficial in a compact format such as Schmidt's, which would have further motivated a POSA. *Id.*

Fester256 exhausts air from its horizontal second cyclones into a central channel, downward through a pre-motor filter, through a suction source, and out the vacuum, as shown below. Ex1002, ¶104.



Ex1006, Fig.4; *See also* Ex1012, Figs.4, 9.

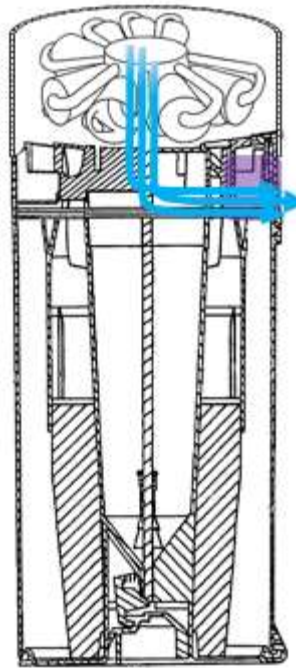
In the Liddell configuration, air from second cyclones 104 passes through inlet support member 112 and exits the second cyclonic cleaning stage at **outlet port 126** where it is directed downward through upstream ducting 26 to a motor in casing 14. Ex1002, ¶105. POSAs would recognize that substituting Fester256's second cyclonic stage for Liddell's would be simple to have like components performing the same function with similar inlet and outlet flow paths. *Id.*



Ex1005, Figs.1b, 2b.

A POSA would have understood that air would flow from Fester256's horizontal second cyclones, downward through Fester256's central channel (upper standpipe 126), into Liddell's inlet support member 112 and out of Liddell's second cyclonic cleaning stage via **outlet port 126**, when substituting Fester256's horizontal second cyclones for Liddell's vertical second cyclones, as shown below.

Ex1006, Fig.4, Ex1012, Figs.4, 9, Ex1005, Fig.3b, Ex1002, ¶106.



Ex1005, Fig.3b(modified); Ex1006, Figs.3-4; Ex1007, 3.

The resulting airflow path is short and simple, which would have further motivated a POSA to make this modification. Ex1002, ¶107. For example, Fester256 teaches that long, complicated air pathways create opportunities for air leaks, hurting suction and cleaning performance. Ex1006, 1:30-44, 2:6-21, Ex1012, [0002], [0005]-[0006]; Ex1002, ¶107. A POSA would have been motivated to direct the air in an efficient manner which minimizes such issues, as shown above. Ex1002, ¶107. A POSA would also have had a reasonable expectation of success in modifying the Schmidt/Liddell combination according to what Fester256 teaches. Ex1002, ¶108. Specifically, a POSA would have recognized that Fester256's second cyclonic

cleaning stage and airflow could be easily integrated into Liddell's air treatment system. *Id.*

A POSA also would have recognized that the Fester256 airflow routing, and in particular the downward air flow and standpipe 126, would be compatible with Liddell's dirt collection process. Ex1002, ¶109. Liddell teaches that dust "exits the smaller ends of the **downstream cyclones 104** to pass from the chamber 152 to the **collection space 134** via the **dust channel 154**," as shown below. Ex1005, 8:3-5, Fig.3b; Ex1002, ¶109.

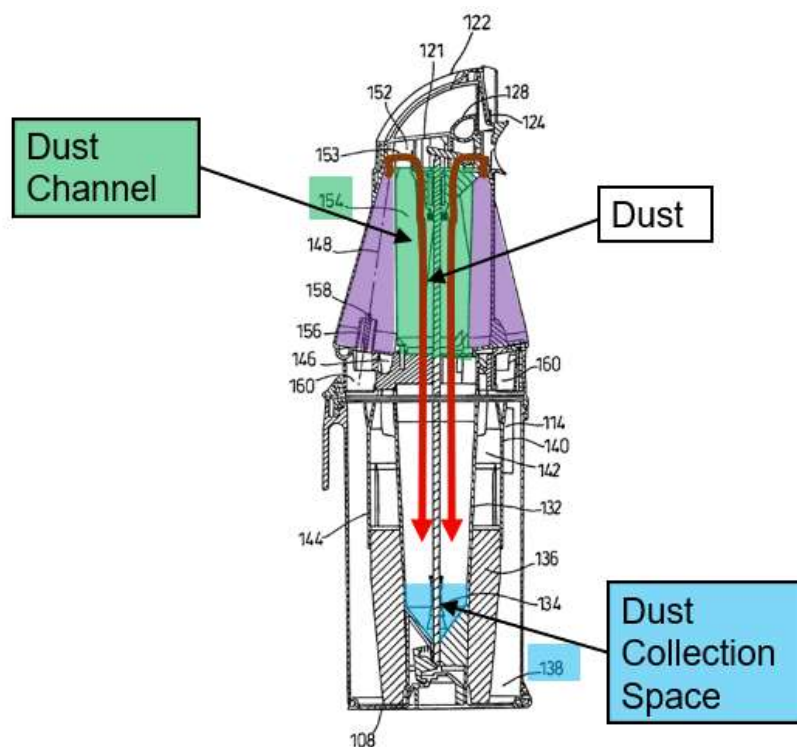
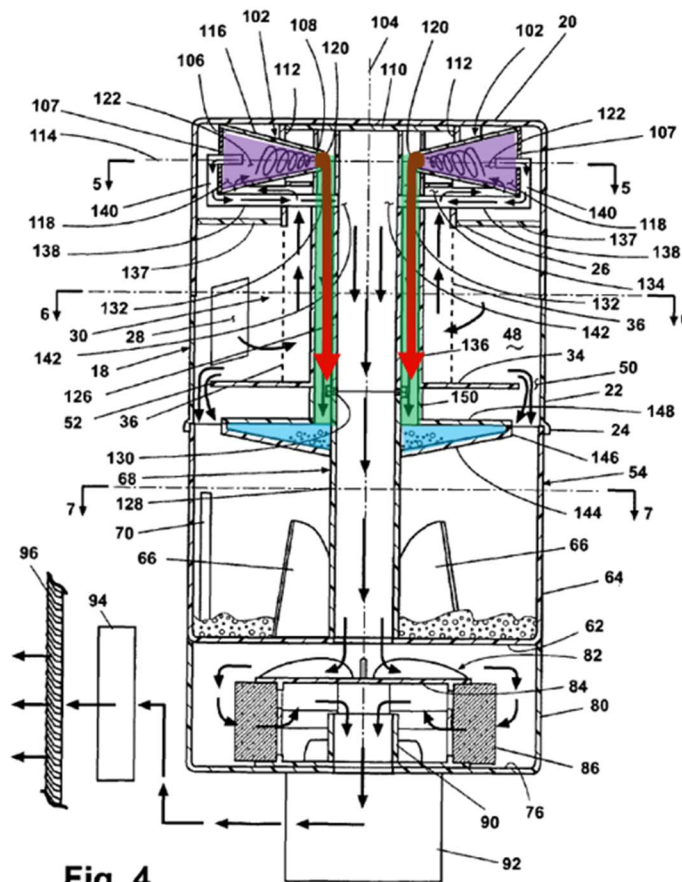


Fig. 3b

When modifying Liddell with Fester256's horizontal second cyclonic cleaning stage cyclones and standpipe 126, dirt would continue to follow a similar

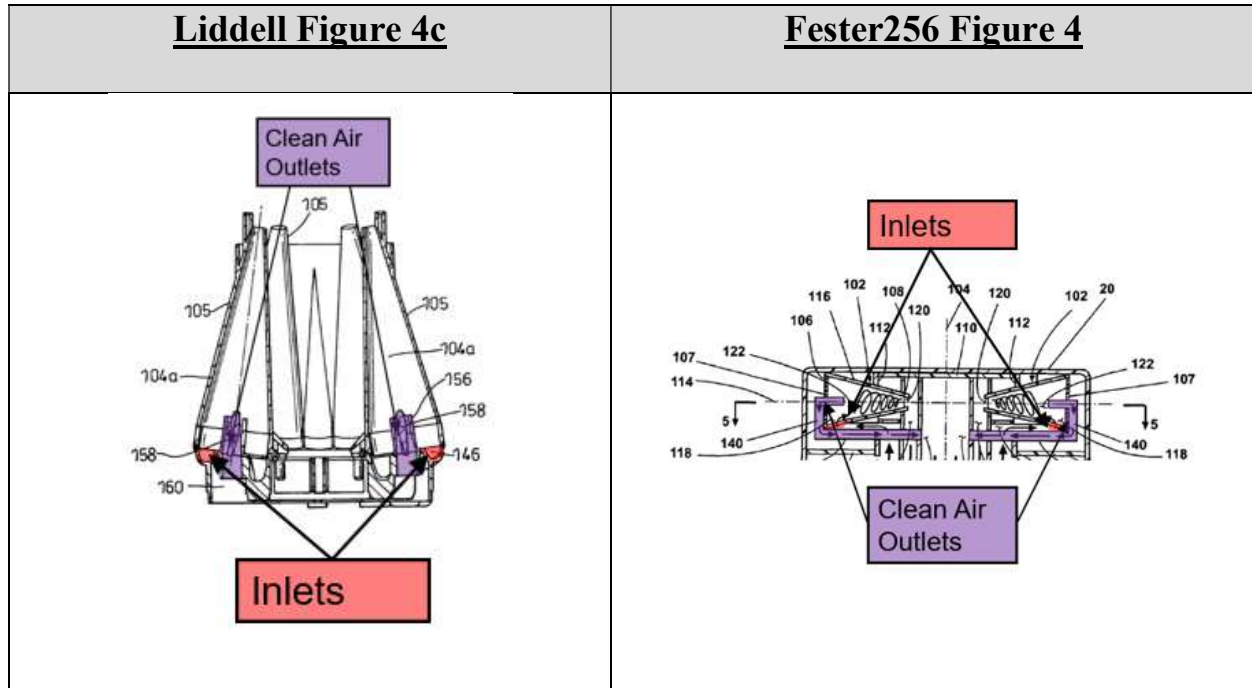
path as taught in Liddell because Fester256's standpipe 126 has an inner bore (exhaust chamber 142) for air to travel downwardly from the **secondary cyclones 102** as well as a **secondary debris chamber 132** to allow dirt to travel downwardly to the **secondary debris collection chamber 144**. Ex1002, ¶110.



Ex1006, Fig.4, 6:46-7:13, 8:53-65; see also Ex1012, Figs.4, 9, [0041]-[0045].

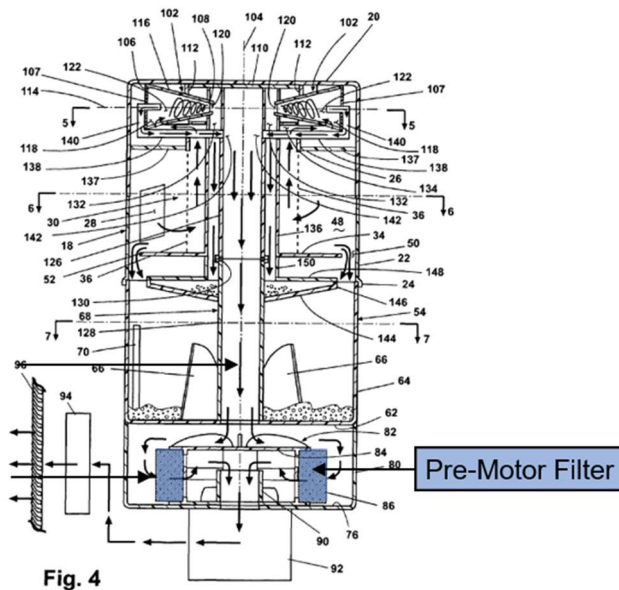
Both Fester256's and Liddell's secondary cyclones also have air **inlets** and **outlets** on the bottom of the cyclones where the inlets are fed exhaust from the first cyclonic cleaning stage below the second stage while the outlets discharge air downwardly which allows for a seamless swap of the cyclones despite their different

orientations. Ex1005, Fig.4c, 8:9-10; Ex1006, Fig.4, 5:22-23; Ex1012, Figs.4, 9, [0040], Ex1002, ¶111.



A POSA would have had a reasonable expectation of success modifying the Schmidt/Liddell combination according to what Fester256 teaches. Ex1002 ¶112. It also would have been obvious to try this combination because POSAs would have understood there were a finite number of identified possible pathways to route air from the second cyclones to the suction motor. Ex1002 ¶113. It would have been obvious to try this recognized routing to achieve the known benefits described above. *Id.*

A POSA also would have been motivated to modify the Schmidt/Liddell handheld vacuum to incorporate the pre-motor filter taught by Fester256. Ex1002, ¶114.

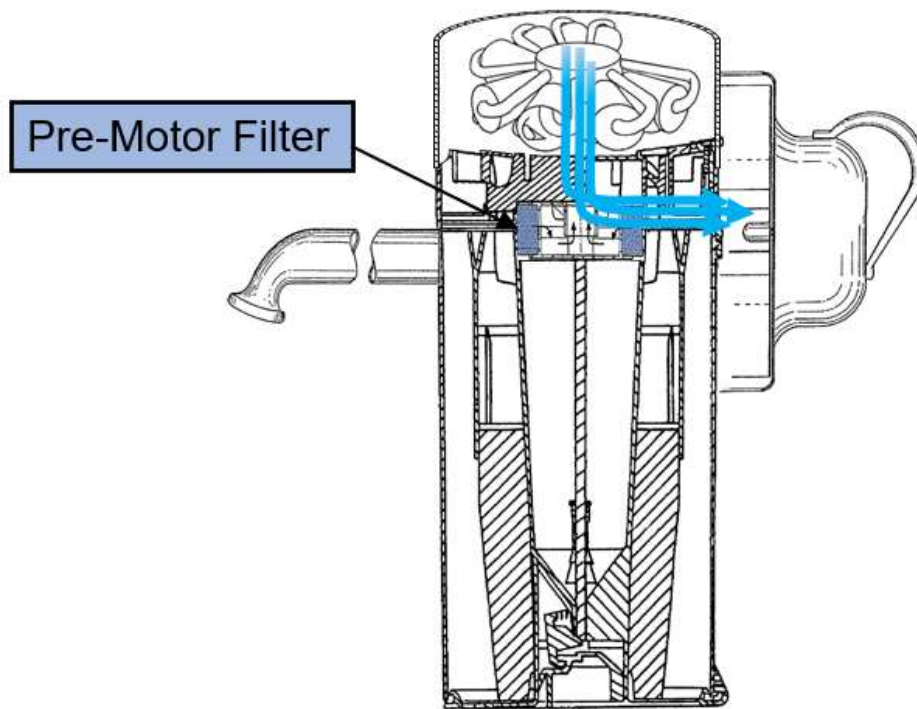


Ex1006, Fig.4; *see also* Ex1012, Figs.4, 9.

Fester256 teaches using a pre-motor filter (filter assembly 82) positioned in the airflow between the secondary cyclones and the suction motor “where particulate matter is captured, and continues on through an inlet 90 to a suction source 92.” Ex1006, 6:27-42; Ex1012, [0037]; Ex1002, ¶115. A POSA would have understood that reducing the amount of dust that reaches the suction motor increased the motor’s longevity and performance and decreased the amount of dust ultimately discharged in the air exhausted from the vacuum, and would have been motivated to incorporate Fester256’s pre-motor filter to achieve this benefit. Ex1002, ¶115. Liddell teaches “cleaned air is used to cool the motor located in the motor casing 14 before being exhausted from the vacuum cleaner 10” (Ex1005, 5:12-14), and incorporating Fester256’s pre-motor filter would further Liddell’s goal of using “cleaned air...to

cool the motor.” *Id.*

Fester256’s pre-motor filter is aligned with Fester256’s standpipe 126 and aligned axially with central vertical axis 104, as shown above. Ex1002, ¶116; Ex1006, Fig.4; Ex1012, Figs.4, 9. In the Schmidt/Fester256/Liddell combination, Fester256’s pre-motor filter would continue to be aligned on the vacuum’s central longitudinal axis, but would be moved vertically into the airflow in standpipe 126, which carries air from the second cyclones to the motor. *Id.*



Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b.

A POSA would have been motivated to locate Fester’s pre-motor filter in this location to efficiently utilize the vacant “internal space defined by the internal wall 132,” provided by Liddell’s cyclonic separator 100. Ex1005, 7:1-8; Ex1002, ¶117.

It also would have been obvious to try positioning Fester256's pre-motor filter in this location because there are a limited number of locations to house the filter. *Id.* It would have been obvious to place a pre-motor filter located in the location illustrated to achieve the known benefits described above. *Id.* It would have also been obvious for a POSA to rotate the Fester256 pre-motor filter to align the airflow that goes through the filter with Liddell's so the air can go through the center of the annual filter to exit out the side of the filter. *Id.* Fester256 teaches a "flat foam filter" as an alternative to the pre-motor filter, which would also align with Liddell's airflow. Ex1002 ¶117.

A POSA would have reasonably expected success including Fester256's pre-motor filter, second cyclonic cleaning stage, and airflow, and Liddell's air treatment system in the Schmidt/Liddell/Fester256 combination, including for the reasons above. Ex1002, ¶118.

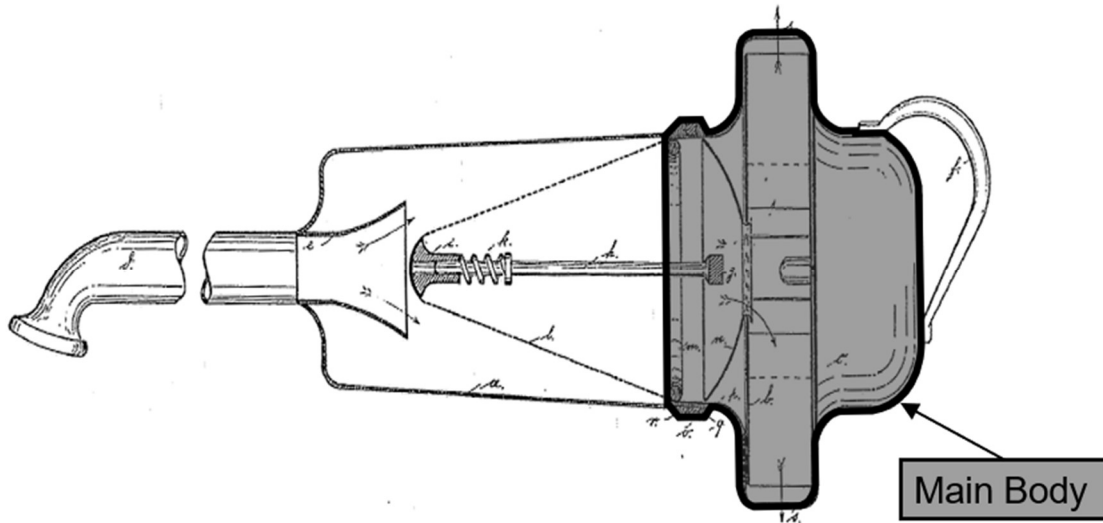
2. [1]

a. [1pre]⁶

To the extent the preamble is limiting, Schmidt in combination with Liddell and Fester256 teaches it and renders it obvious. Ex1002, ¶119. Schmidt teaches a hand "vacuum cleaner" with a **main body** (fan housing and housing c) and air

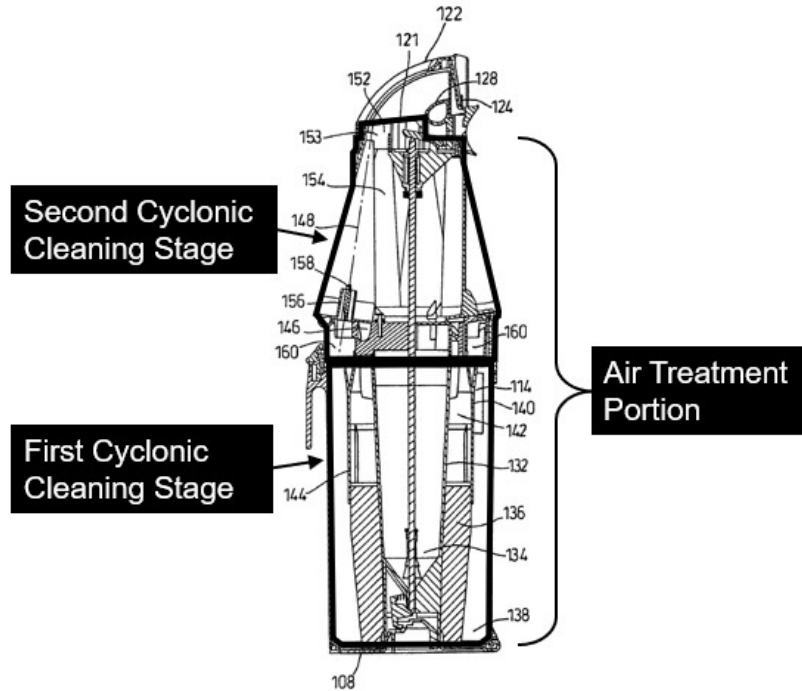
⁶ See LIST OF CHALLENGED CLAIMS.

treatment portion (filter cone 1 and jacket a) to remove dust from the air sucked into the vacuum. Ex1002, ¶120.



Ex1007, 3.

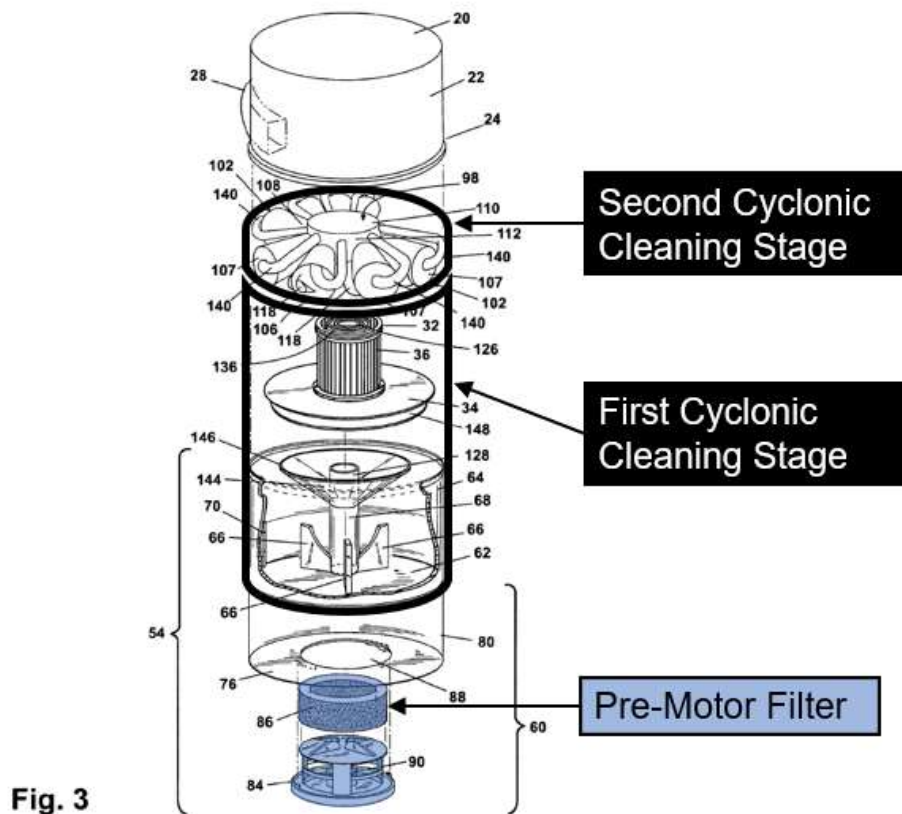
Liddell teaches a vacuum cleaner with an air treatment portion with first cyclonic cleaning stage, “upstream cyclone unit 101,” and second cyclonic cleaning stage, “downstream cyclone unit 103”. Ex1002, ¶121.



Ex1005, Figs.2a, 3b, 5:20-24.

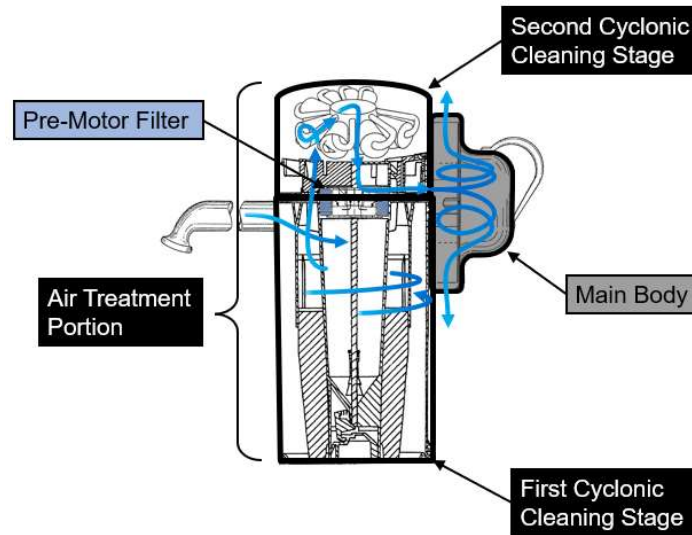
Fester256 teaches an air treatment portion comprising first (“first cyclonic chamber 48” and “dirt cup/filter chamber 54”) and second cyclonic cleaning stages (“secondary cyclone assembly 100”) and a pre-motor filter (“filter assembly 82”).

Ex1002, ¶122.



Ex1006, Fig.3, 5:6-55; *see also* Ex1012, Fig.3, [0030]-[0032], [0039]-[0040].

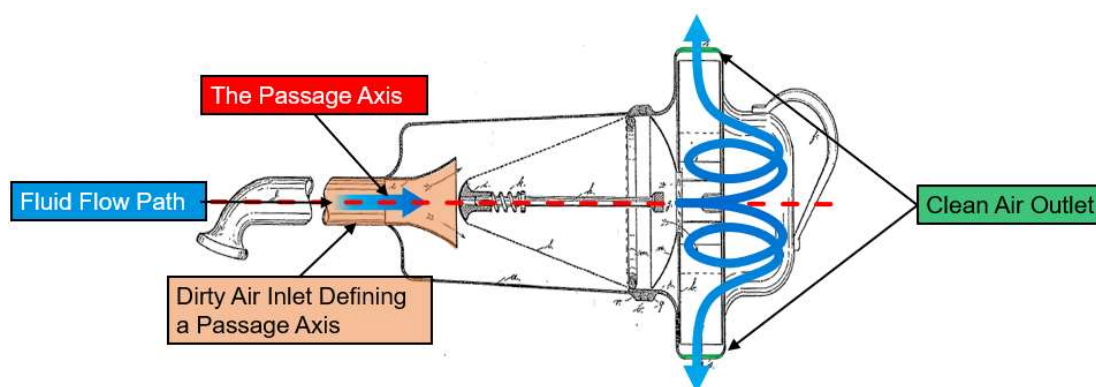
A POSA would have understood the combination of Schmidt, Liddell, and Fester256 teaches a handheld vacuum with a main body and air treatment portion including two cyclonic cleaning stages and a pre-motor filter. Ex1002, ¶¶123-24.



Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b.

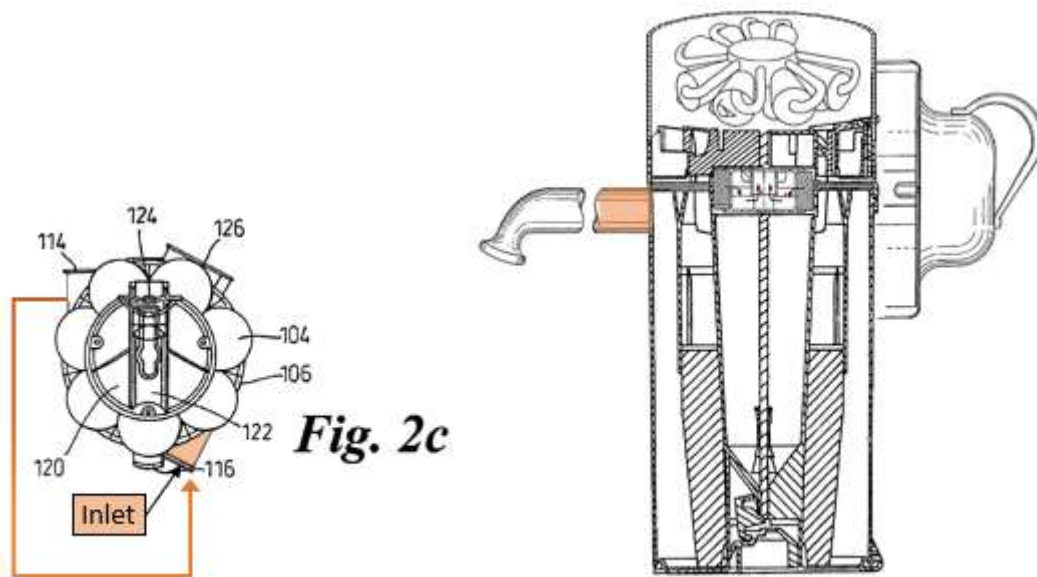
b. [1a]

Schmidt in combination with Liddell and Fester²⁵⁶ teaches this limitation. Ex1007, 3; Ex1002, ¶125. Schmidt teaches a fluid flow path from a dirty air inlet (“suction pipe d”) to a clean air outlet (“openings s in the housing”) and the dirty fluid inlet defines a passage extending along a passage axis. Ex1007, 2-3; Ex1002, ¶126.



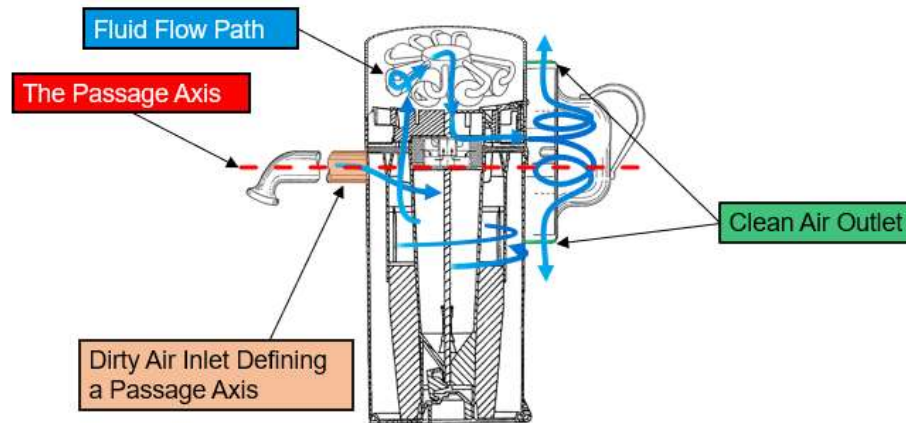
Ex1007, 3.

A POSA would have been motivated to link Liddell's inlet port 114 to Schmidt's suction pipe so there could be tangential airflow into upstream cyclone unit 101. Ex1002, ¶127. A POSA would have understood the location of the inlet and outlet on Liddell to be a simple design choice to allow for the upright handle, as there is no technical issue to rotate their locations on the body while maintaining their vertical placements. *Id.*



Ex1005, Fig.2c; Ex1007, Fig.3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b.

A POSA would have understood the Schmidt, Liddell, and Fester256 combination includes a fluid flow path extending from a dirty air inlet to a clean air outlet and the dirty fluid inlet defines a passage extending along a passage axis. Ex1002, ¶¶128-29.

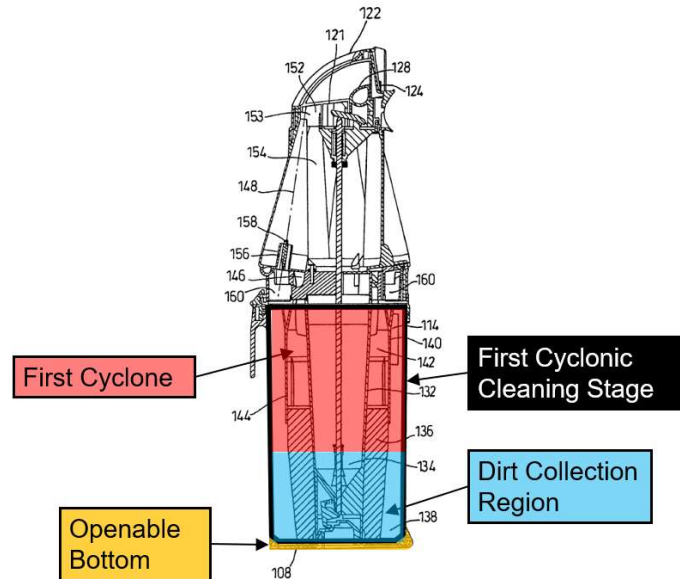


Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b.

To the extent PO argues that the “dirty air inlet” is limited to the 2-dimension area that introduces dirty air to the vacuum, that should be rejected. In the district court litigation, PO contends the tube introducing air into the vacuum is the “dirty air inlet.” Ex1019, 4-5.

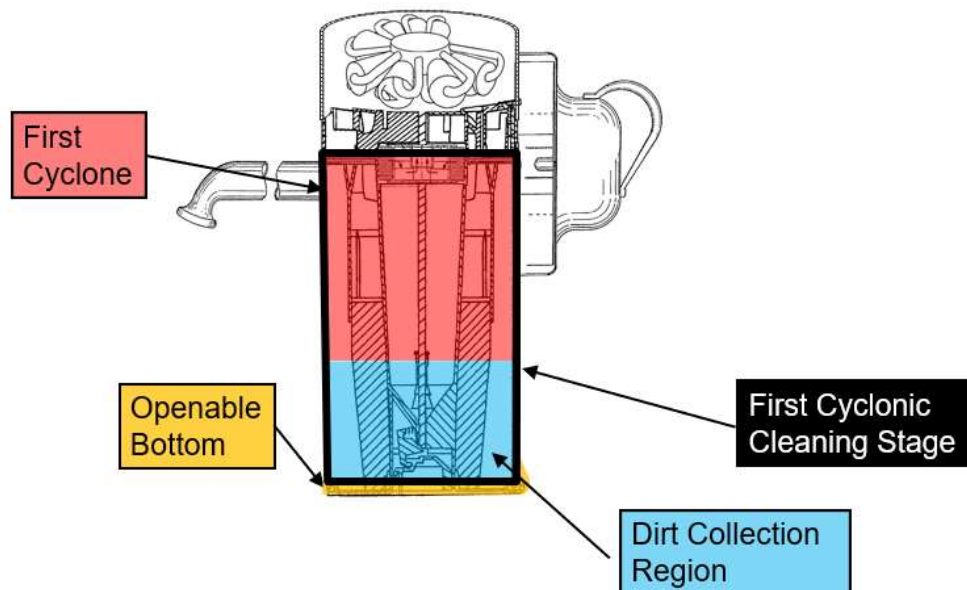
c. [1b]

Schmidt in combination with Liddell and Fester²⁵⁶ teaches this limitation. Ex1002, ¶130. Liddell teaches a first cyclonic cleaning stage (upstream cyclone unit 101) positioned in the fluid flow path that comprises a first cyclone (upstream cyclone 102) having a dirt collection region (collection regions 134, 138) wherein the dirt collection region has an openable bottom (base 108). Ex1005, 5:20-24, 6:23-25 (describing mechanism “for opening the base 108 of the cylindrical bin 106 for emptying purposes”), 7:3-6, 7:12-14, 9:11-14; Ex1002, ¶131.



Ex1005, Fig.3b.

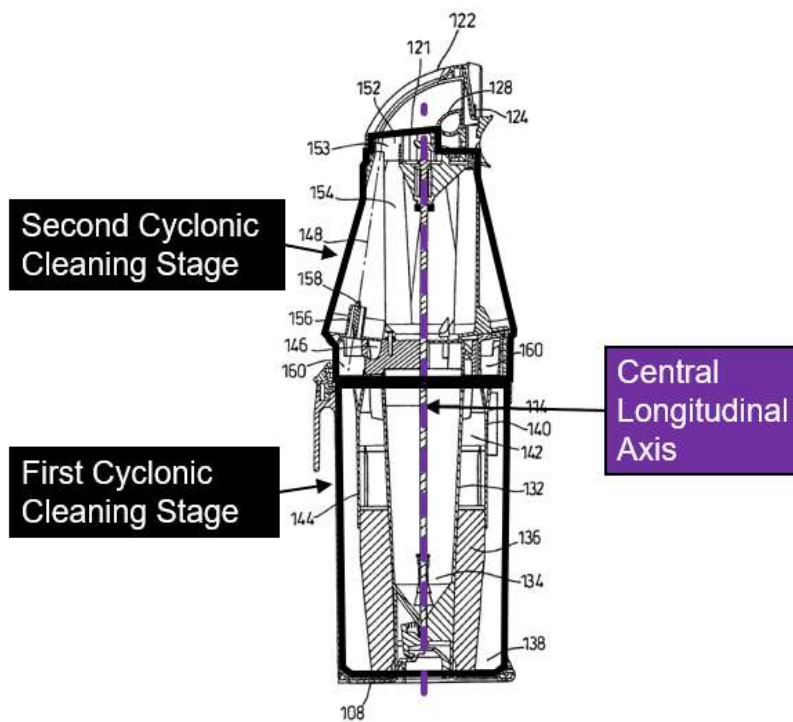
A POSA would have understood the combination of Schmidt, Liddell, and Fester256 likewise teaches this limitation. Ex1002, ¶¶132-33.



Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b.

d. [1c]

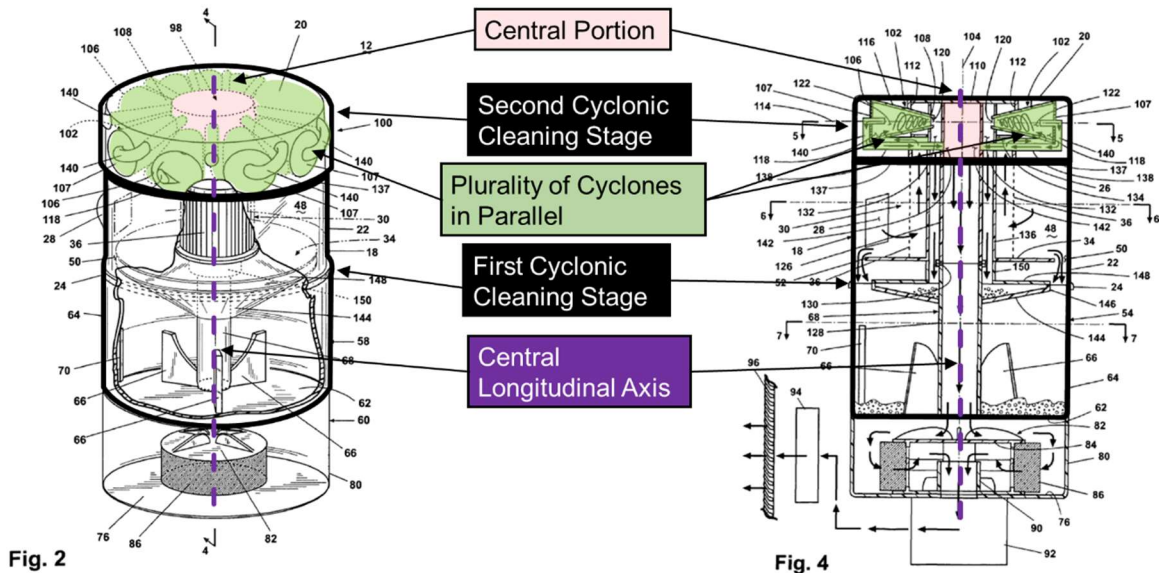
Schmidt in combination with Liddell and Fester256 teaches this limitation. Ex1002, ¶134. Liddell teaches a **second cyclonic cleaning stage** (downstream cyclone unit 103) located in the fluid flow path downstream from the **first cyclonic cleaning stage** (upstream cyclone unit 101) that comprises a **central longitudinal axis** (“central longitudinal axis 150”) with a plurality of cyclones in parallel (“downstream cyclones 104,” which are “arranged in parallel with one another”).



Ex1005, Fig.3b, 5:20-24, 6:5-10. Ex1002, ¶135.

Fester256 teaches a second cyclonic cleaning stage (“secondary cyclone assembly 100”) with a **plurality of cyclones** in parallel (secondary cyclones 102) arranged around a **central portion** (upper standpipe 126) located in the fluid flow path downstream from the first cyclonic cleaning stage (“first cyclonic chamber 48”

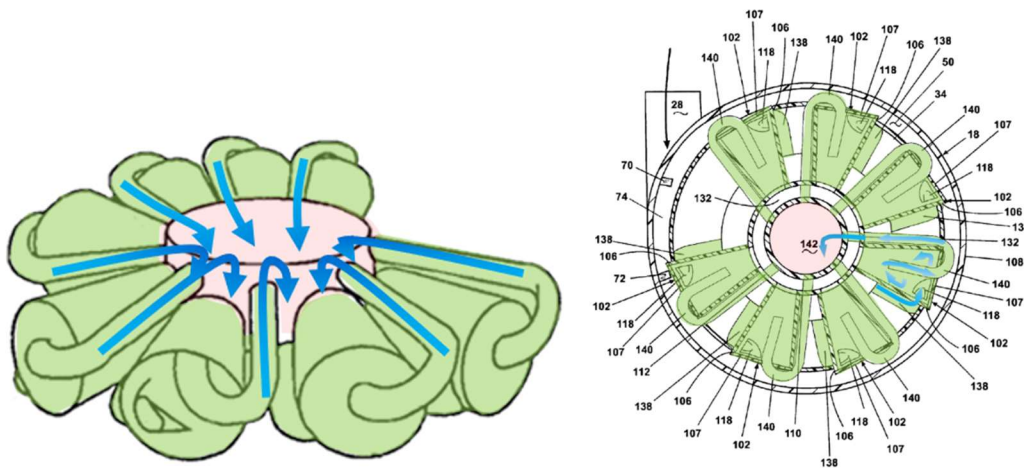
and “dirt cup/filter chamber 54”) that comprises a **central longitudinal axis** (“central vertical axis 104”). Ex1006, 5:6-55, 8:44-47; Ex1012, [0030]-[0032], [0039]-[0040], [0044]; Ex1002, ¶136.



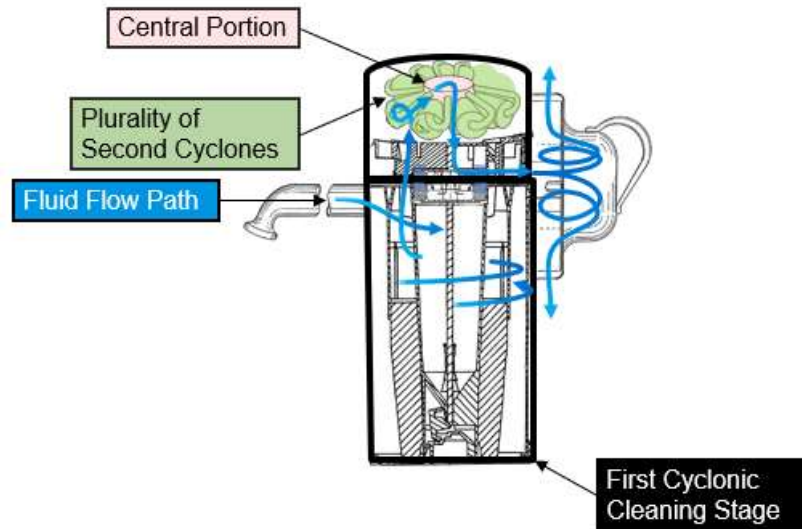
Ex1006, Figs.2, 4; Ex1012, Figs.4, 7, 9.

Fester256 teaches the “secondary cyclones 102 are arranged in parallel” and located about a “central vertical axis 104” which extends along upper standpipe 126. Ex1006, 5:8-11, 6:46-52, 7:9-13, 8:44-45; Ex1012, [0039], [0041]-[0042], [0044]; Ex1002, ¶137.

Fester256 further teaches that, after exiting the **second stage cyclones** (secondary cyclones 102), air enters an upper portion of the **central portion** (upper portion of the upper standpipe 126) and exits the **central portion** at a position below the upper portion where the air enters the **central portion**. Ex1002, ¶138.



The combination of Schmidt, Liddell, and Fester, which incorporates Fester's secondary cyclone and downstream airflow path, teaches this limitation for the same reasons. Ex1002, ¶140.

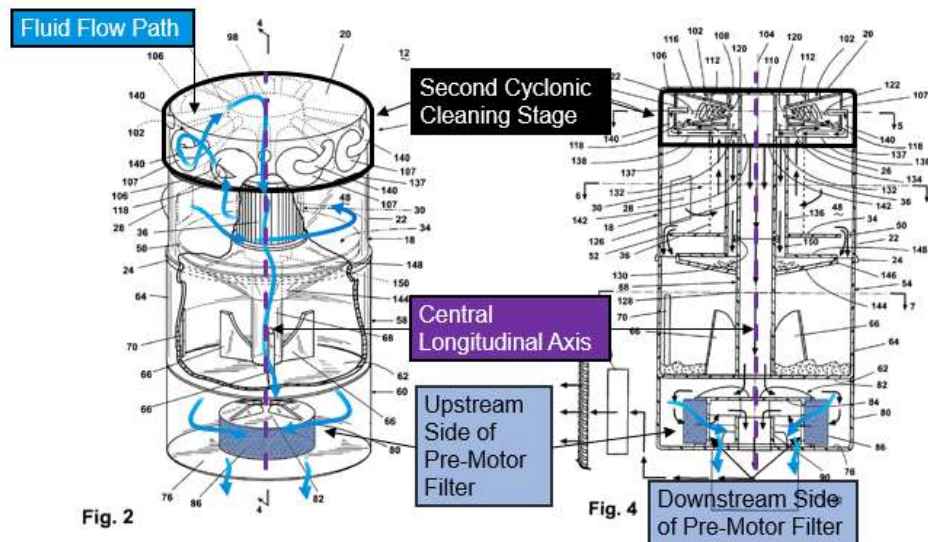


Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b.

A POSA would have understood that this combination of Schmidt, Liddell, and Fester²⁵⁶ teaches a second cyclonic cleaning stage positioned downstream in the fluid flow path from the first cyclonic cleaning that comprises a central longitudinal axis, where the second cyclonic cleaning stage comprises a plurality of cyclones in parallel arranged around a central portion where after air exits the second stage cyclones, the air enters an upper portion of the central portion and exits the central portion at a position below the upper portion where the air enters the central portion. Ex1002, ¶141.

e. 1[d]

Schmidt in combination with Liddell and Fester256 teaches this limitation. Ex1002, ¶142. Fester256 teaches a pre-motor filter (**filter assembly 82, including filter 86**) that is positioned downstream in the fluid flow path from the second cyclonic cleaning stage (**secondary cyclone assembly 100**) and comprises an upstream side and a downstream side wherein the central longitudinal axis (**central vertical axis 104**) extends through a volume occupied by the pre-motor filter.

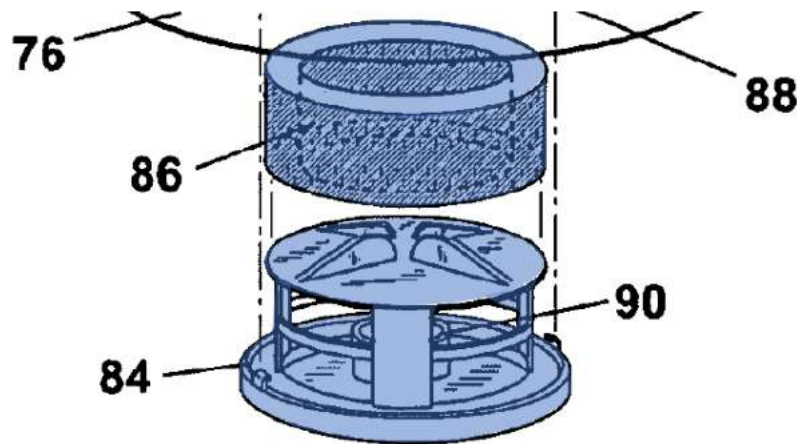


Ex1006, 3:28-32, 6:27-45, 8:60-67, Figs.2, 4; Ex1012, [0009], [0037], [0045],
Figs.2, 4, 7, 9; Ex1002, ¶143.

Fester256 teaches “[w]orking air passes through the working air outlet conduit 140” and “enters...the upper standpipe 126 where it is drawn...to the filter chamber region 60. The working air passe[s] though **filter 86** where particulate matter is captured and continues through the suction source inlet 90.” Ex1006, 8:60-65; Ex1012, [0045]; Ex1002, ¶144. Fester256’s Fig.4 shows air enters the **filter**

assembly 82, including **pre-motor filter 86**, from its exterior (*i.e.* upstream side) and exits in a downward direction through its interior (*i.e.* downstream side). Ex1006, Fig.4, 6:33-42; Ex1012, Figs.4, 9, [0037]; Ex1002, ¶144.

Fester256's Fig.4 shows **central vertical axis 104** goes through a volume occupied by **filter assembly 82**. Ex1006, Fig.4; Ex1012, Figs.4, 9; Ex1002, ¶145. To the extent PO argues **central vertical axis 104** does not pass through **filter 86** due to it being annular, Fester256 teaches **central vertical axis 104** passes directly through the top of the "**filter cage 84**" portion of **filter assembly 82**:

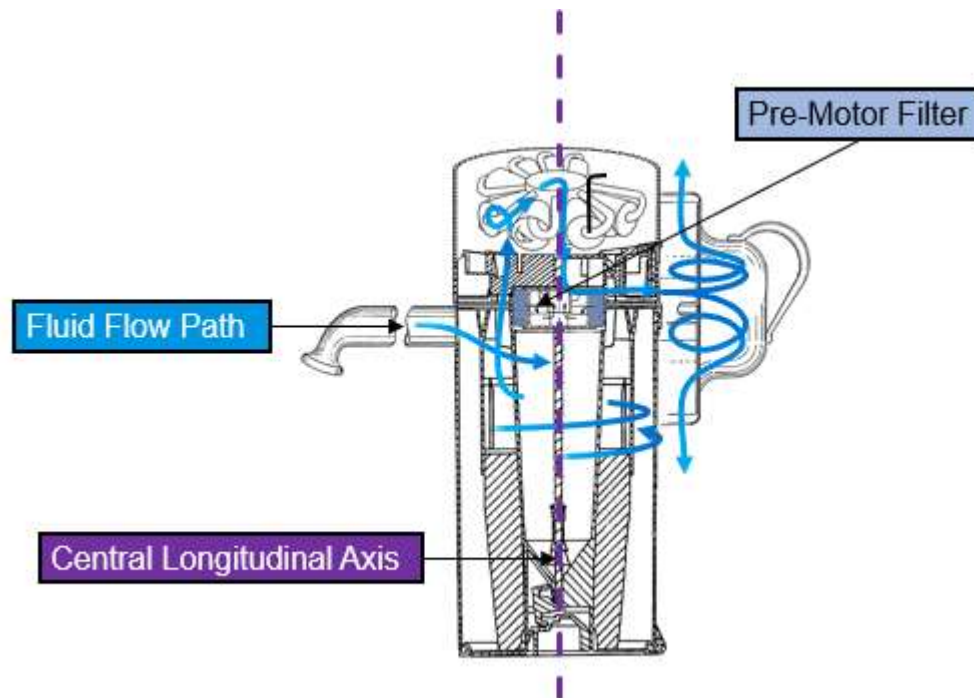


Ex1006, Fig.3(excerpted). 6:33-34; *see also* Figs.1-4; Ex1012, Figs.1-4, 7-9, [0037]; Ex1002, ¶145.

Like Fester256, the alleged central longitudinal axis of the accused Dyson V8 passes through a plastic frame of the V8's alleged pre-motor filter, rather than the semipermeable material through which the air passes. Ex1019, 10-13; Ex1002, ¶¶145-46. If the V8 meets this limitation, so does Fester256.

Further, Fester256 discloses that filter 86 could comprise a “flat foam filter” instead of the annular filter shown in Figure 4, such that filter 86 would not have a hole in its center. Ex1006, 6:42-43; Ex1012, [0037]; Ex1002, ¶147. In this “flat foam filter” implementation, **central vertical axis 104** passes through **pre-motor filter 86** material itself. *Id.*

The combination of Schmidt, Liddell, and Fester incorporates Fester256’s **filter assembly 82**, in either its annular or “flat foam” configuration, such that it is positioned in the fluid flow path downstream from the second cyclonic cleaning stage (Fester’s secondary cyclone assembly 100) and comprises an upstream side and a downstream side wherein the central longitudinal axis (Fester256’s **central vertical axis 104** or Liddell’s central **longitudinal axis 150**, which are coaxial) extends through a volume occupied by the pre-motor filter:



Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b; Ex1002, ¶148.

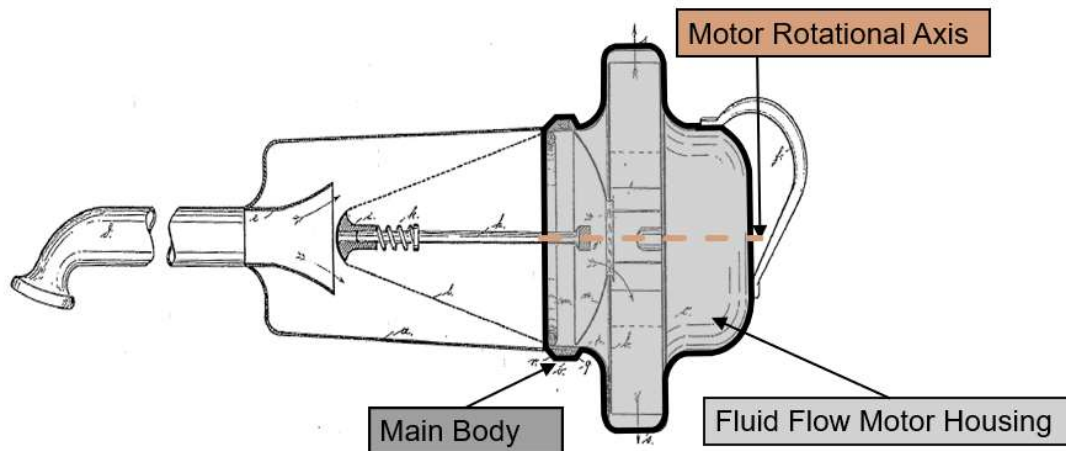
A POSA would have been motivated to position Fester256's **filter assembly 82** in Fester256's standpipe 126 in rotated orientation downstream from Fester's second cyclones 102 and upstream from Liddell's outlet port 126, which leads to Schmidt's motor, as previously explained. Ex1002, ¶149.

A POSA would have been motivated to route airflow so that air enters the top of **filter assembly 82** and exits the side by flipping **filter assembly 82** upside down so that air can efficiently travel through Liddell's outlet port 126 in a manner that avoided loss in flow or suction. Ex1002, ¶150. A POSA would have understood that this combination teaches this limitation. Ex1002, ¶151.

f. **1[e]**

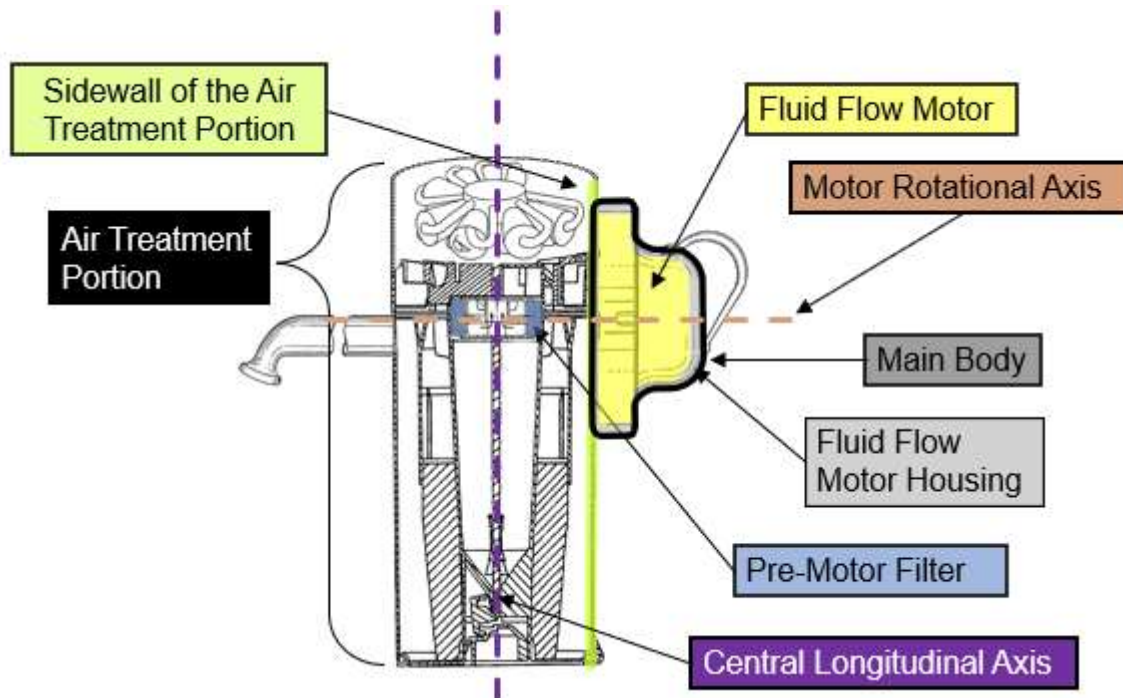
Schmidt in combination with Liddell and Fester256 teaches this limitation.

Ex1002, ¶152. Schmidt teaches the main body (fan housing and housing c) comprises a fluid flow motor housing (housing c) for a fluid flow motor, with a rotational axis, that is disposed in the fluid flow path where the “housing c encloses the motor, the shaft of which carries the turbine *b*”:



Ex1007, 1, 2, 3; Ex1002, ¶153.

A POSA would have understood that the motor and turbine rotate about this “axis,” defining a rotational axis, as shown above. Ex1002, ¶153. As such, the fluid flow motor is downstream of the pre-motor filter and a projection of the rotational axis of the fluid flow motor intersects the central longitudinal axis. Ex1002, ¶154. The housing c is then secured to only a portion of a sidewall of the air treatment portion:



Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b; Ex1002, ¶154.

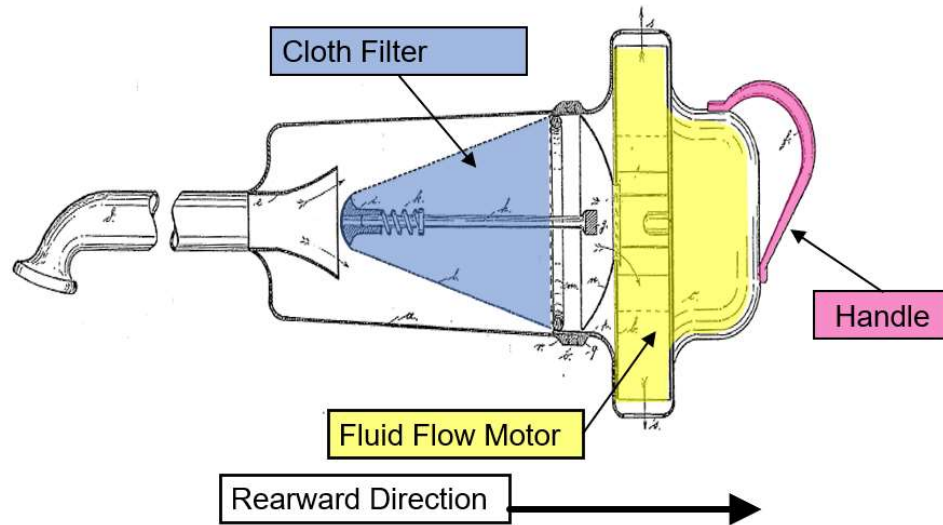
A POSA would have understood that this combination teaches this limitation.

Ex1002, ¶155.

g. 1[f]

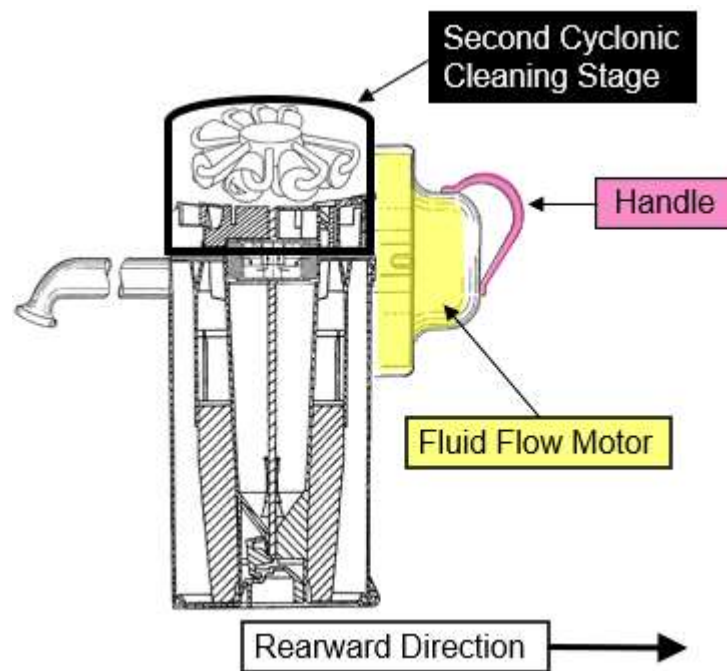
Schmidt in combination with Liddell and Fester256 teaches this limitation.

Ex1002, ¶156. Schmidt teaches a hand vacuum with a fluid flow motor and handle f that are positioned rearward of its dust separator:



Ex1007, 2, 3; Ex1002, ¶157.

Similarly, the combination teaches that the fluid flow motor (Schmidt's motor) and handle (Schmidt's handle f) are positioned rearward of the second cyclonic cleaning stage (Fester256's secondary cyclone assembly 100):

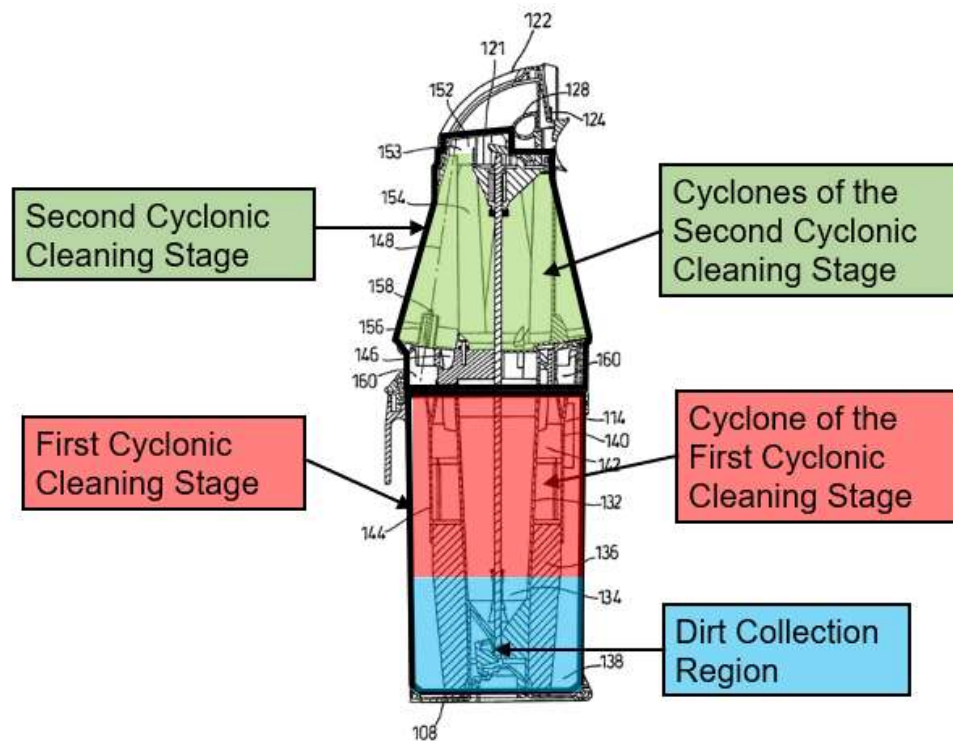


Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b; Ex1002, ¶158.

A POSA would have understood that this combination teaches this limitation.
Ex1002, ¶159.

h. **1[g]**

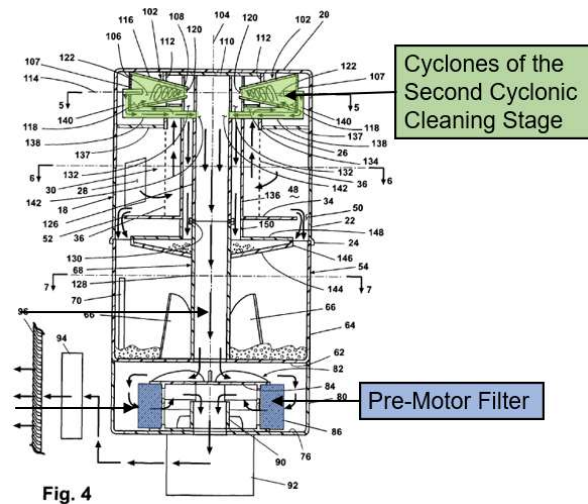
Schmidt in combination with Liddell and Fester256 teaches this limitation.
Ex1002, ¶160. Liddell teaches that the dirt collection region (collection spaces 134, 138) is positioned beneath and aligned vertically with the cyclones of the first and second cyclonic cleaning stages (upstream cyclone 102 and downstream cyclones 104, respectively):



Ex1005, Fig.3b, 6:5-10, 7:1-15; Ex1002, ¶161.

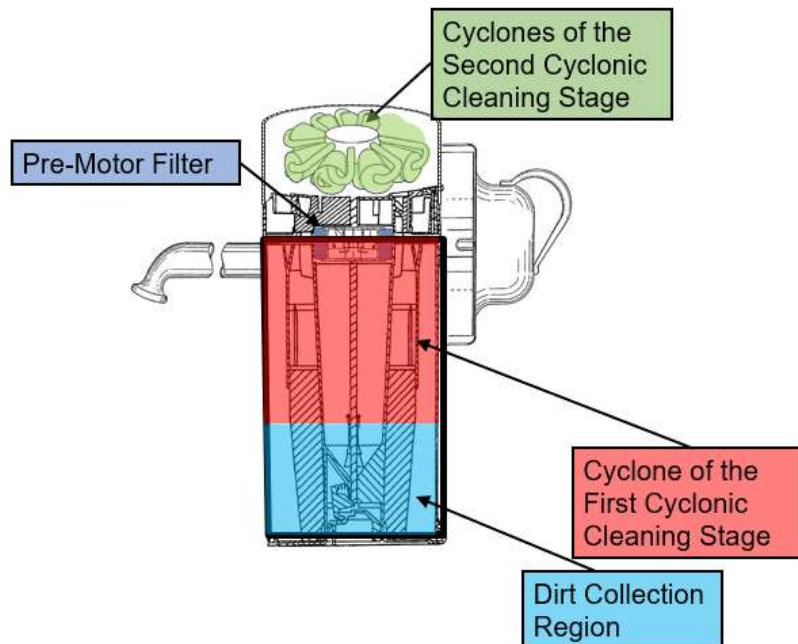
Fester256 teaches a **pre-motor filter** (filter assembly 82, of either an annular or disk shape) upstream from a suction source in the airflow path between **the**

cyclones of the second cyclonic cleaning stage and the suction source, such that the cyclones of the second cyclonic cleaning stage and pre-motor filter are centered on central vertical axis 104:



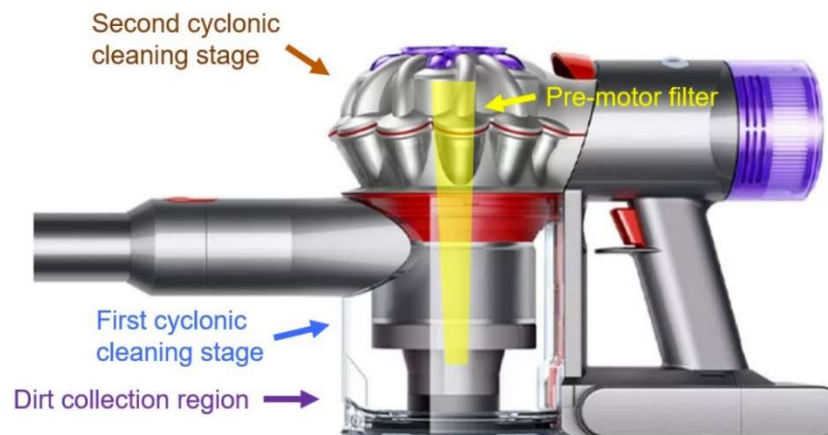
Ex1006, Fig.4, 5:6-21, 6:33-43; Ex1012, Figs.4, 9, [0037], [0039]; Ex1002, ¶162.

The combination teaches that the dirt collection region (Liddell's collection spaces 134, 138) is positioned beneath and vertically aligned with the cyclones of the first and second cyclonic cleaning stages (Liddell's upstream cyclone 102 and Fester256's secondary cyclones 102) and the pre-motor filter (Fester256's filter assembly 82):



Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b; Ex1002, ¶163.

PO contends the accused V8 vacuum meets this limitation even though the V8's alleged pre-motor filter is narrower than the alleged dirt collection region, which extends to the walls of the alleged first cyclonic cleaning stage:



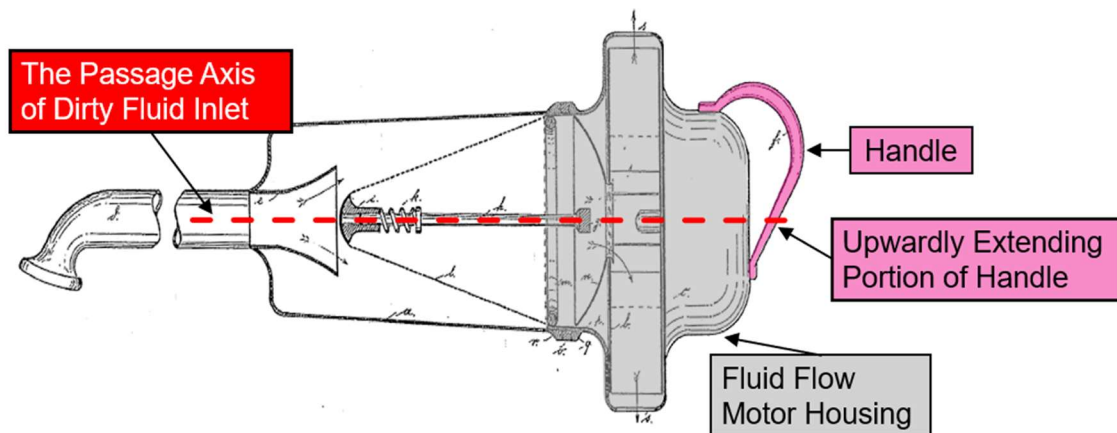
Ex1019, 19-21, 10-13; Ex1002, ¶165.

If the V8 meets this limitation, so does the combination here. Ex1002, ¶166.

Further, it also would have been obvious to a POSA to incorporate a larger pre-motor filter in the combination such that it overlies both of Liddell's collection spaces 134 and 138. Ex1002, ¶164. A POSA would have been motivated to use a filter with a large cross-sectional area to minimize the pressure drop across the filter and to reduce the frequency of filter maintenance and replacement and would have had a reasonable expectation of success. *Id.* A POSA would have understood that this combination would teach this limitation. Ex1002, ¶167.

i. **1[h]**

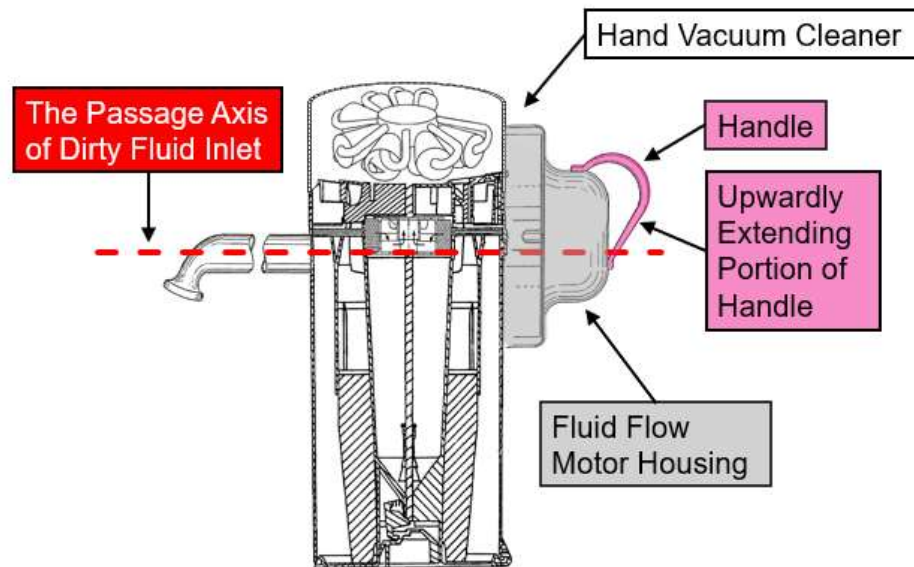
Schmidt in combination with Liddell and Fester256 teaches this limitation. Ex1002, ¶168. Schmidt teaches a handle (handle f) comprising an upwardly extending portion when the vacuum cleaner is placed on a horizontal surface:



Ex1007, 2, 3; Ex1002, ¶169.

A POSA would have understood that this combination teaches that a handle that comprises at least one upwardly extending portion when the hand vacuum cleaner is positioned on a horizontal surface, where the upwardly extending portion

extends away from the fluid flow motor housing (Schmidt's fan housing and housing c), and the passage axis of the dirty fluid inlet intersects the upwardly extending portion of the handle:



Ex1007, 2, 3(modified)⁷; Ex1006, Figs.3-4; Ex1005, Fig.3b; Ex1002, ¶170.

3. [2]

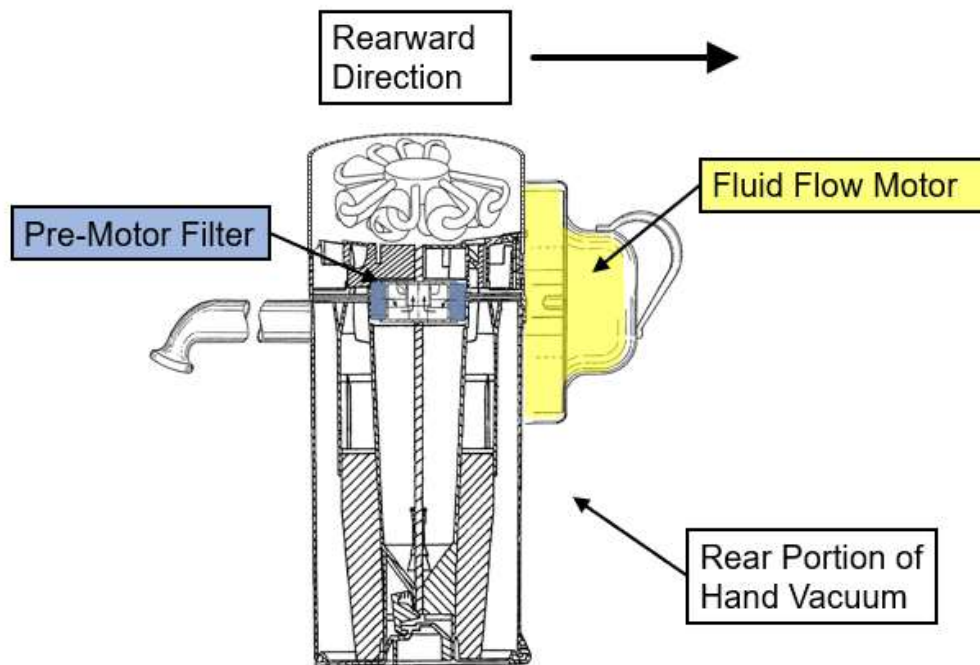
Schmidt in combination with Liddell and Fester²⁵⁶ teaches this claim and renders claim 1 obvious. Ex1002, ¶¶171-72. The combination teaches that the fluid flow motor (Schmidt's motor) is in a rear portion of the hand vacuum cleaner and

⁷ Claim 1 distinguishes between an “axis” and a “projection of” an axis.

'666Patent, Claim 1. PO contends the V8 meets this limitation. Ex1019, 21-23.

If the V8 meets this limitation, so does the combination here. Ex1002, ¶170.

the pre-motor filter (Fester256's filter assembly 82) is forward of the rear portion:



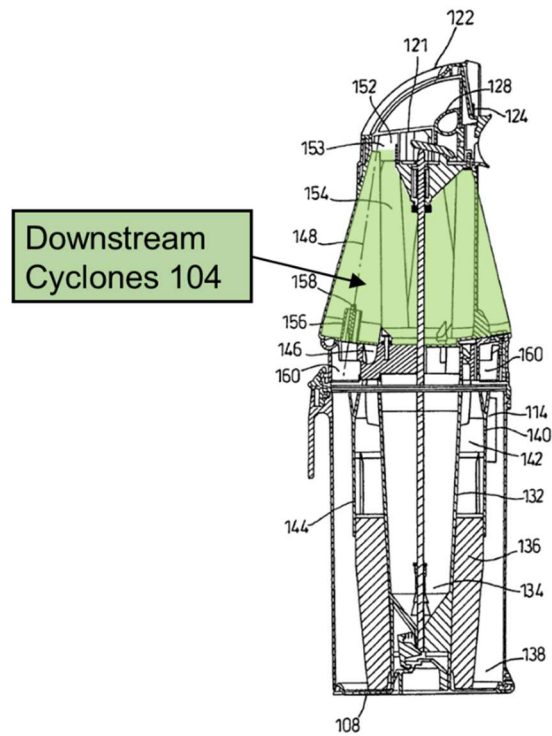
Ex1007, 2, 3(modified); Ex1006, Figs.3-4, 5:6-21, 6:33-43; Ex1012, Figs.4, 9, [0037], [0039]; Ex1005, Fig.3b; Ex1002, ¶173.

A POSA would have understood that this combination teaches this limitation.
Ex1002, ¶174.

4. [3]

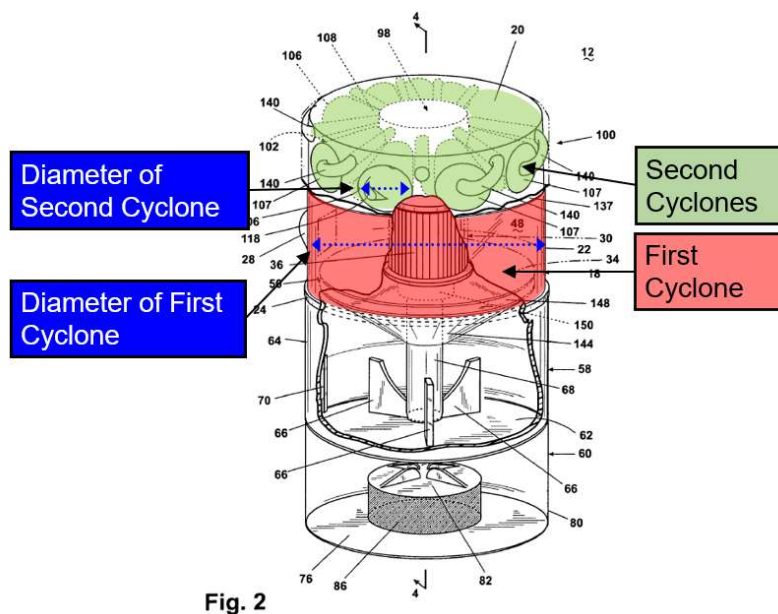
Schmidt in combination with Liddell and Fester256 teaches this claim and renders claim 1 obvious. Ex1002, ¶¶175-76.

Liddell teaches each of its downstream second cyclones 104 are smaller than its first upstream cyclone 102 because there is a plurality of second cyclones with a smaller diameter than the first cyclone's:



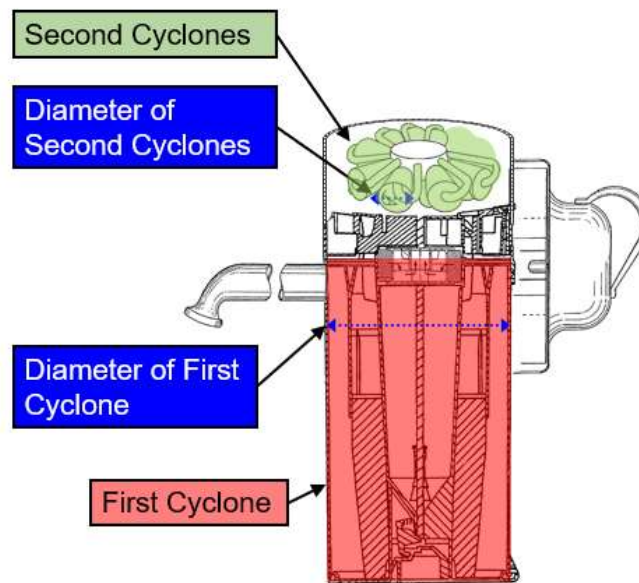
Ex1005, Fig.3b; Ex1002, ¶177.

Fester256 teaches each of the **second cyclones** (secondary cyclones 102) are smaller than the **first cyclone** (first cyclonic chamber 48):



Ex1006, Fig.2, 5:6-55, Fig.4; Ex1012, Figs.2, 4, 7, 9, [0030]-[0032], [0039]-[0040]; Ex1002, ¶178.

The combination of Schmidt, Liddell, and Fester likewise teaches that each of the second cyclones (Fester256's secondary cyclones 102) are smaller than the first cyclone (Liddell's upstream cyclone 102):



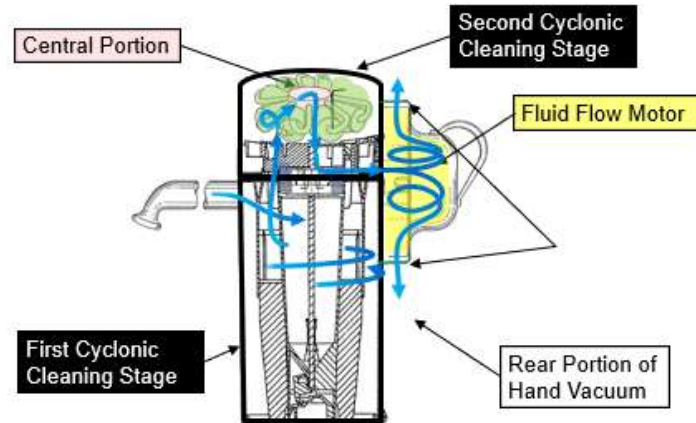
Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b; Ex1002, ¶179.

A POSA would have understood this combination teaches this limitation and renders claim 1 obvious. Ex1002, ¶180.

5. [4]

A POSA would have understood that Schmidt in combination with Liddell and Fester256 teaches this claim and renders claim 1 obvious. Ex1002, ¶¶181-83. The combination teaches that the fluid flow motor (Schmidt's motor) is rearward of the second cyclonic cleaning stage and air travels downwardly through the central

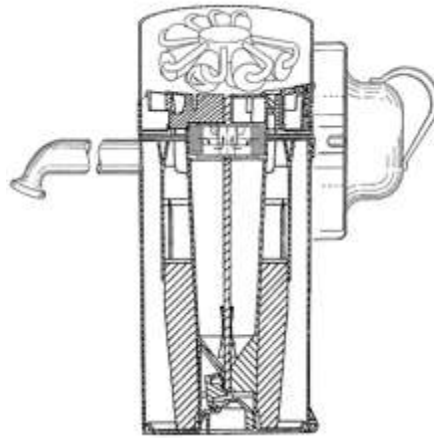
portion (Fester256's exhaust chamber 142 of the upper standpipe 126) before traveling rearwardly to the fluid flow motor:



Ex1007, 2, 3(modified); Ex1006, Figs.3-5, 5:6-31, 8:44-47; Ex1012, 4, 9-10, [0039]-[0040], [0044]; Ex1005, Fig.3b; §§VIII.A.1; §VIII.A.2.c-d; Ex1002, ¶184.

6. [5]

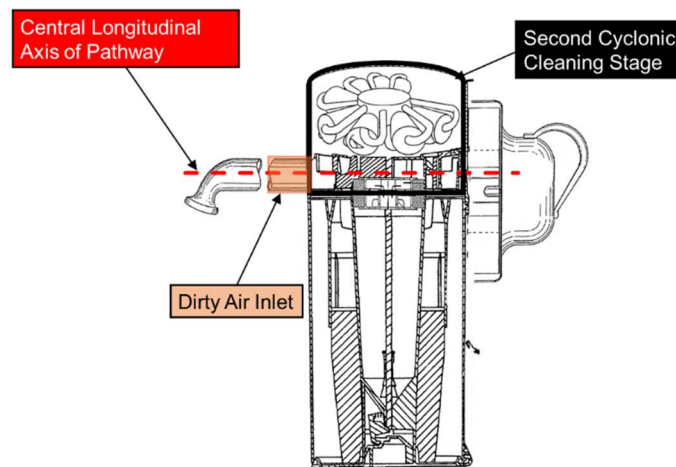
A POSA would have understood that Schmidt in combination with Liddell and Fester256 teaches this claim and renders claim 1 obvious. Ex1002, ¶¶186-87, 191. In the combination, Schmidt's suction pipe d enters Liddell's upstream cyclone unit 101 through inlet port 114. §VIII.A.1.b; Ex1002, ¶188. A POSA would have been motivated to further modify this design such that Schmidt's suction pipe d enters Liddell's upstream cyclone unit 101 from its open end through Liddell's inlet support member 112:



Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b; Ex1002, ¶188-89.

A POSA would have been motivated to make this change to simplify the process of “releasing the cylindrical bin 106 from the inlet support member 112 when the cylindrical bin 106 requires to be emptied,” so that bin 106 could be emptied without removing Schmidt’s suction pipe d from the rest of the vacuum. *Id.*; Ex1005, 5:31-6:2. This design also would have been obvious to try, since there are a limited number of locations to introduce air into the vacuum (at the first or second cyclonic cleaning stage) and a POSA would have had a reasonable expectation of success. Ex1002, ¶¶189-90.

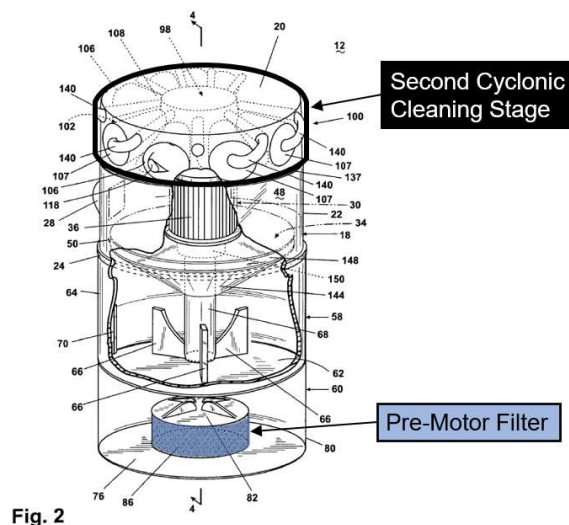
Thus, the combination renders obvious the dirty air inlet has a central longitudinal axis and a projection of the dirty air inlet central longitudinal axis intersects the second cyclonic cleaning stage:



Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b; Ex1002, ¶190.

7. [6]

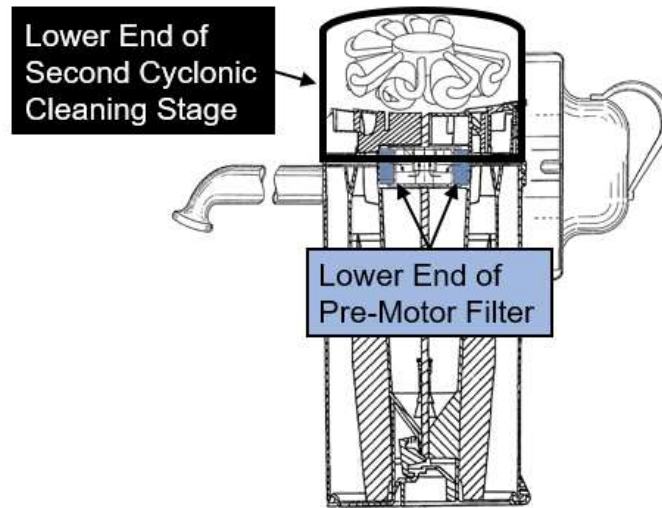
A POSA would have understood that Schmidt in combination with Liddell and Fester256 teaches this claim and renders claim 1 obvious. Ex1002, ¶¶192-93, 196. Fester256 teaches a pre-motor filter (filter assembly 82) positioned below a lower end of the second cyclonic cleaning stage (secondary cyclone assembly 100):



Ex1006, Fig.2; Ex1002, ¶194; *see also* Ex1006, Fig.4; Ex1012, Figs.2, 4, 7, 9.

The combination similarly teaches that the lower end of the pre-motor filter is

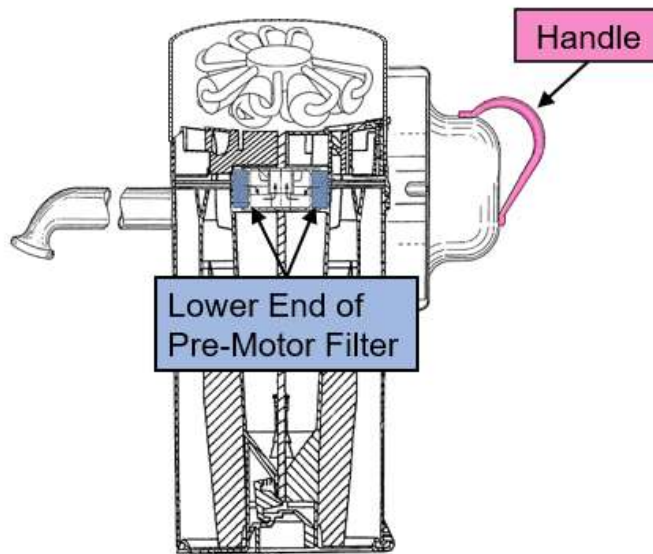
below the lower end of the secondary cyclonic cleaning stage:



Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b; Ex1002, ¶195.

8. [7]

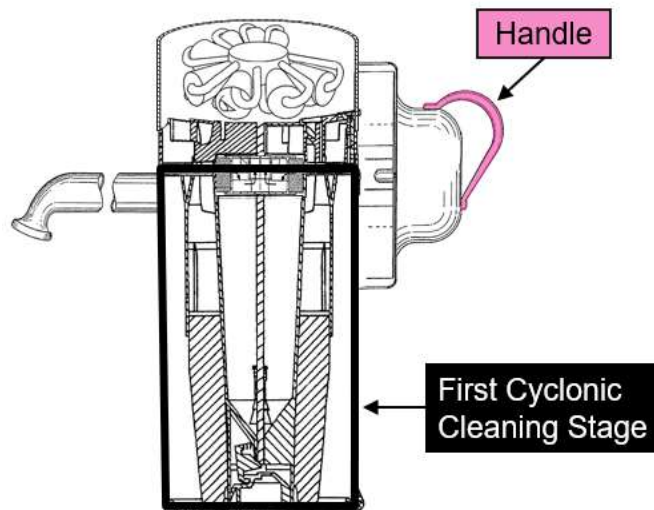
A POSA would have understood Schmidt in combination with Liddell and Fester256 teaches this claim and renders claim 1 obvious. Ex1002, ¶¶197-200. The combination teaches that a portion of Schmidt's handle f is positioned above a lower end of the pre-motor filter (Fester256's filter assembly 82):



Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b; §VIII.A.2.e, VIII.A.2.g; Ex1002, ¶199.

9. [8]

A POSA would have understood that Schmidt in combination with Liddell and Fester256 teaches this claim and renders claim 1 obvious. Ex1002, ¶¶201-07. The combination teaches that an end of the handle is mounted to the hand vacuum cleaner at a position adjacent an upper end of the first cyclonic cleaning stage:



Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b, 5:20-24; Ex1002, ¶203.

This handle is adjacent the upper end of the first cyclonic cleaning stage to the same extent as the embodiments in the '666Patent, which show handle 174 mounted to the vacuum at a location displaced from first cyclonic cleaning stage 116.

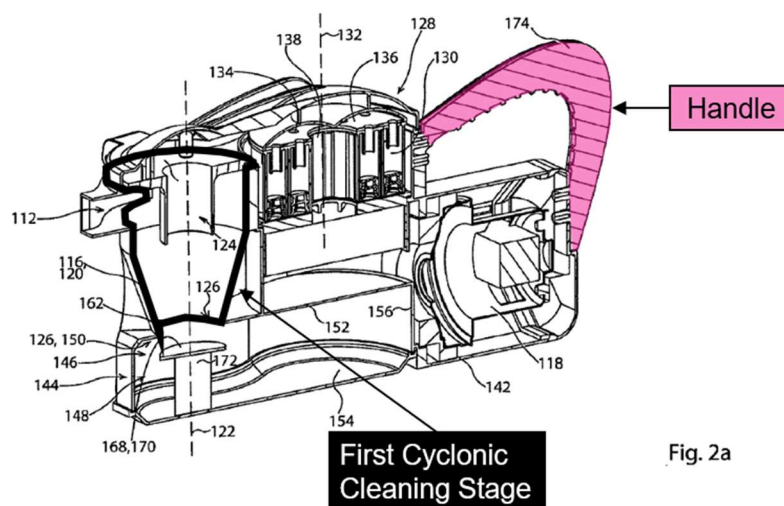
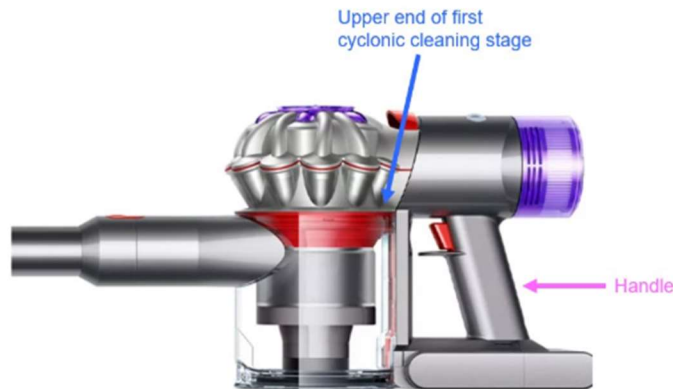


Fig. 2a

Ex1001, Fig.2a, 4:1-7, 7:32-34; Ex1002, ¶204.

The combination's handle is also adjacent the upper end of the first cyclonic

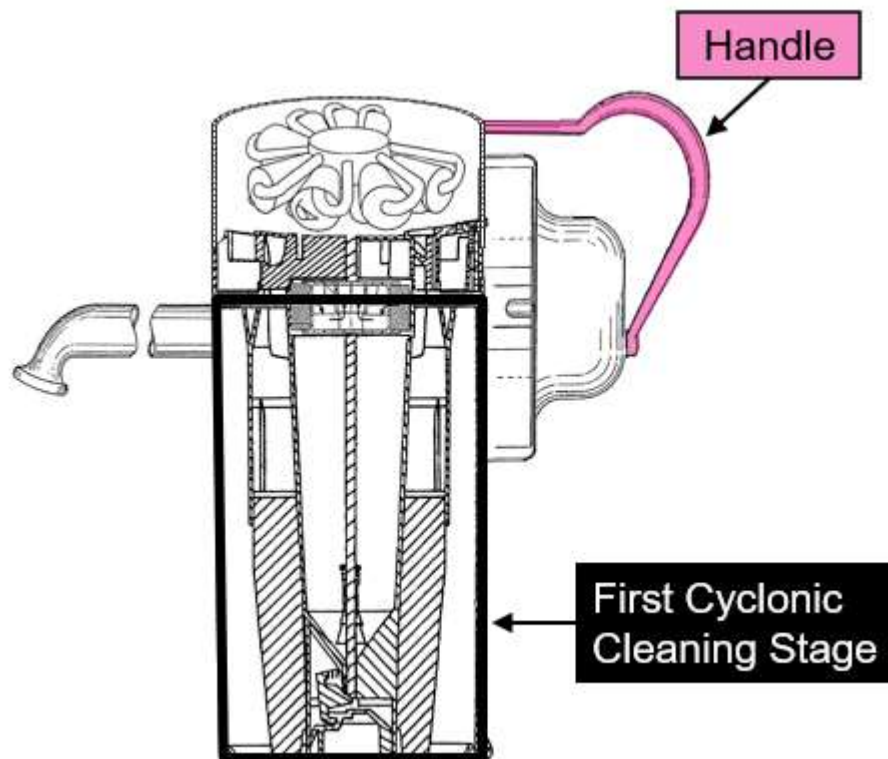
cleaning stage to the same extent as the accused V8 vacuum, in which the alleged handle is mounted on the vacuum at a location displaced from the alleged upper end of the alleged first cyclonic cleaning stage:



Ex1019, 30; Ex1002, ¶205.

To the extent Schmidt in combination with Liddell and Fester256 does not meet this limitation, it would have been obvious to a POSA to mount the handle at a position adjacent an upper end of the first cyclonic cleaning stage. Ex1002, ¶206. A POSA would have been motivated to mount the handle at different locations to improve the maneuverability, balance, and ergonomics of the vacuum. *Id.* For example, the prior art teaches to attach the handle near the center of gravity to allow the user to easily manipulate the vacuum with one hand. *See* Ex1011, 2:25-29; Ex1002, ¶206. Here, the center of gravity of the device would be near Schmidt's motor, such that mounting the handle close to the upper end of the first cyclonic cleaning stage would be balanced and easy to carry. *Id.* Further, a POSA would have recognized that, at a minimum, it was obvious to try because there were finite

number of identified, predictable ways to attach the handle on the vacuum, and a POSA would have had a reasonable expectation of success selecting a location adjacent the upper end of the first cyclonic cleaning stage. *Id.*

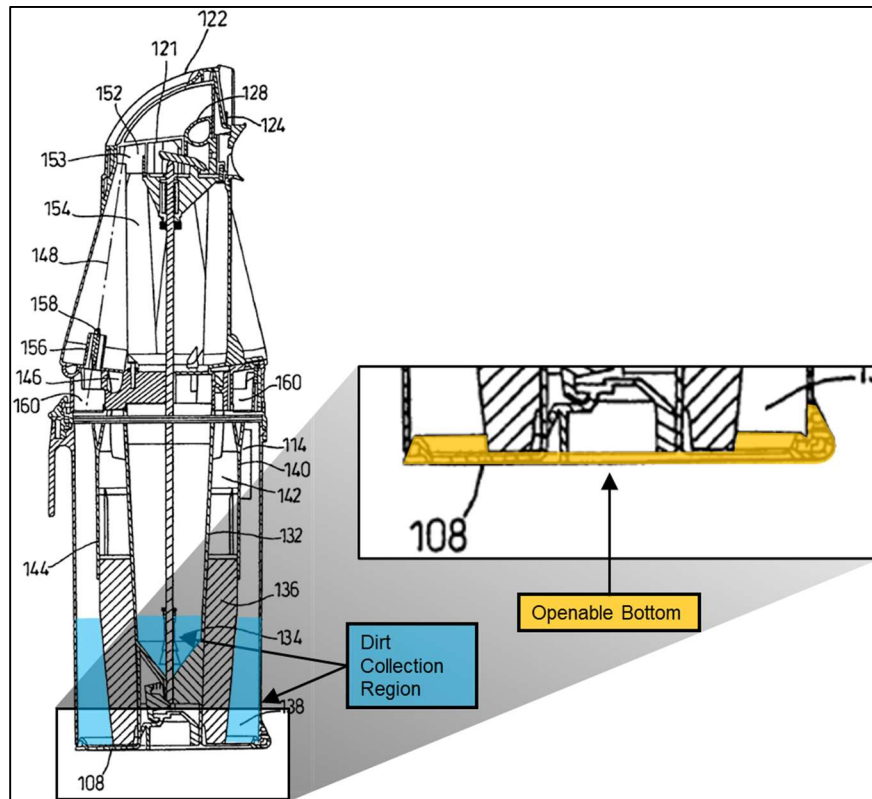


Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b.

10. [9]

A POSA would have understood that Schmidt in combination with Liddell and Fester256 teaches this claim and renders claim 1 obvious. Ex1002, ¶¶ 208-14. Liddell teaches a dirt collection region with a pivotally openable bottom and explains that “upstream cyclone 102 consists essentially of a cylindrical bin 106 having a closed base 108,” and that there is “an actuating lever 128 designed to activate a mechanism of opening the base 108 of the cylindrical bin 106 for emptying

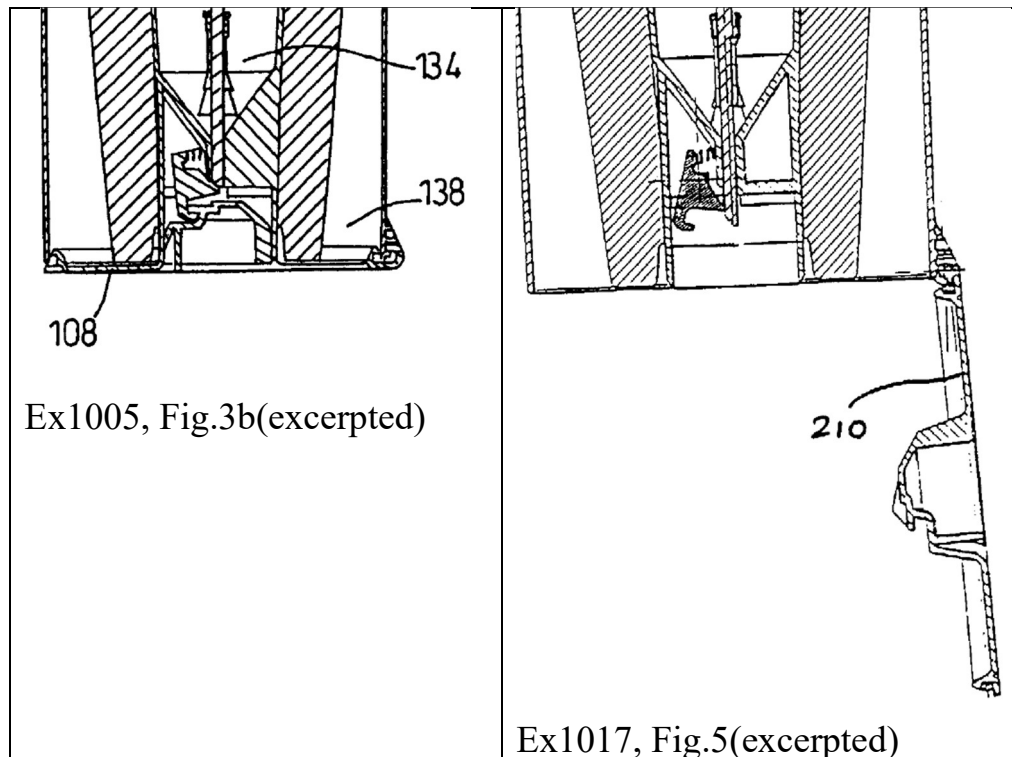
purposes”:



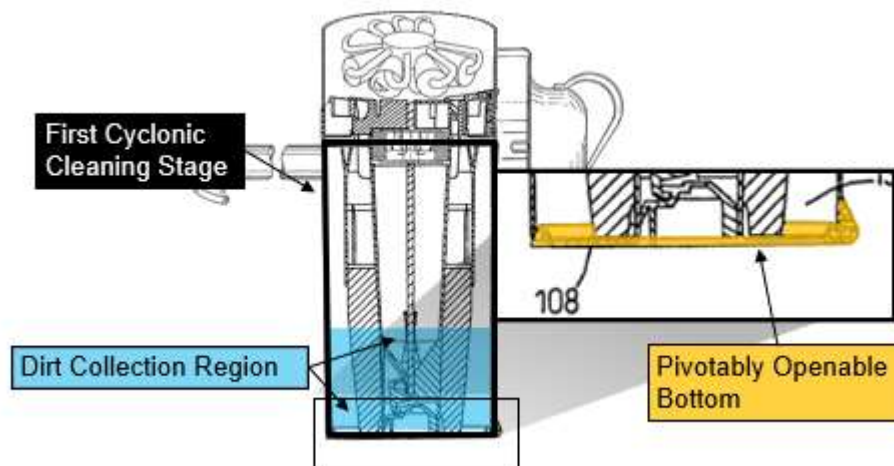
Ex1005, Fig.3b, 6:20-25; Ex1002, ¶210.

A POSA would have understood that base 108 is pivotally openable, including based on other prior art. Ex1002, ¶211. For example, Organ teaches a base with the same design as Liddell and teaches “base 210 is hinged 214 to the cyclone chamber 205 to allow pivotal movement.” Ex1017, 8:10-14; Ex1002, ¶212.

Liddell	Organ
---------	-------



The combination of Schmidt, Liddell, and Fester256 likewise teaches that the dirt collection region has a pivotably openable bottom:



Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b, 5:19-24; Ex1002, ¶213.

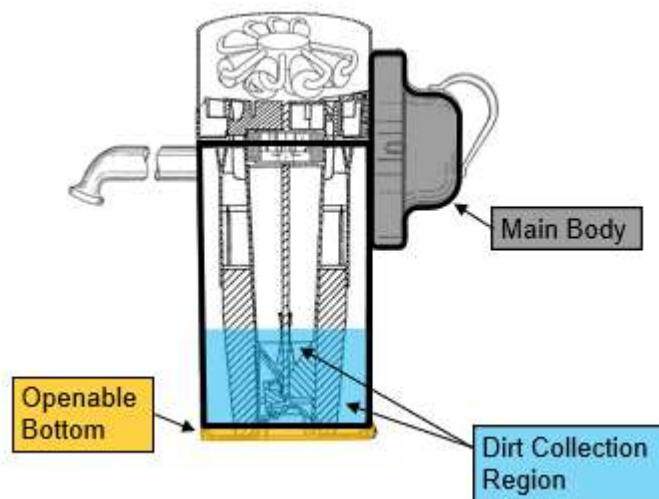
To the extent Liddell does not expressly state base 108 is pivotably openable, it would have been obvious to a POSA to make it pivotably openable. Ex1002, ¶212.

A POSA would have been motivated to make this change based on the teachings of Organ, which provides an eloquent solution for opening the base without detaching it. *Id.* At a minimum, it was obvious to try because there were finite number of identified, predictable ways to open the bottom, and a POSA would have had a reasonable expectation of success, including based on the teachings of Organ. *Id.*

11. [10]

A POSA would have understood that Schmidt in combination with Liddell and Fester256 teaches this claim and renders claim 1 obvious. Ex1002, ¶¶215-18. As discussed above, Liddell teaches or at least renders obvious a dirt collection region where the bottom is openable. *See* §VIII.A.10; Ex1002, ¶208-14.

The combination of Schmidt, Liddell, and Fester256 teaches that the dirt collection region is openable when the dirt collection region is attached to the main body:

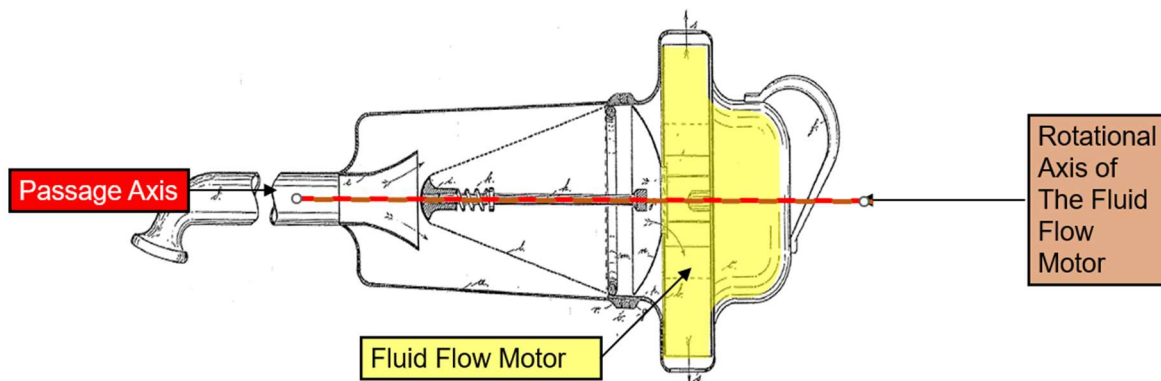


Ex1007, 3(modified); Ex1006, Figs.3-4; Ex.1005, 6:23-25; Ex1002, ¶¶217-18.

12. [11]

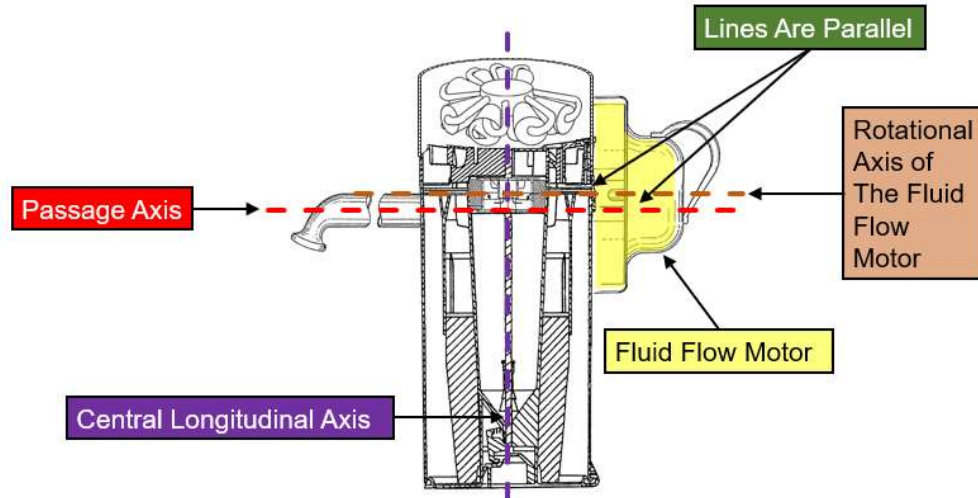
A POSA would have understood that Schmidt in combination with Liddell and Fester256 renders obvious this claim and renders claim 1 obvious. Ex1002, ¶¶219-24.

Schmidt's figures indicate that the rotational axis of the fluid flow motor is coaxial with the passage axis, which is preserved in the Schmidt, Liddell, and Fester256 combination:



Ex1007, 3; Ex1002, ¶221.

However, it would have been obvious to a POSA to offset these axes such that the rotational axis of the fluid flow motor is displaced from the passage axis in a direction parallel to the central longitudinal axis:



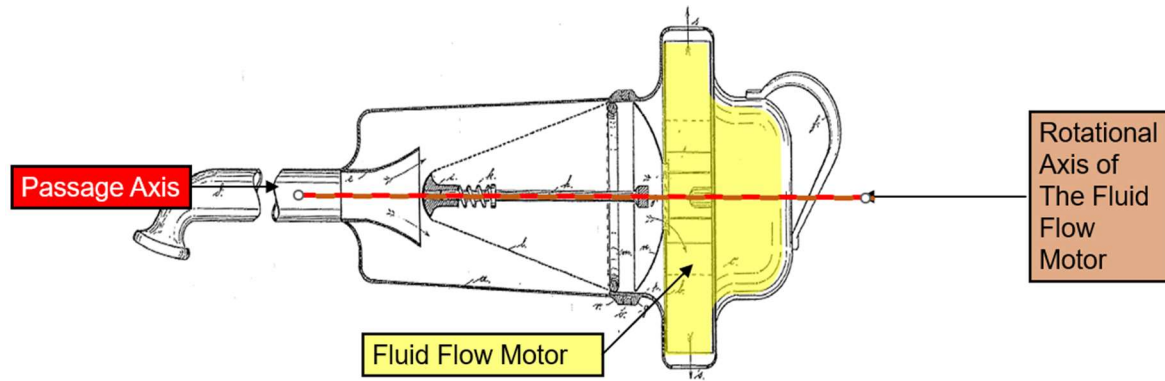
Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b; Ex1002, ¶222.

A POSA would have been motivated to move Schmidt's suction pipe d (and therefore the passage axis) close to the top of Liddell's cylindrical bin 106, to lower the likelihood that Liddell's inlet port 114 would clog with dust when the bin became full. Ex1002, ¶223. This modification (or even moving the dirty air inlet downward slightly) would have been obvious to try. *Id.* A POSA would have recognized there were a limited number of ways to arrange the dirty air inlet (including the passage axis) and the motor (including the rotational axis), and configurations in which the passage and rotational axes are offset from one another meets the claims. *Id.*

13. [12]

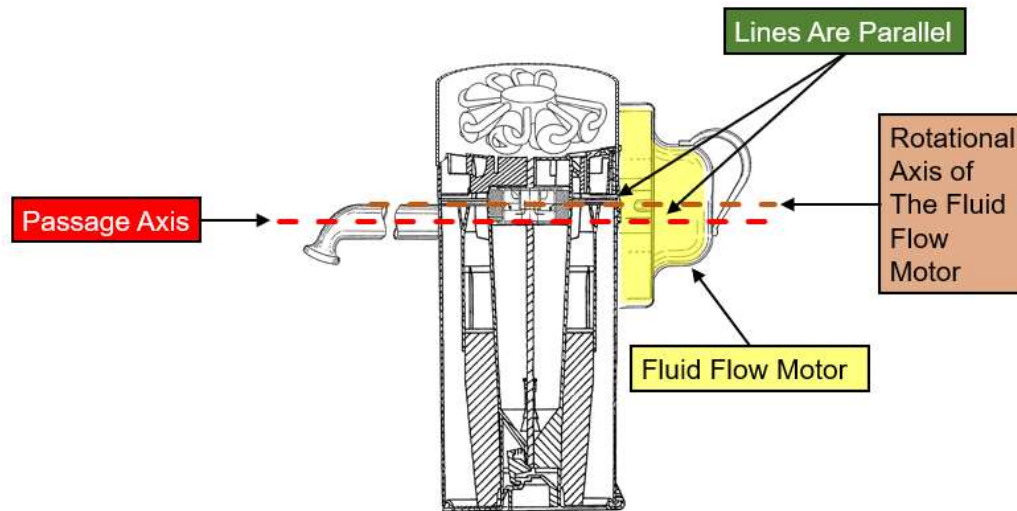
A POSA would have understood that Schmidt in combination with Liddell and Fester²⁵⁶ renders obvious this claim and renders claim 1 obvious. Ex1002, ¶¶225-29.

Schmidt teaches that the rotational axis of the fluid flow motor is parallel with the passage axis, which is preserved in the Schmidt, Liddell, and Fester256 combination.



Ex1007, 3; Ex1002, ¶227.

It would have been obvious to a POSA that the passage axis could be perpendicular to the height of the vacuum as this would maximize the cyclone's cyclonic effect. Ex1002, ¶228. This perpendicular axis to the vertical axis of Liddell could reduce the size of the vacuum and increase maneuverability and comfort given that the motor and blower of the vacuum rotate. *Id.* This arrangement comports with Schmidt's teachings that align the rotational axis parallel with the inlet passage axis. *Id.*



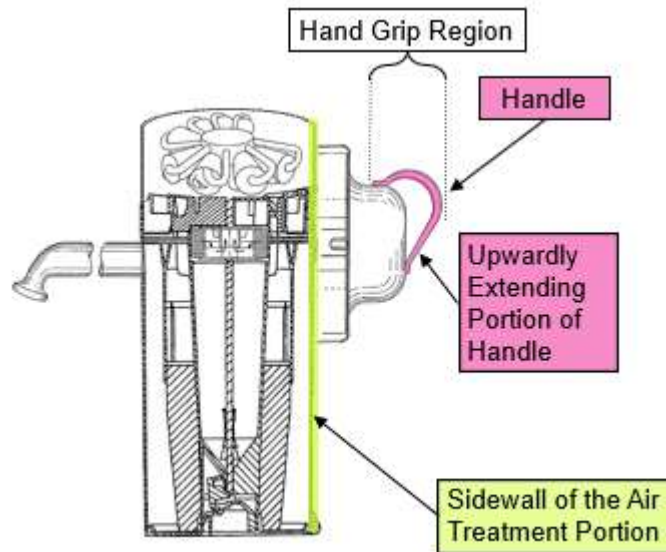
Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b.

Schmidt in combination with Liddell and Fester256 renders obvious this claim.

Ex1002, ¶ 22; §VIII.A.12.

14. [13]

A POSA would have understood that Schmidt in combination with Liddell and Fester256 teaches this limitation. Ex1002, ¶¶230-35. In the Litigation, PO contends “the ‘hand grip portion’ is simply the portion of the handle where a hand grips[.]” Ex1020, 13-14; Ex1002, ¶232. Under PO’s interpretation, the Schmidt, Liddell, and Fester256 combination teaches that a hand grip region is positioned between the upwardly extending portion of the handle and a portion of the sidewall of the air treatment portion:



Ex1007, 3(modified); Ex1006, Figs.3-4; Ex1005, Fig.3b; Ex1002, ¶232.

A POSA would have understood the portion of the handle between the upwardly extending portion and the sidewall is grasped by a user's hand at least some of the time. Ex1002, ¶233.

To the extent “hand grip portion” means a feature that assists with gripping, it would have been obvious to add a textured surface or grip to the interior of Schmidt's handle to make it easier to hold and manipulate during use. Ex1002, ¶234.

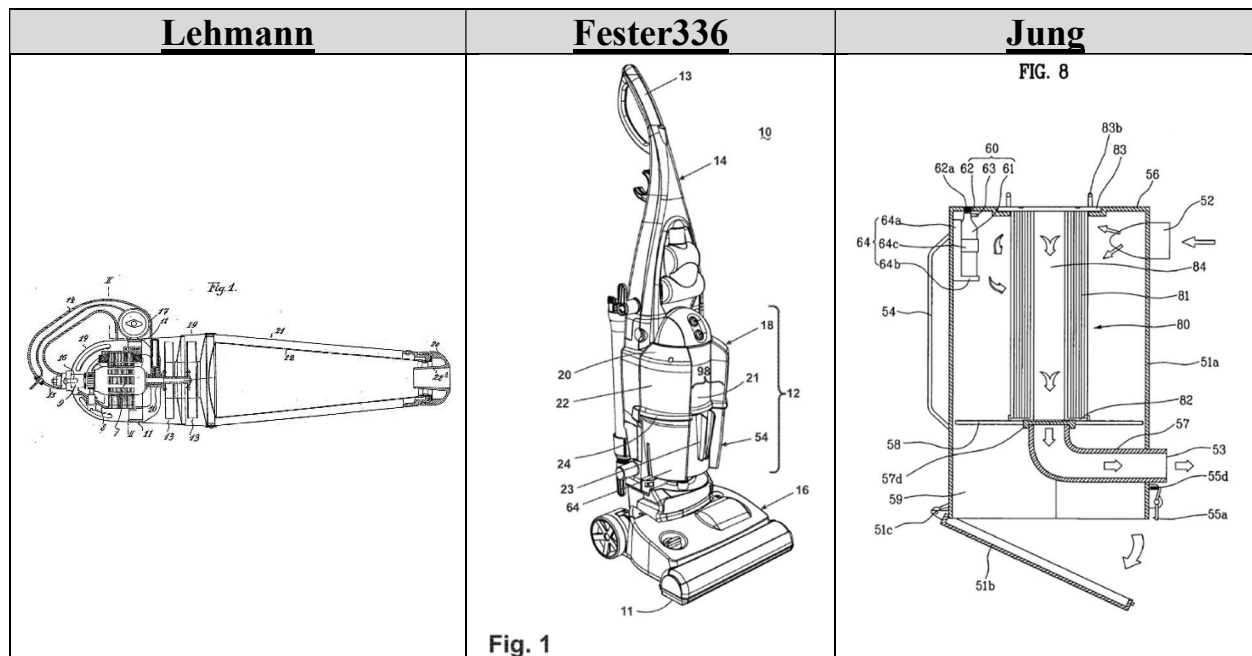
B. Ground 2: Lehmann In Combination With Fester336 and Jung

1. Motivations to Combine

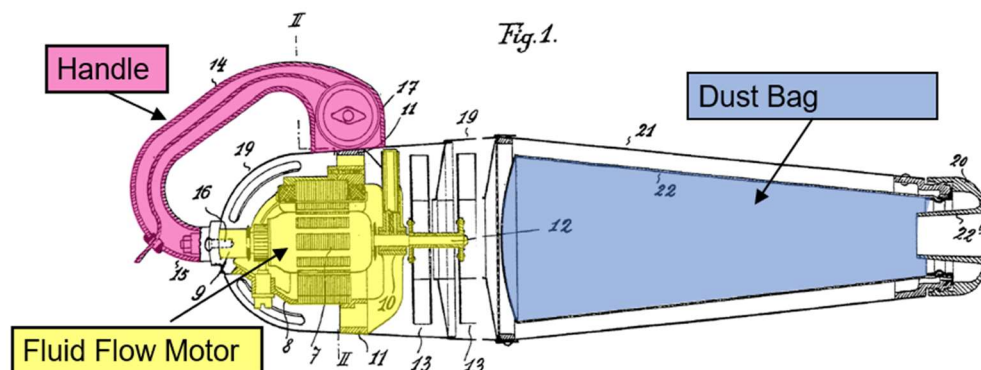
A POSA would have been motivated to combine Lehmann, Fester336, and Jung. Ex1002, ¶236.

Lehmann, Fester336, and Jung are analogous art because each is from the vacuum cleaner technological field. *See* Ex1011, 1:25-37; Ex1009, Abstract;

Ex1010, [Para 1]; Ex1008, Abstract. Ex1002, ¶237.

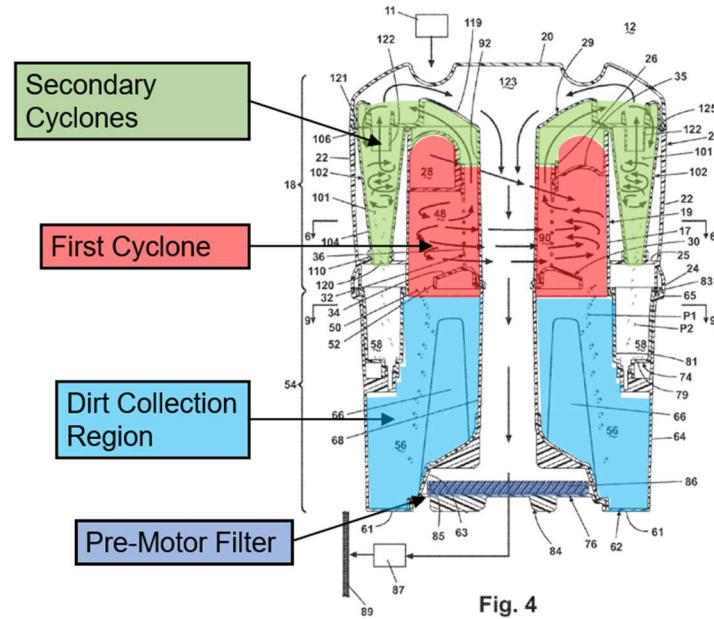


Lehmann teaches a handheld vacuum cleaner with a dust bag filter to separate dirt from air:



Ex1011, Fig.1; 1:63-82; Ex1002, ¶238.

Fester336 teaches a “cyclonic dirt separator and dirt cup assembly 12” “having a first cyclone and a plurality of downstream secondary cyclones” with a “dirt collection region” and pre-motor “filter assembly 76:”



Ex1009, Fig.4, Abstract, 4:20-25, 5:33-54; 8:13-14; Ex1010, Fig.4, [Para 1], [Para 20], [Para 24]; Ex1002, ¶239.

Fester336 teaches that air exits “**cyclonic dirt separator and dirt cup assembly 12**” vertically through **air duct 92** to a suction source in base housing 16:

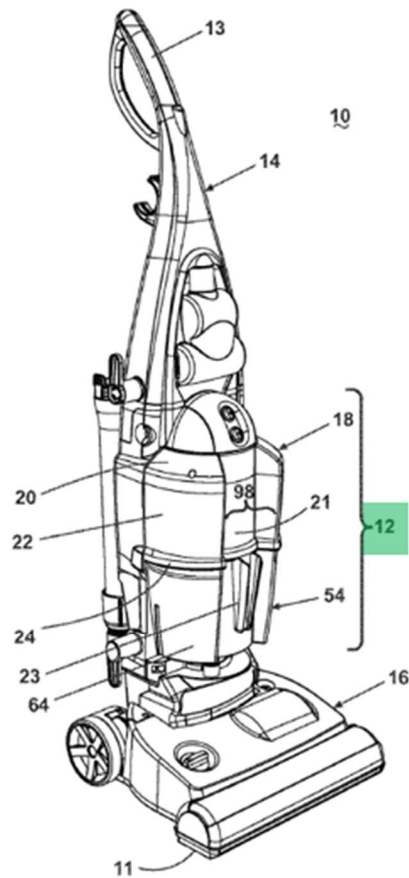


Fig. 1

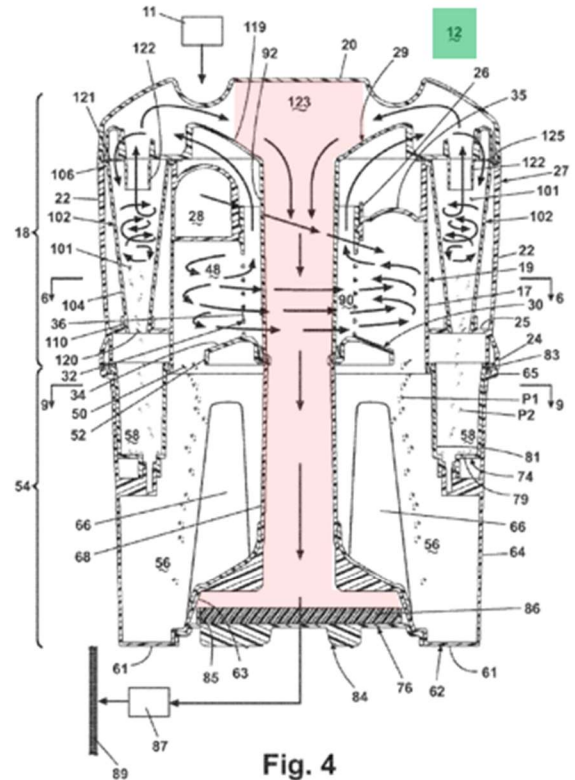
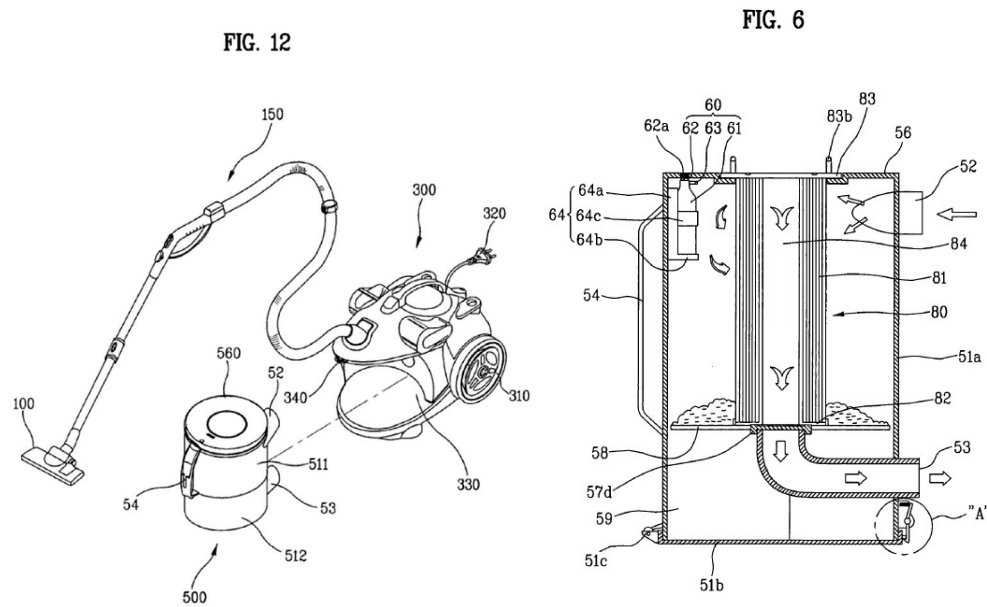


Fig. 4

Ex1009, Figs.1-4, 9:50-10:36; Ex1010, Figs.1-4, [Para 37]-[Para 38]; Ex1002,

¶240.

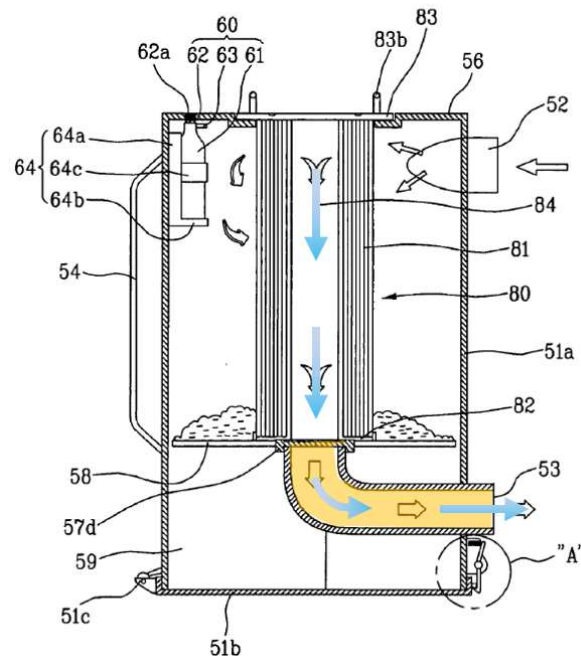
Jung teaches a cyclonic dust collecting assembly 50/500 for an upright or canister vacuum:



Ex1008, Figs.3, 12; Ex1002, ¶241.

Jung teaches cleaned air exits dust collecting assembly 50/500 through **inner flow tube 57**, which directs the airflow rearwardly toward ducting in the vacuum body:

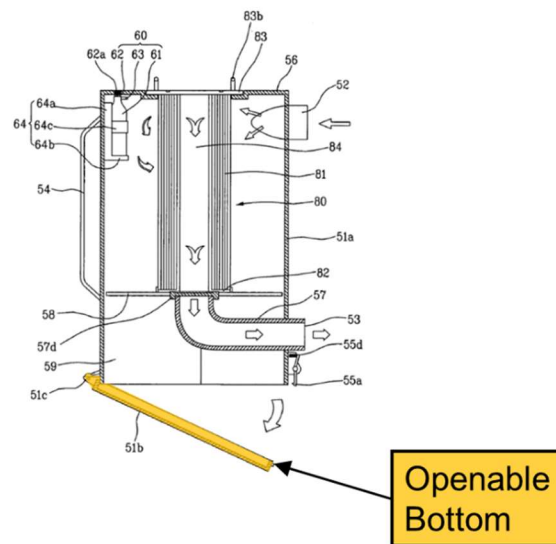
FIG. 6



Ex1008, Figs.3, 6, 12, [0097]-[0101], [0128]; Ex1002, ¶242.

Jung also teaches an openable bottom lid 51b to empty a dirt collection region:

FIG. 8



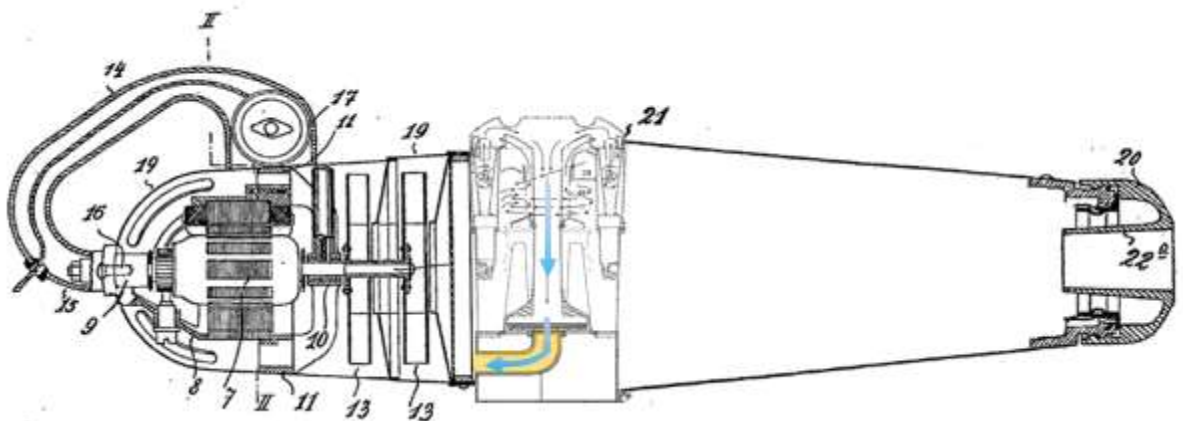
Ex1008, Figs.8, 11 [0114-15], [0139]; Ex1002, ¶243.

A POSA would have been motivated to replace Lehman's dust bag filter with Fester336's cyclonic filters because of cyclonic filtration's benefits. Ex1002, ¶244. Specifically, a POSA would have looked to Fester336 because it has two cyclonic cleaning stages, which more efficiently and effectively extracts debris from the air, and it has a pre-motor filter that further cleans the air before it passes through the fluid flow motor and is exhausted from the vacuum. *See infra* Section VIII.B.1.a; Ex1002, ¶244.

A POSA would have been motivated to modify Fester336's airflow path to preserve Lehmann's airflow path, with the airflow exiting rearwardly from the dust separator to Lehmann's main body. *See* §VIII.A.1.c; Ex1002, ¶245.

To modify Fester336's airflow path and dirt collection region, a POSA would have considered Jung because of their similarities, including that they both teach cyclonic air separators, and to add the benefits of Jung's hinged openable bottom. *See* §VIII.B.1.b; Ex1002, ¶246.

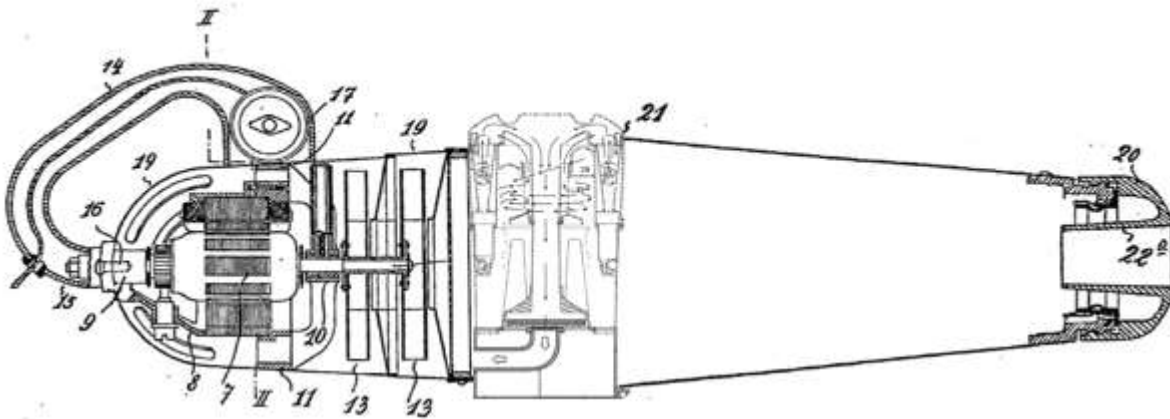
The resulting combination of Lehman, Fester336, and Jung is shown below:



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶247.

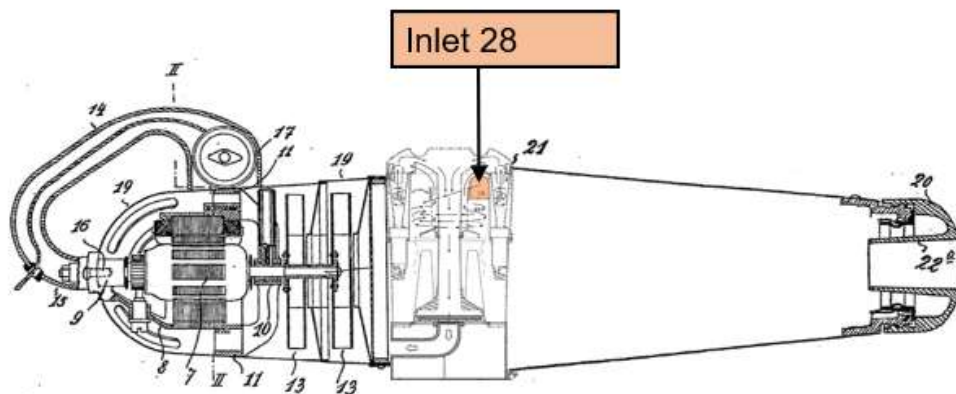
a. **A POSA Would Have Been Motivated to Substitute Lehmann's Filter with Fester336's System**

A POSA would have been motivated to substitute Lehmann's dust bag filter with Fester336's cyclonic separator, as shown below.



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶248.

A POSA would have understood that, with Lehmann's dust bag 22 removed, tapering part 21 would introduce air to Fester336's cyclonic separator 12 through inlet 28.



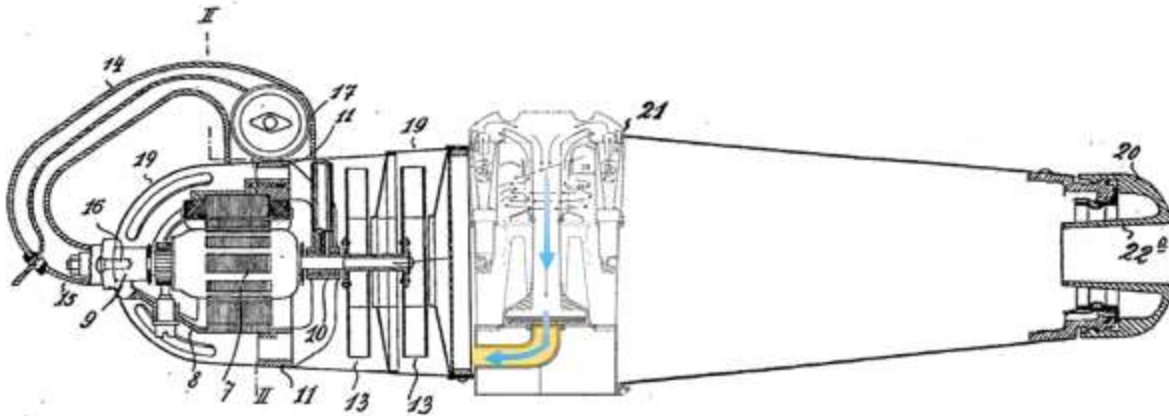
Ex1011, Fig.1(modified), 1:63-82, 2:7-24; Ex1002, ¶249; Ex1009, Fig.4, 5:23-6:10, 9:50-10:36; Ex1010, Fig.4, [Para 23]-[Para 26], [Para 37]-[Para 38]; Ex1008, Fig.6.

A POSA would have been motivated to make this combination for the same reasons a POSA would have been motivated to substitute Schmidt's cloth filter for Liddell's cyclonic separator: 1) because it would have been a simple substitution of one known filtration mechanism (a dust bag filter) with another (a cyclonic filter) to obtain a predictable result, and 2) to obtain the benefits of cyclonic separation. Ex1002, ¶250; *see* §VIII.A.1.a-b. Further, a POSA would have been motivated to maintain Fester336's vertical orientation in the combination with Lehmann for the same reason a POSA would be motivated to maintain Liddell's vertical orientation in the combination with Schmidt. *Id.* This combination would have been obvious to try for the same reasons. Ex1002, ¶251. Further, a POSA would have reasonably expected success for the same reasons described with respect to Schmidt and Liddell. Ex1002, ¶252.

b. A POSA Would Have Been Motivated to Modify Fester336's Air Treatment Portion With Jung's Rearward Air Routing and Openable Bottom

A POSA would have been further motivated to incorporate Jung's **inner flow tube 57** in the combination with Fester336 and Lehmann to direct the downward flow of air from Fester336's cyclonic separator rearwardly to Lehmann's motor and

maintain Lehmann's fluid flow path:

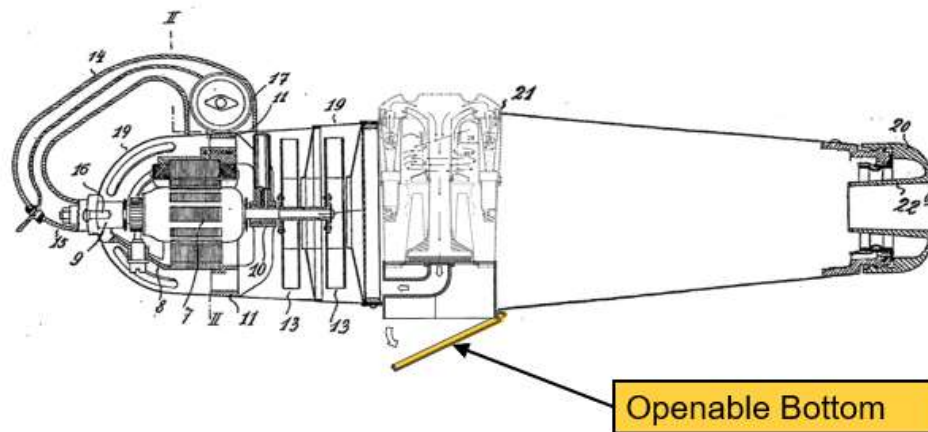


Ex1011, Fig.1(modified); 1:63-2:24; Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶253.

A POSA would have had a reasonable expectation of success implementing this modification because Jung uses **inner flow tube 57** in the same manner as the combination—to direct air flowing down a central duct rearwardly to the vacuum body. *See* Ex1008, Figs.3, 6, 12, Ex1002, ¶254. A POSA would have understood that when combined, Lehmann's electro motor 7 would pull air through Fester336's cyclonic separator and out the vacuum cleaner at a post-motor clean air outlet on Lehmann's casing 19. Ex1008, Fig.6, [0097]-[0101], [0128]; Ex1011, 1:63-82, Figs.1, 5; Ex1002, ¶255

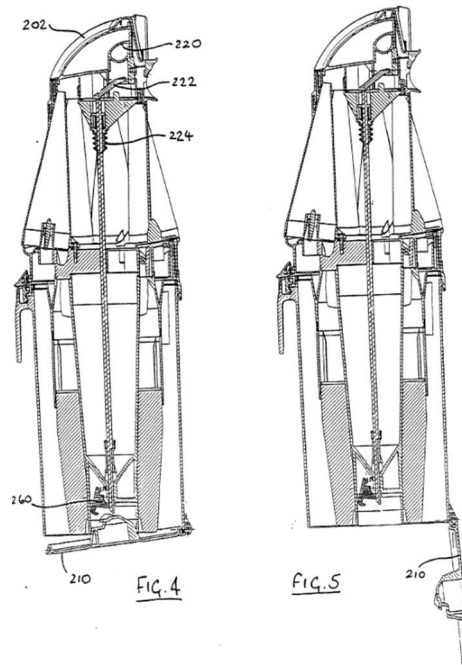
A POSA also would have been motivated to incorporate Jung's openable bottom lid 51b/512 in the combination with Lehmann and Fester336. Ex1002, ¶256. A POSA would have been motivated to modify Fester336's dust cup with Jung's openable bottom lid 51b/512 to more easily empty Fester336's dust cup. *Id.* Fester336 teaches that, "to discard accumulated dirt," the dirt cup assembly 54 is

“remove[d]...from the cyclone separator” and its contents are dumped out. Ex1009, Figs.1-4, 9:42-49; Ex1010, Figs.1-4, [Para 36]; Ex1002, ¶256. A POSA would have understood that Jung’s openable base would conveniently allow Fester336’s dust cup assembly 54 to be emptied before or after cyclone separator assembly 18 is removed from the vacuum body if the Fester336 dirt cup’s bottom is opened to allow debris to fall into Jung’s dirt cup; and that this would reduce the likelihood of spilling debris while carrying dust cup assembly 54 to the trash.



Ex1011, Fig.1(modified); Ex1008, Figs.6, 8; Ex1009, Fig.4; Ex1002, ¶256.

A POSA would have had a reasonable expectation of success making this modification because cyclonic separators with an openable bottom were well known prior to the '666Patent; for example, as shown by Organ:



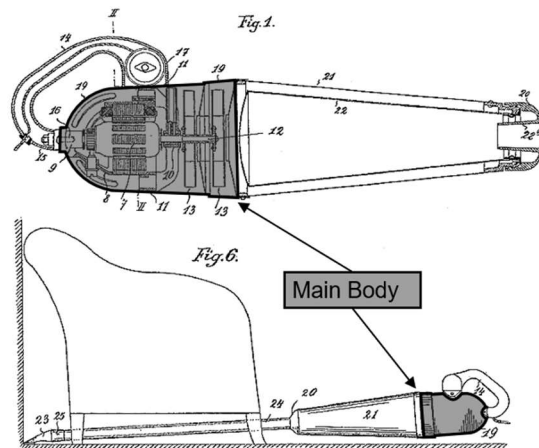
Ex1017, Figs.4-5; Ex1002, ¶257.

Further, a POSA would have had a reasonable expectation of success because Fester336 and Jung both teach that air cleaned by their respective cyclonic separators travels downward through a central channel before exiting the separator and Jung teaches an openable base compatible with that design. Ex1002, ¶258; Ex1008, Figs.6, 8, 10, [0087], [0097]-[0101], [0128]; Ex1009, Figs.1-4, 9:50-10:36; Ex1010, Figs.1-4, [Para 37]-[Para 38].

2. [1]

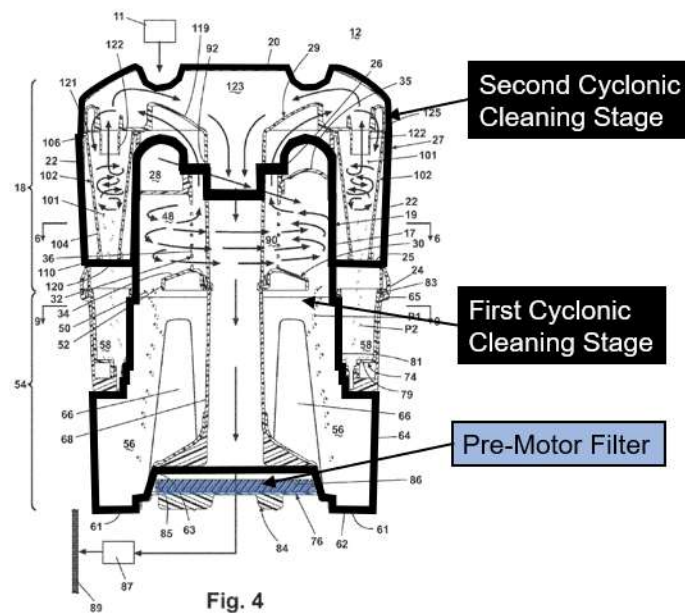
a. [1pre]

To the extent it is limiting, Lehmann in combination with Fester336 and Jung teaches and renders the preamble obvious. Ex1002, ¶¶259-64. Lehmann discloses a hand vacuum cleaner with a **main body** (“casing 19”):



Ex1011, Figs.1, 6, Claim 1, 1:78-91, 2:25-29; Ex1002, ¶260.

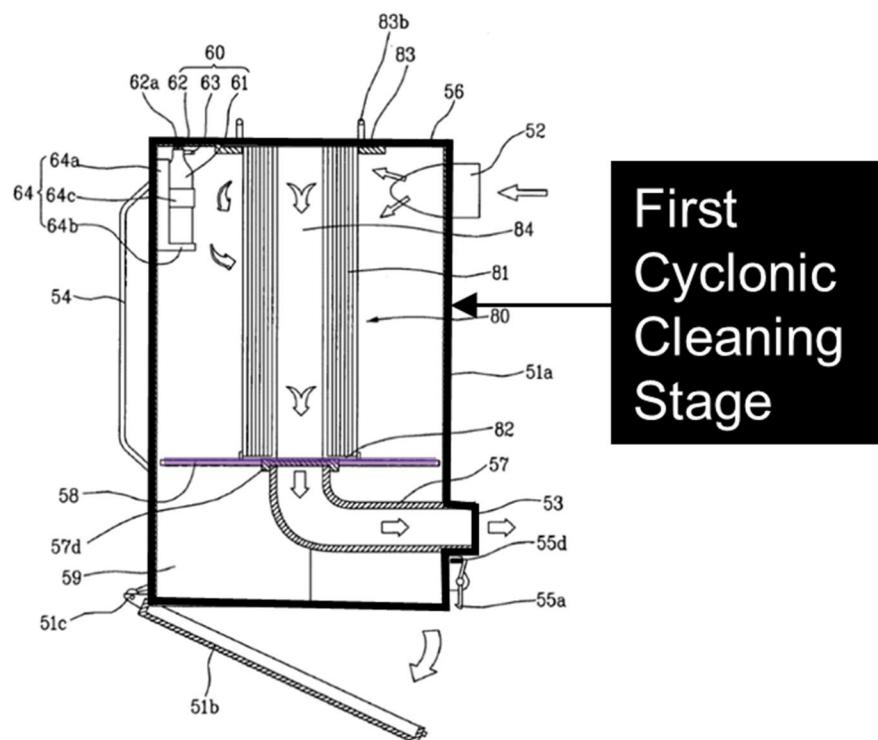
Fester336 teaches air treatment portion comprising a **first cyclonic cleaning stage** (“primary cyclonic toroidal chamber 48” and “dirt collection region 56”), a **second cyclonic cleaning stage** (“secondary cyclonic chamber 101”) and a **pre-motor filter** (“filter assembly 76”):



Ex1009, Fig.4, 5:33-53, 6:57-66, 9:17-31; Ex1010, Fig.4, [Para 24], [Para 27], [Para 35]; Ex1002, ¶261.

Jung also teaches an air treatment portion comprising a **first cyclonic cleaning stage**: “dust collecting space” of container 51/511, which has an “upper space” above separation plate 58/580 for cleaning air according to the “cyclone principle”, and a “lower space” below separation plate 58/580 for collecting debris:

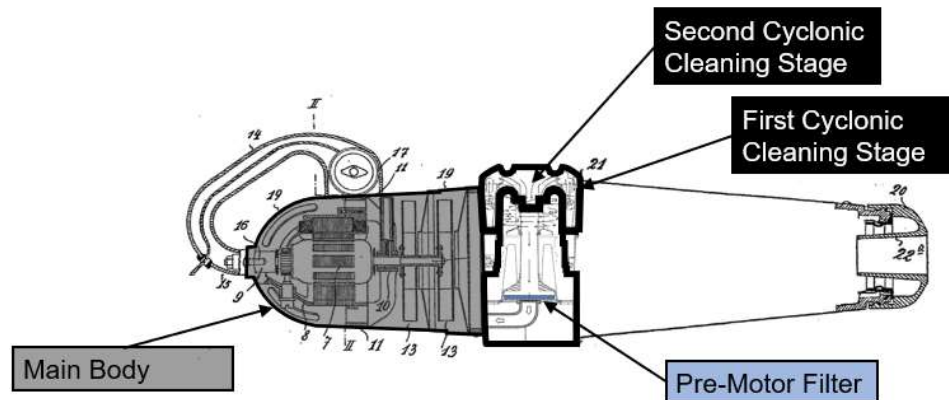
FIG. 8



Ex1008, Figs.8; Ex1002, ¶262.

A POSA would have understood that the Lehmann, Fester336, Jung combination likewise includes a handheld vacuum with an air treatment portion and a **main body** (Lehmann’s “casing 19”) where the air treatment portion includes **first**

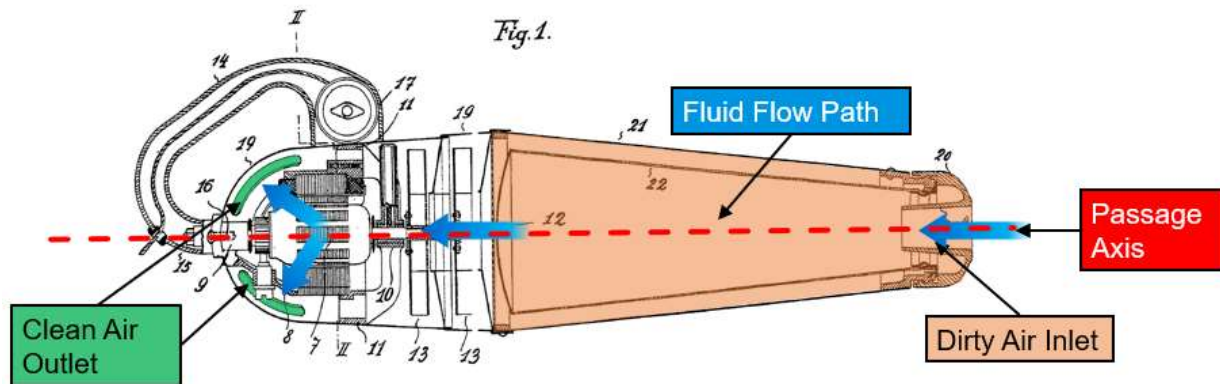
cyclonic cleaning stage (Fester336’s “primary cyclonic toroidal chamber 48” and “dirt collection region 56” and Jung’s “lower space” below separation plate 58/580), a **second cyclonic cleaning stage** (Fester336’s “secondary cyclonic chamber 101”), and a **pre-motor filter** (Fester336’s “filter assembly 76”):



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶263.

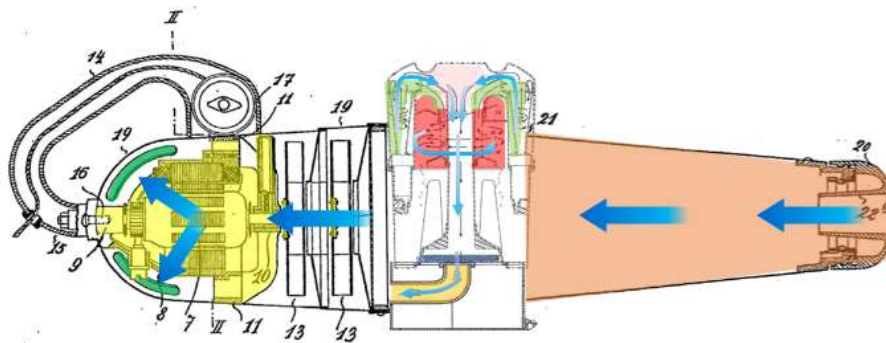
b. [1a]

A POSA would have understood that Lehmann in combination with Fester336 and Jung teaches this limitation. Ex1002, ¶¶265-69. Lehmann teaches a fluid flow path extending from a **dirty air inlet** (“inwardly directed coned socket 22a” and “tapering part 21”) to a **clean air outlet** (shown below) and the **dirty air inlet** defines a passage extending along a **passage axis**:



Ex1011, Fig.1, 1:63-82, 2:7-24; Ex1002, ¶266.

A POSA would have understood that the Lehmann, Fester336, Jung combination also includes a fluid flow path extending from a **dirty air inlet** (“inwardly directed coned socket 22a” and “tapering part 21”) to a clean air outlet and the **dirty air inlet** defines a passage extending along a **passage axis**:



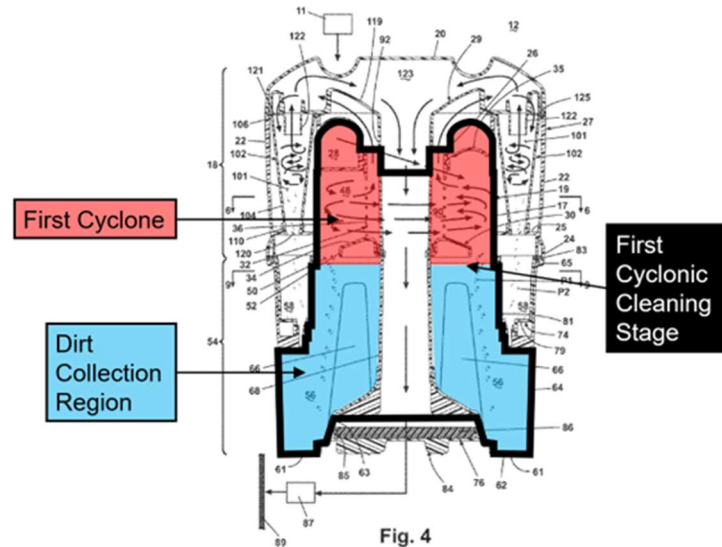
Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶267.

In the combination, a POSA would have understood that air enters the vacuum through Lehmann’s ubiquitous cleaning accoutrements that are attached to **inwardly directed coned socket 22a** and **tapering part 21**, and enters Fester336’s **primary cyclonic toroidal chamber 48** through inlet 28. Ex1002, ¶268; Ex1011, Fig.1, 1:63-

82, 2:7-24; Ex1009, Fig.4, 5:23-6:10, 9:50-10:36; Ex1010, Fig.4, [Para 23]-[Para 26], [Para 37]-[Para 38]. POSAs would have understood air then passes through Fester336's **secondary cyclones 102**, through **air duct 92**, and through **filter assembly 76**, after which it passes through Jung's **inner flow tube 57**. Ex1002, ¶268; Ex1009, Fig.4, 5:23-6:10, 9:50-10:36; Ex1010, Fig.4, [Para 23]-[Para 26], [Para 37]-[Para 38]. Furthermore, POSAs would have understood air exiting Jung's **inner flow tube 57** then passes through Lehmann's **fan 13 and electro motor 7** and out of the vacuum cleaner at a **post-motor clean air outlet**. Ex1008, Fig.6, [0097]-[0101], [0128]; Ex1011, 1:63-82, Figs.1, 5; Ex1002, ¶268.

c. [1b]

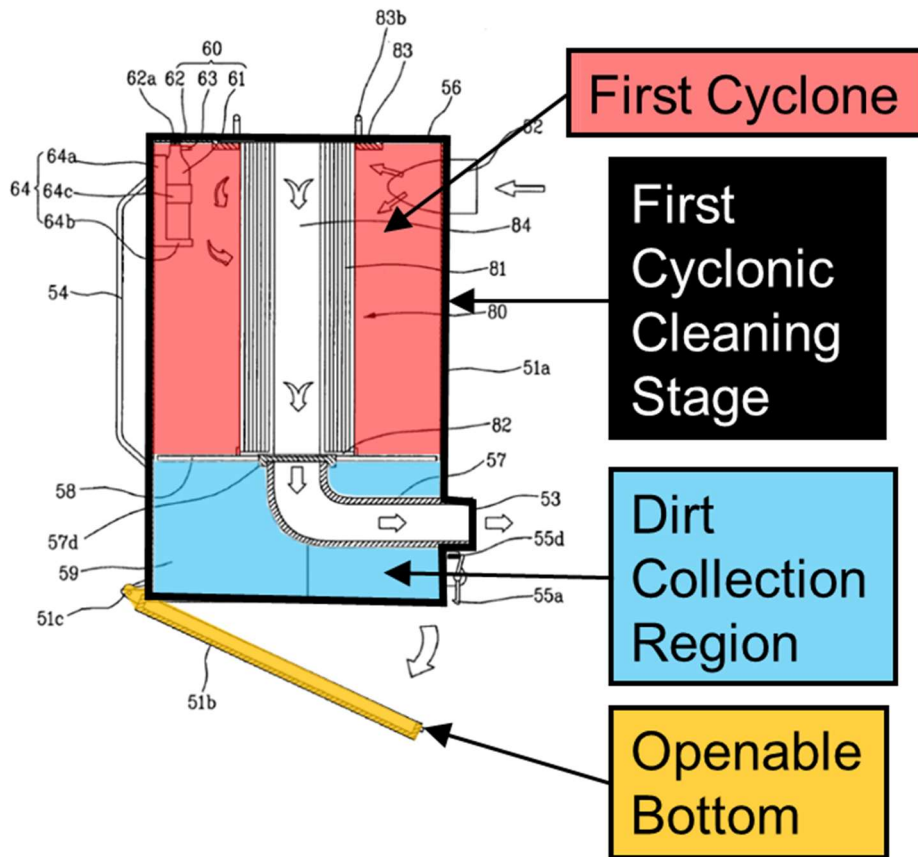
A POSA would have understood that Lehmann in combination with Fester336 and Jung teaches this limitation. Ex1002, ¶¶270-75. Fester336 teaches the **first cyclonic cleaning stage** (“primary cyclonic toroidal chamber 48” and “dirt collection region 56”) is positioned in the fluid flow path and comprises a **first cyclone** (“primary cyclonic toroidal chamber 48”), having a **dirt collection region** (“dirt collection region 56”):



Ex1009, Figs.2-4, 5:23-53; Ex1010, Figs.2-4, [Para 23]-[Para 24]; Ex1002, ¶271.

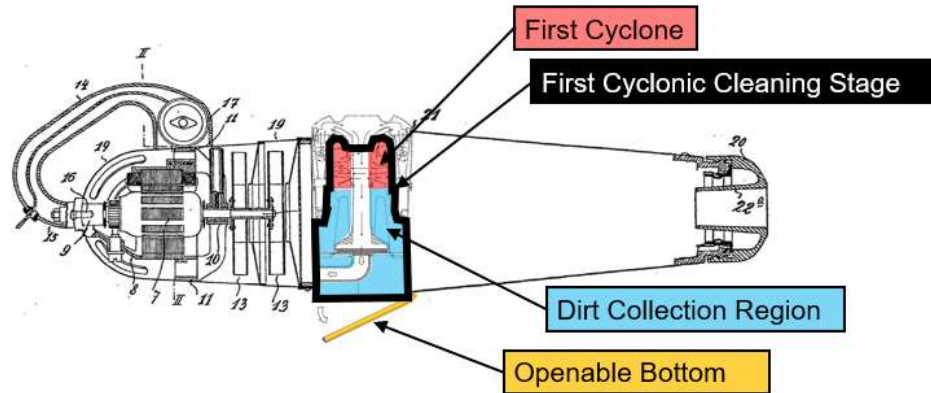
Jung teaches **first cyclonic cleaning stage** (“dust collecting space” of container 51/511) is positioned in the fluid flow path and comprises a **first cyclone** (“upper space”), having a **dirt collection region** (“lower space”), wherein the dirt collection region has an **openable bottom** (bottom lid 51b/512). Ex1002, ¶272. Jung teaches “polluted air flowed into the dust collecting assembly 50/[500] is cleaned firstly by separating large and heavy impurities according to the cyclone principle.” Ex1002, ¶272; Ex1008, [0101]-[0104], [0124], [0133]. With respect to Fig.8, Jung teaches “the bottom lid 51b opens the bottom of the dust collecting container 51 while rotating downward about the hinge 51c.” Ex1002, ¶273; Ex1008, [0121].

FIG. 8



Ex1008, Fig.8; Ex1002, ¶¶272-73.

A POSA would have understood the Lehmann, Fester336 and Jung likewise combination has a **first cyclonic cleaning stage** in the fluid flow path with a **first cyclone** that has a **dirt collection region** with an **openable bottom**:



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶274.

d. [1c]

A POSA would have understood that Lehmann in combination with Fester336 and Jung teaches this limitation. Ex1002, ¶¶276-81. Fester336 teaches the **second cyclonic cleaning stage** (secondary cyclonic chamber 101) is positioned in the fluid flow path downstream from the first cyclonic cleaning stage (primary cyclonic toroidal chamber 48 and dirt collection region 56) and comprises a **central longitudinal axis** (central longitudinal axis A), the **second cyclonic cleaning stage** comprising a **plurality of cyclones** (secondary cyclones 102) in parallel and arranged around a **central portion** (air duct 92):

103

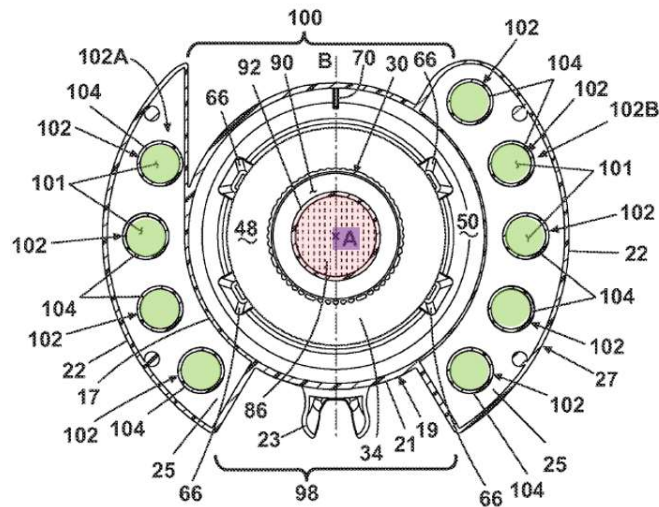
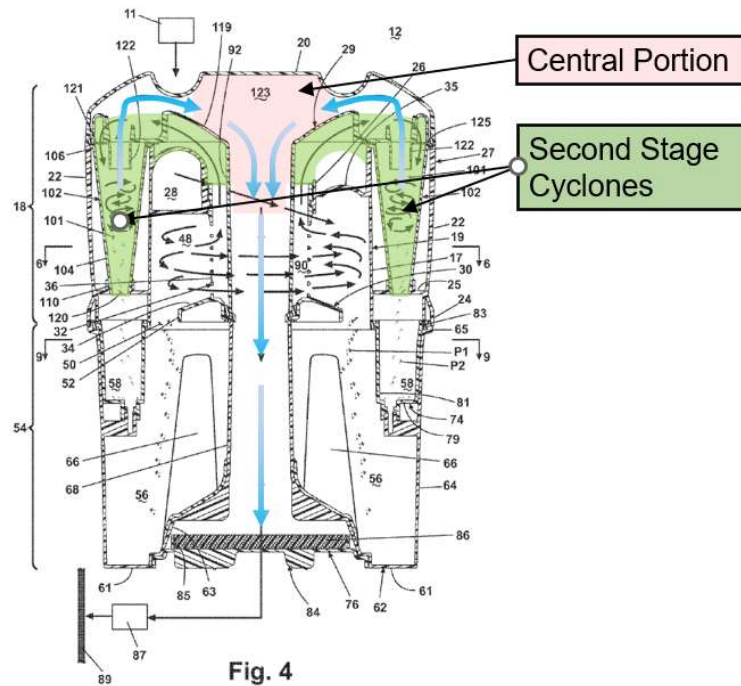


Fig. 5

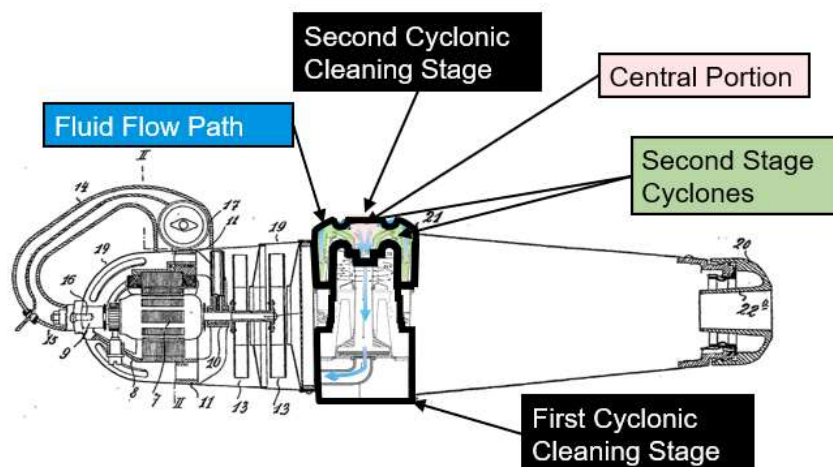
Ex1009, Fig.5, 6:11-20; Ex1002, ¶278.

Fester336 further teaches that the air, after exiting the **second stage cyclones** (secondary cyclones 102), enters an upper portion of the **central portion** (air duct 92) and exits the **central portion** at a position below the upper portion where the air entered the **central portion**. Ex1009, Fig.4, 4:63-65, 5:65-6:10, 10:18-28, 10:54-57; Ex1002, ¶279. Fester336 teaches “the working air that exits the secondary cyclones 102 flows downward through the working air conduit formed by the air duct 92 and the standpipe 68 directly to the suction source 87”:



Ex1009, Fig.4, 10:54-57, Ex1010, Fig.4, [Para 21], [Para 26], [Para 31], [Para 38];
Ex1002, ¶279.

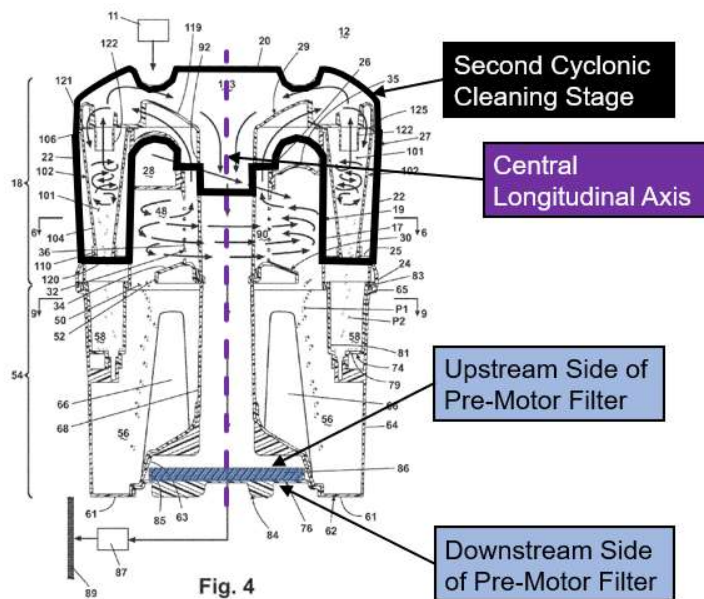
A POSA would have understood the Lehmann, Fester³³⁶ and Jung combination, which maintains these features, likewise teaches this limitation:



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶¶280-81.

e. **1[d]**

A POSA would have understood that the Lehmann, Fester336 and Jung combination teaches this limitation. Ex1002, ¶¶282-86. Fester336 teaches the **pre-motor filter** (filter assembly 76) is positioned in the fluid flow path downstream from the **second cyclonic cleaning stage** (secondary cyclonic chamber 101) and comprises upstream and downstream sides wherein the **central longitudinal axis** (central longitudinal axis A) extends through a volume occupied by the **pre-motor filter**:



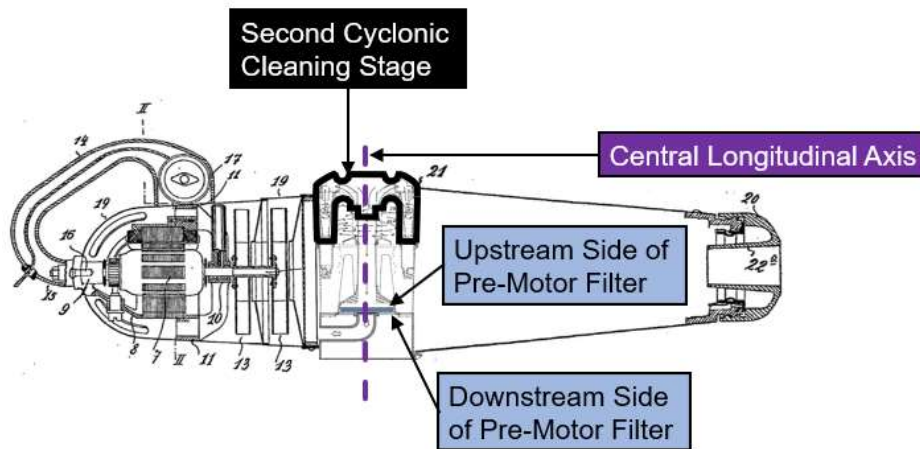
Ex1009, Fig.4, 9:17-30, 10:18-36; Ex1010, Fig.4, [Para 35], [Para 38]; Ex1002, ¶283.

Fester336 teaches that, after exiting secondary cyclones 102, “working air [] passes downward through the air outlet duct 92, through the dirt cup standpipe 68, and into the filter assembly 76, where the filter element 86 captures additional

particulate material before the working air is drawn into the suction source 87.”

Ex1009, 10:23-28; Ex1010, [Para 38]; Ex1002, ¶284.

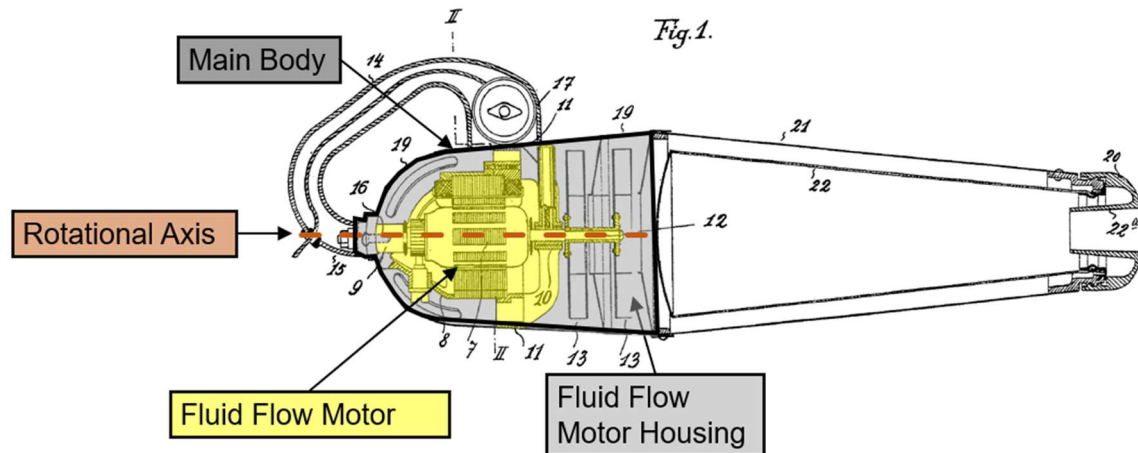
A POSA would have understood the Lehmann, Fester336 and Jung combination, which retains Fester336’s air treatment portion and pre-motor filter, likewise teaches this limitation:



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶¶285-86.

f. 1[e]

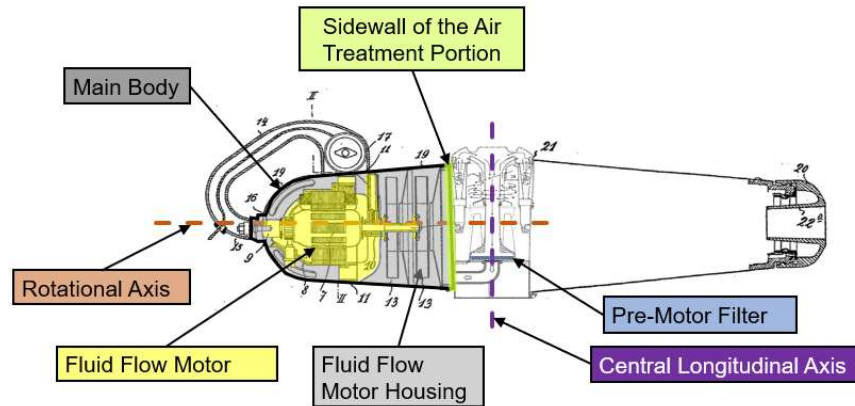
A POSA would have understood that the Lehmann, Fester336 and Jung combination teaches this limitation. Ex1002, ¶¶287-91. Lehmann teaches the **main body** (casing 19) comprises a **fluid flow motor housing** (portion of casing 19 housing electromotor 7) for a fluid flow motor (**electromotor 7**) that is disposed in the fluid flow path, wherein the fluid flow motor has a **rotational axis**:



Ex1011, Fig.1, 1:63-87; Ex1002, ¶288.

Lehmann teaches “[t]he shaft [12] of the electromotor 7 has bearings at 9 and 10” and that shaft 12 drives a “two stage centrifugal fan 13.” Ex1011, 1:63-87; Ex1002, ¶289. A POSA would have understood that the motor rotates about an axis defined by shaft 12. Ex1002, ¶289.

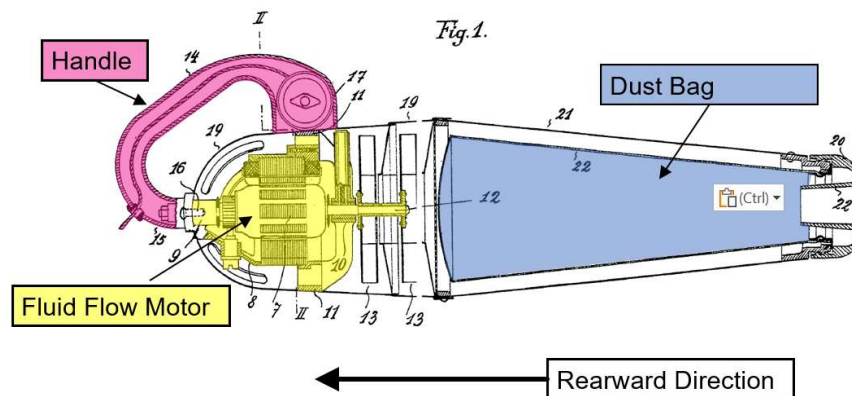
A POSA would have understood the Lehmann, Fester336, and Jung combination teaches the **main body** (casing 19) comprises a **fluid flow motor housing** (portion of casing 19 housing electromotor 7) for a fluid flow motor (**electromotor 7**) that is disposed in the fluid flow path downstream from the **pre-motor filter** (Fester336’s filter assembly 76), wherein the fluid flow motor has a **rotational axis** and a projection of the **rotational axis** (axis defined by shaft 12) intersects the **central longitudinal axis** (Fester336’s central longitudinal axis A) and the **fluid flow motor housing** is secured to only a portion of a **sidewall of the air treatment portion**:



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶¶290-91.

g. 1[f]

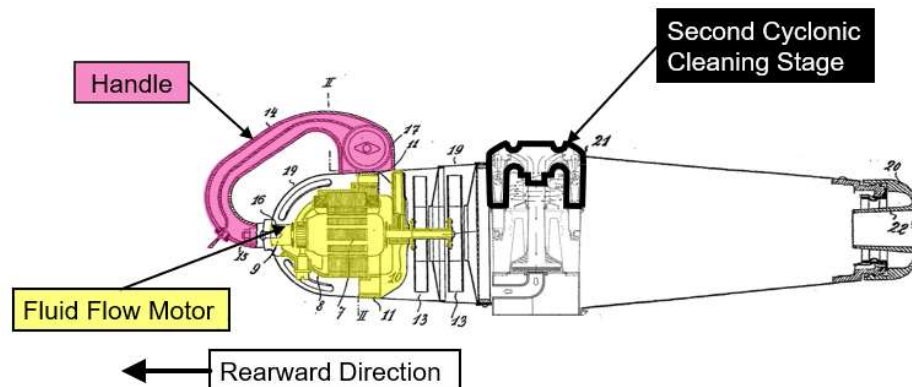
A POSA would have understood that Lehmann in combination with Fester336 and Jung teaches this limitation. Ex1002, ¶¶292-95. Lehmann teaches that the fluid flow motor (**electromotor 7**) and a **handle** (handle 14) are positioned rearward of its **dust bag separator**:



Ex1011, Fig.1, 1:63-87; Ex1002, ¶293.

A POSA would have understood the Lehmann, Fester336, and Jung combination teaches the fluid flow motor (**electromotor 7**) and a **handle** (handle 14) of the hand vacuum cleaner are positioned rearward of the **second cyclonic**

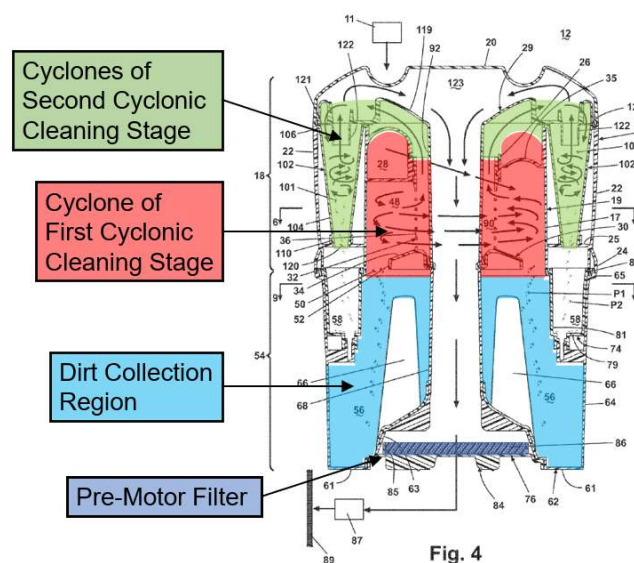
cleaning stage (Fester336's secondary cyclonic chamber 101):



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶¶294-95.

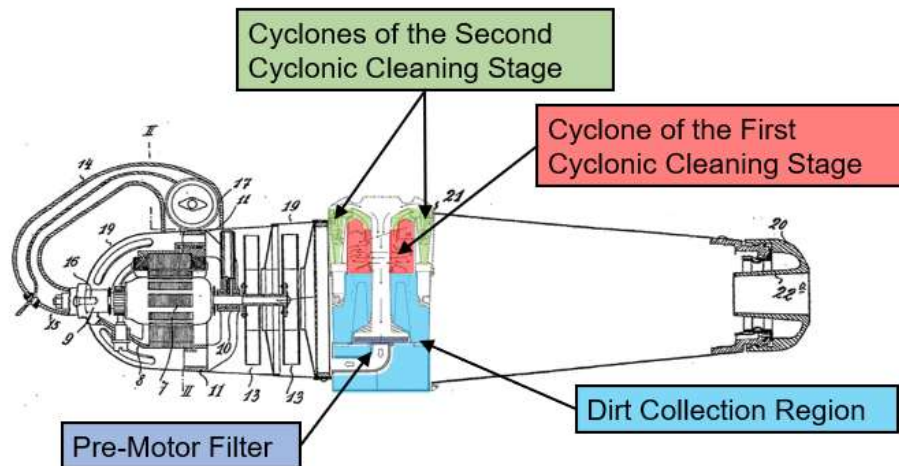
h. 1[g]

The Lehmann, Fester336 and Jung combination teaches this limitation. Ex1002, ¶¶296-301. Fester336 teaches the **dirt collection region** (dirt collection region 56) is positioned beneath and vertically aligned with the cyclones of the **first** and **second** cyclonic cleaning stages (primary cyclonic toroidal chamber 48 and secondary cyclones 102, respectively) and the **pre-motor filter** (filter assembly 76):



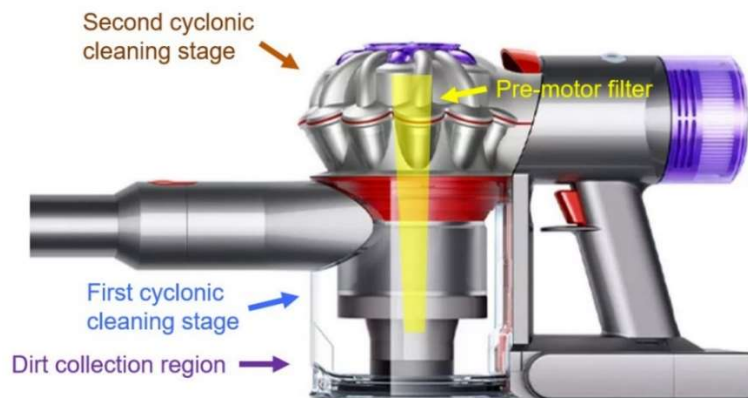
Ex1009, Fig.4, 5:33-53, 6:57-66, 9:17-31; Ex1010, Fig.4, [Para 24], [Para 27], [Para 35]; Ex1002, ¶297.

A POSA would have understood the Lehmann, Fester336 and Jung combination, which incorporates Fester336's air treatment portion and pre-motor filter, likewise teaches this limitation:



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶298.

PO contends the accused V8 vacuum meets this limitation even though the V8's alleged pre-motor filter is narrower than the alleged dirt collection region; if the V8 meets this limitation, so does the combination here:

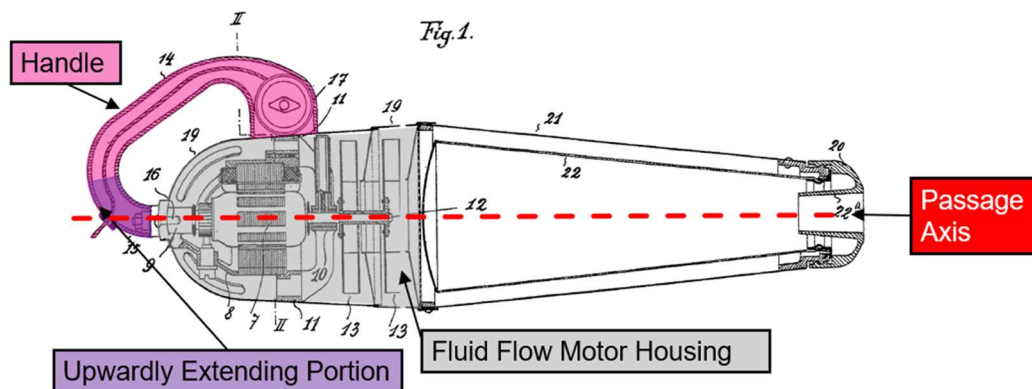


Ex1019, 19-21, 10-13; Ex1002, ¶299.

Further, it also would have been obvious to a POSA to incorporate a larger pre-motor filter in the combination such that it overlies both of Jung's dirt collection regions. Ex1002, ¶300. A POSA would have been motivated to use a filter with a large cross-sectional area to minimize the pressure drop across the filter and reduce the frequency of filter cleaning and replacement, and would have had a reasonable expectation of success. Ex1002, ¶¶300-01.

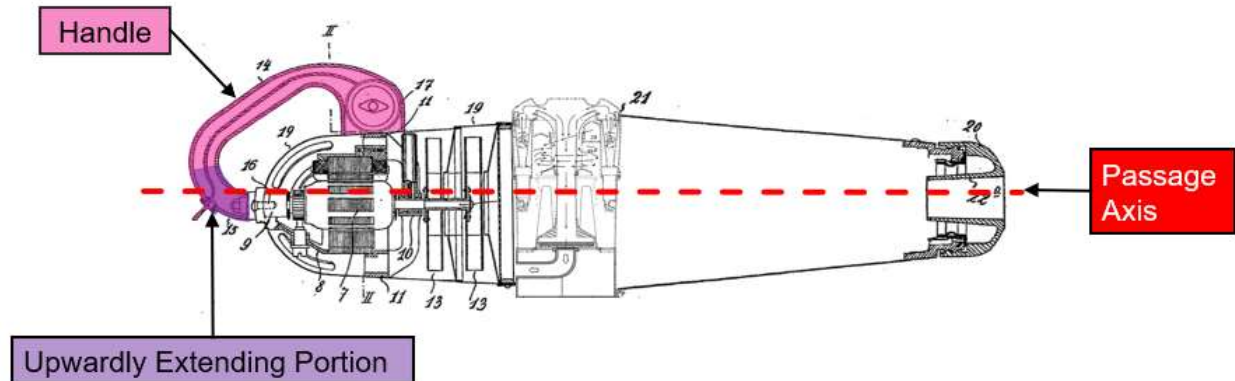
i. **1[h]**

A POSA would have understood that Lehmann in combination with Fester336 and Jung teaches this limitation. Ex1002, ¶¶302-05. Lehmann teaches the **handle** (handle 14) comprises an **upwardly extending portion** when the hand vacuum cleaner is positioned on a horizontal surface, the **upwardly extending portion** extends away from the **fluid flow motor housing** and the **passage axis** of the dirty fluid inlet intersects the **upwardly extending portion** of the **handle**:



Ex1011, Fig.1, 1:63-87; Ex1002, ¶303.

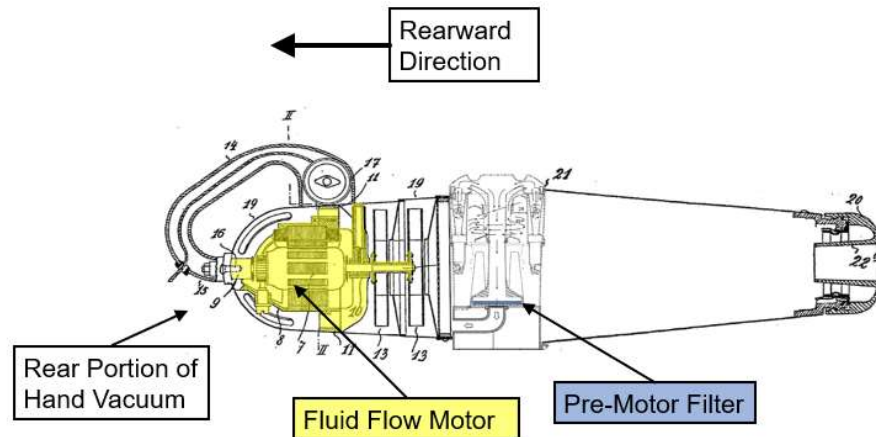
A POSA would have understood the Lehmann, Fester336 and Jung combination, which incorporates Lehmann's **handle**, **fluid flow motor housing**, and dirty fluid inlet (including **passage axis**), likewise teaches this limitation:



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶¶304-05.

3. [2]

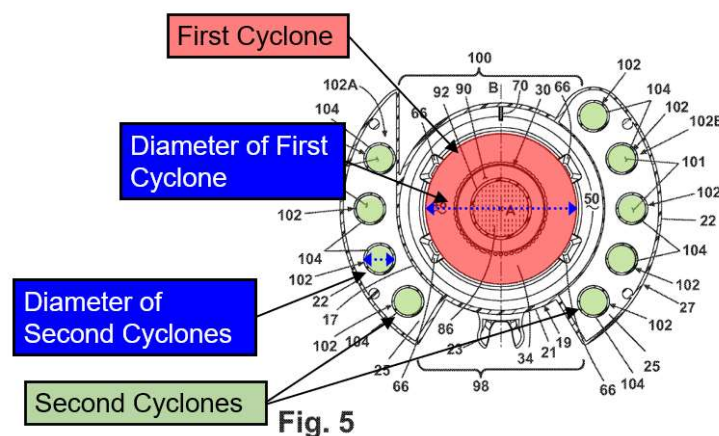
A POSA would have understood that Lehmann in combination with Fester336 and Jung teaches this claim and renders claim 1 obvious. Ex1002, ¶¶306-09. The Lehmann, Fester336 and Jung combination teaches the **fluid flow motor** (Lehmann's electromotor 7) is provided in a rear portion of the hand vacuum cleaner and the **pre-motor filter** (Fester336's filter assembly 76) is provided forward of the rear portion:



Ex1011, Fig.1(modified), 1:63-70; Ex1009, Fig.4, 10:18-33; Ex1010, [Para 38];
Ex1008, Fig.6; Ex1002, ¶¶308-09.

4. [3]

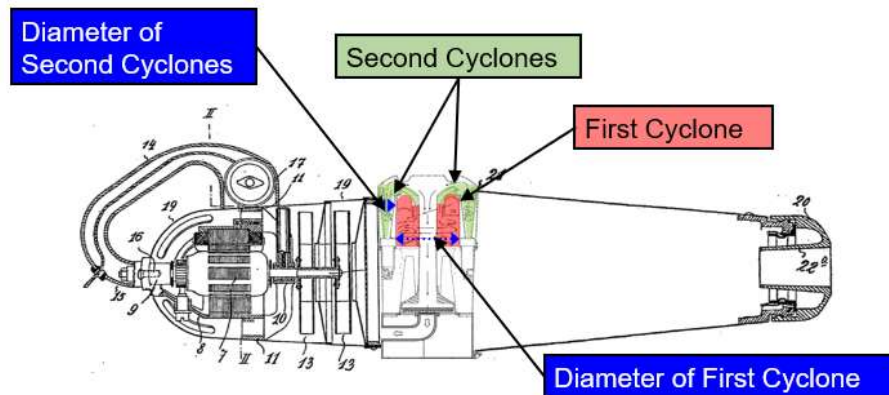
A POSA would have understood that the Lehmann, Fester336 and Jung combination teaches this claim and renders claim 1 obvious. Ex1002, ¶¶310-15. Fester336 teaches each of the **second cyclones** (secondary cyclones 102) are smaller than the **first cyclone** (“primary cyclonic toroidal chamber 48”):



Ex1009, Figs.2, 4, 5; *see also* Ex1010, Figs.2, 4, 6; Ex1002, ¶312.

A POSA would have understood that the Lehmann, Fester³³⁶ and Jung

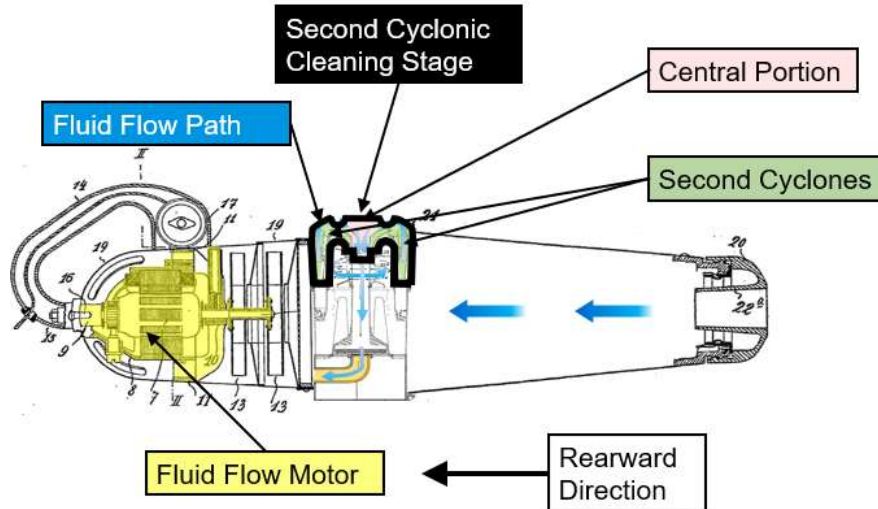
combination, which incorporates Fester336's **first** and **second** cyclones, likewise teaches this limitation:



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶¶313-14.

5. [4]

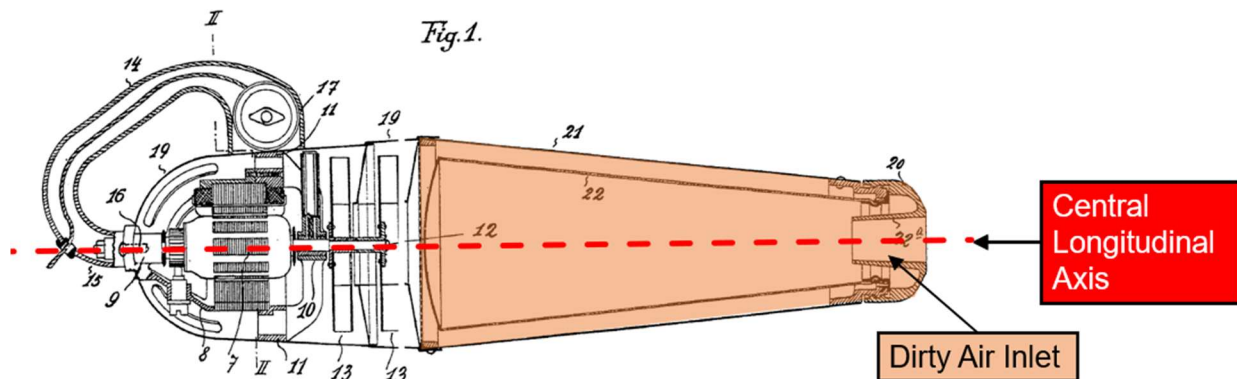
A POSA would have understood that the Lehmann, Fester336 and Jung combination teaches this claim and renders claim 1 obvious. Ex1002, ¶¶315-18. A POSA would have understood the combination teaches the **fluid flow motor** (Lehmann's electromotor 7) is rearward of the second **cyclonic cleaning stage** (Fester336's secondary cyclonic chamber 101) and air travels downwardly through the **central portion** (Fester336's air duct 92) prior to travelling rearwardly (through Jung's inner flow tube 57) to the fluid flow motor.



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶¶317-18.

6. [5]

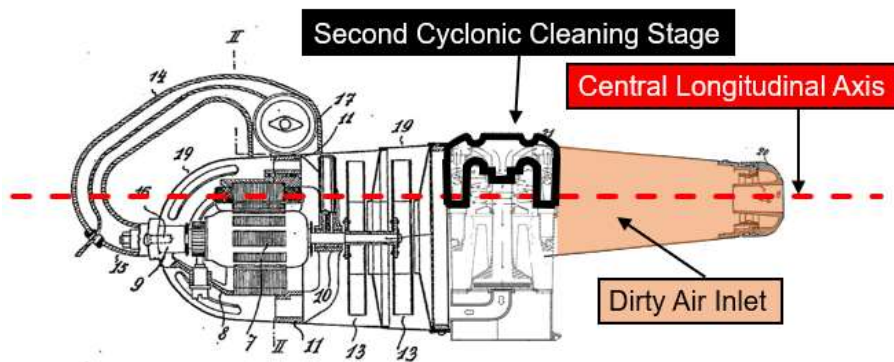
A POSA would have understood that the Lehmann, Fester336 and Jung combination teaches this claim and renders claim 1 obvious. Ex1002, ¶¶319-26. Lehmann's **dirty air inlet** (inwardly directed coned socket 22a and tapering part 21) has a **central longitudinal axis**:



Ex1011, Fig.1, Claim 1, 1:38-44, 1:63-73, 2:7-24, 2:39-41; Ex1002, ¶321.

A POSA would have understood the Lehmann, Fester336 and Jung

combination would allow for the **central longitudinal axis** of the **dirty air inlet** passes beneath Fester336's secondary cyclones 102. Ex1002, ¶322. However, it would have been obvious to a POSA to modify the combination so that the **dirty air inlet** (Lehmann's inwardly directed coned socket 22a) has a **central longitudinal axis** and a projection of the dirty air inlet central longitudinal axis intersects the **second cyclonic cleaning stage** (Fester336's secondary cyclonic chamber 101):



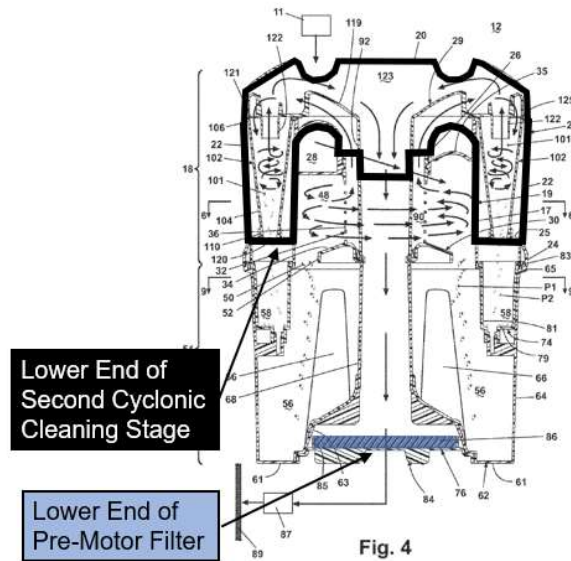
Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶¶322-26.

A POSA would have been motivated to move Lehmann's tapering part 21 and inwardly directed coned socket 22a vertically, closer to Fester336's inlet 28, which introduces air to primary cyclonic toroidal chamber 48. Ex1009, 4:65-5:3; 5:23-32; Ex1010, [Para 21], [Para 23]; Ex1002, ¶323. This change would have resulted in the central longitudinal axis of the dirty air inlet intersecting Fester336's second cyclonic cleaning stage because inlet 28 extends through secondary cyclonic chamber 101 to reach primary cyclonic toroidal chamber 48. Ex1009, Fig.3, 4:65-5:3; Ex1010, Fig.3, [Para 21]; Ex1002, ¶323.

A POSA would have been motivated to make this change to minimize changes in the direction of airflow and lower the likelihood that inlet 28 would clog with debris. Ex1002, ¶324. A POSA would have understood that this combination would have produced a more compact design improved comfort, maneuverability, and space usage. *Id.* This modification also would have been obvious to try because a POSA would have recognized that there were a limited number of ways to arrange the dirty air inlet (including the passage axis) and the second cyclonic cleaning stage, and configurations in which the passage axis and second cyclonic cleaning stage intersect meets the claims. Ex1002, ¶325. A POSA would have had a reasonable expectation of success selecting such arrangement. *Id.*

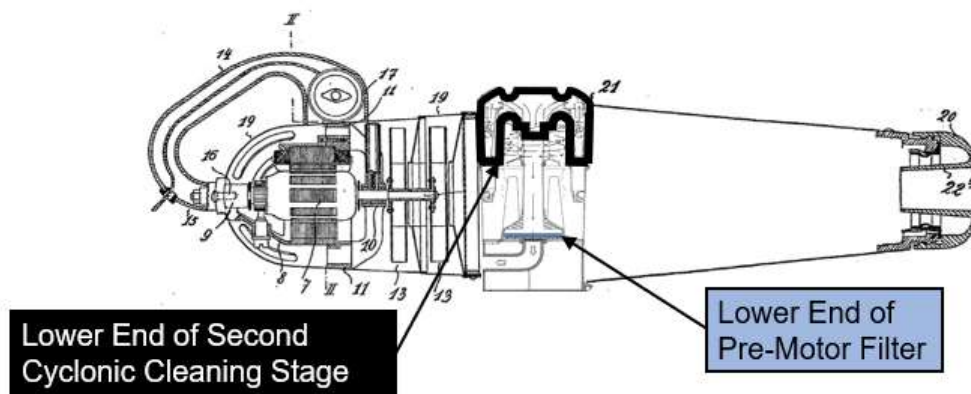
7. [6]

A POSA would have understood the Lehmann, Fester336 and Jung combination teaches this claim and renders claim 1 obvious. Ex1002, ¶¶327-31. Fester336 teaches a lower end of the **pre-motor filter** (filter assembly 76) is located below a lower end of the **second cyclonic cleaning stage** (secondary cyclonic chamber 101):



Ex1009, Figs.2, 4, 5:33-53, 6:57-66, 9:17-31; Ex1010, Figs.2, 4, [Para 24], [Para 27], [Para 35]; Ex1002, ¶329.

A POSA would have understood the Lehmann, Fester336 and Jung combination, which incorporates Fester336's **second cyclonic cleaning stage** and **pre-motor filter**, likewise teaches this limitation:

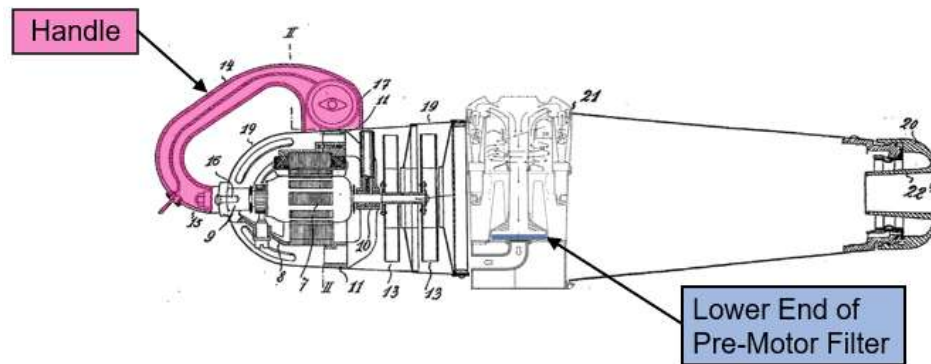


Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶¶330-31.

8. [7]

A POSA would have understood the Lehmann, Fester336 and Jung

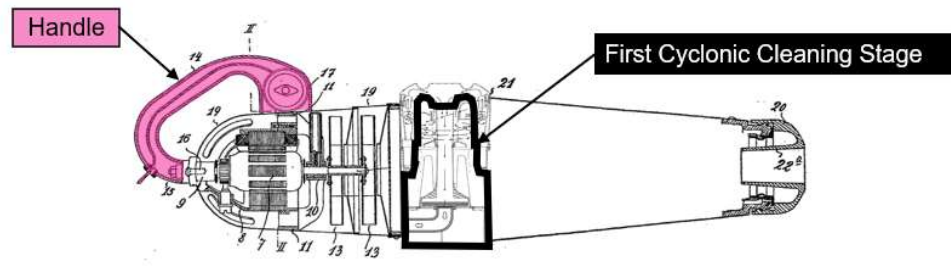
combination teaches this claim and renders claim 1 obvious. Ex1002, ¶¶332-35. A POSA would have understood the combination teaches a portion of a **handle** (Lehmann's handle 14) of the hand vacuum cleaner is located above a lower end of the **pre-motor filter** (Fester336's filter assembly 76):



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶¶334-35.

9. [8]

A POSA would have understood the Lehmann, Fester336 and Jung combination teaches this claim and renders claim 1 obvious. Ex1002, ¶¶336-40. A POSA would have understood that the combination teaches an end of the **handle** (Lehmann's handle 14) is mounted to the hand vacuum cleaner at a position adjacent an upper end of the **first cyclonic cleaning stage** (Fester336's primary cyclonic toroidal chamber 48 and dirt collection region 56):



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶338.

The handle is adjacent the upper end of the first cyclonic cleaning stage to the same extent as the embodiments in the '666Patent, which show handle 174 mounted to the vacuum at a location displaced from cyclonic cleaning stage 116.

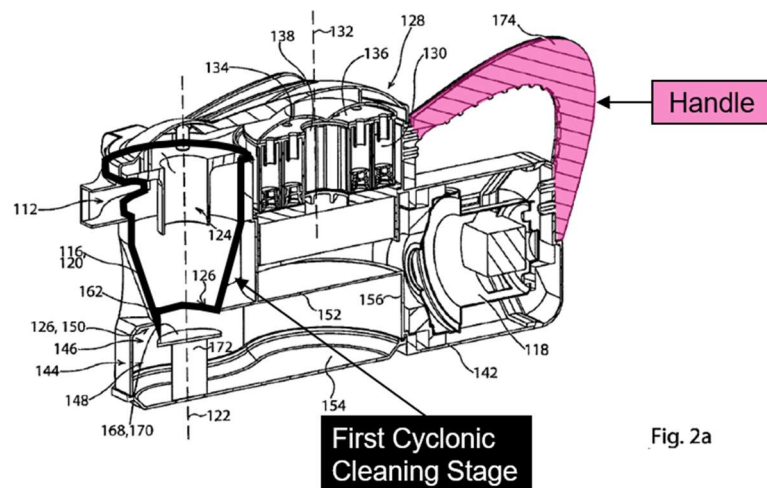


Fig. 2a

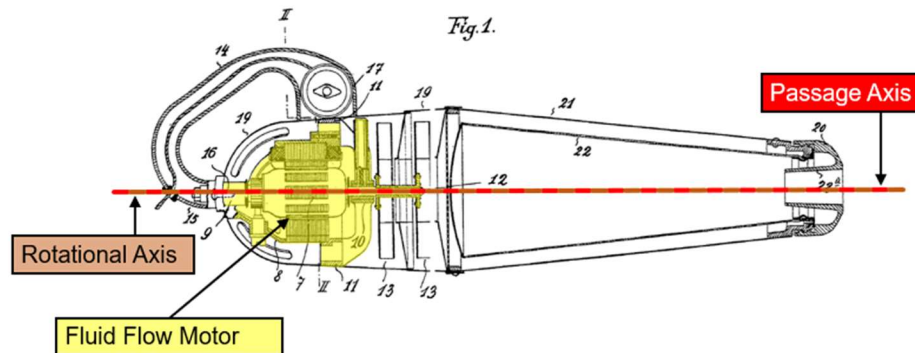
Ex1001, Fig.2a, 4:1-7, 7:32-34; Ex1002, ¶339.

10. [9], [10]

A POSA would have understood that the Lehmann, Fester336 and Jung combination teaches these claims and renders claims 1 and 9 obvious. Ex1002, ¶¶341-42; *see* §VIII.B.2.b.

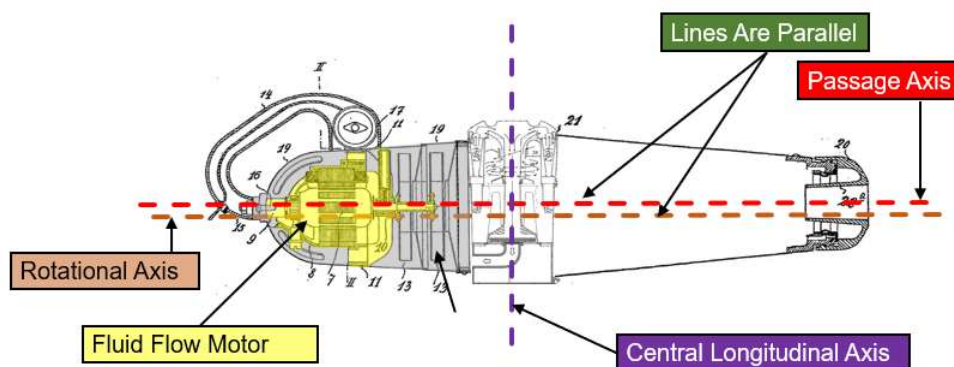
11. [11]

A POSA would have understood that the Lehmann, Fester336 and Jung combination renders this claim obvious. Ex1002, ¶¶343-49. Lehmann teaches the **rotational axis** of the fluid flow motor is coaxial with the **passage axis**, which has been maintained in the combination with Fester336 and Jung:



Ex1011, Fig.1; Ex1002, ¶345.

In the combination, it would have been obvious to a POSA offset these axes such that the **rotational axis** axis of the fluid flow motor is displaced from the **passage axis** in a direction parallel to the **central longitudinal axis** and to also align the motor axis with the outlet pipe:



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶346.

A POSA would have been motivated to move Lehmann's tapering part 21 and inwardly directed coned socket 22a vertically, closer to Fester336's inlet 28, which introduces air to primary cyclonic toroidal chamber 28. Ex1009, 4:65-5:3; 5:23-32; Ex1010, [Para 21], [Para 23]; Ex1002, ¶347. This would have minimized changes in the direction of airflow and lowered the likelihood that inlet 28 would clog with debris. Ex1002, ¶347. This modification also would have been obvious to try. Ex1002, ¶348. A POSA would have recognized that there were a limited number of ways to arrange the dirty air inlet (including passage axis) and the motor (including rotational axis), and configurations in which the passage and rotational axes are offset from one another meets the claims. *Id.* Ex1002, ¶348.

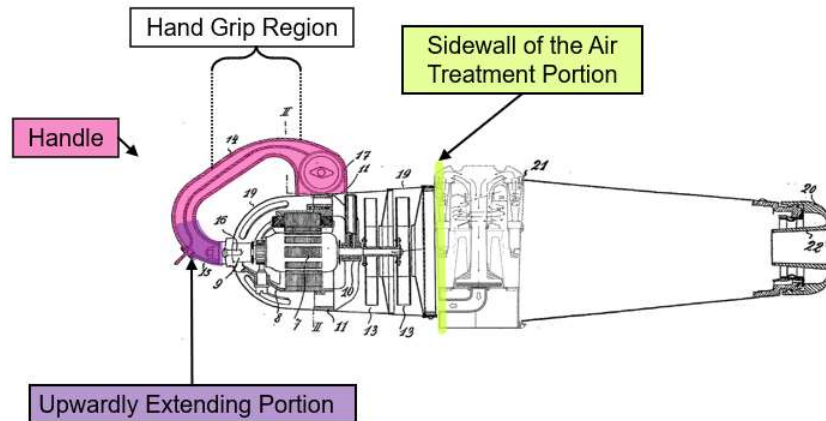
12. [12]

A POSA would have understood that the Lehmann, Fester336 and Jung combination teaches this claim, renders claim 11 obvious. *see* §VIII.B.11. Further, as explained in Ground 1, it would both reduce the overall size of the vacuum and increase its maneuverability and ease of use. §VIII.A.13. A POSA would have understood that this combination would be a more compact design that would allow for more comfort and maneuverability of use. Ex1002, ¶350. Lehmann in combination with Fester336 and Jung renders obvious this claim. *Id.*; *see* §VIII.B.11.

13. [13]

A POSA would have understood that the Lehmann, Fester336 and Jung

combination teaches this claim and renders obvious claim 1. Ex1002, ¶¶351-54. A POSA would have understood the combination teaches a hand grip region positioned between the upwardly extending portion of the **handle** and a portion of the **sidewall of the air treatment portion**:



Ex1011, Fig.1(modified); Ex1008, Fig.6; Ex1009, Fig.4; Ex1002, ¶¶353-54.

IX. SECONDARY CONSIDERATIONS

Petitioners are unaware of any secondary considerations of non-obviousness.

Ex1002, ¶355.

X. DISCRETIONARY FACTORS FAVOR INSTITUTION

A. § 314(a)

Fintiv should not be followed because it exceeds the Director's authority, is arbitrary and capricious, was adopted without notice-and-comment rulemaking, violates the APA and AIA, and because "the PTAB will not rely on the *Fintiv* factors to discretionarily deny institution in view of parallel district court litigation where a petition presents compelling evidence of unpatentability," and this petition presents

such compelling evidence. USPTO Interim Procedure For Discretionary Denials In AIA Post-Grant Proceedings With Parallel District Court Litigation, June 21, 2022, 4-5 (the “Guidance”).

Nevertheless, *Fintiv* favors institution because each factor favors or is neutral for institution. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11.

Factor 1 is neutral: there is no evidence that the court will or will not grant a stay if IPR is instituted, and because no such stay motion has yet been filed, this factor is neutral. *See, e.g., TSMC Ltd. v. Alidouble, Inc.*, IPR2023-00372, Paper 7 at 10 (PTAB July 13, 2023).

Factor 2 favor institution: while the scheduled Litigation trial date is July 21, 2025—approximately 12 months away—any comparison of a projected FWD date against the scheduled trial date is speculative. *See Dish Network v. Broadband iTV*, IPR2020-01280, Paper 17 at 16 (PTAB Feb. 4, 2021) (“We cannot ignore the fact that the currently scheduled trial date is more than nine months away and much can change during this time”); Guidance at 8 (“Stakeholders correctly noted that scheduled trial dates are unreliable and often change[,]” and a “scheduled trial date...is not by itself a good indicator of [when] the district court trial will occur.”). Instead, “when considering the proximity of the district court’s trial date to the date when the PTAB final written decision will be due, the PTAB will consider the median time from filing to disposition of the civil trial for the district in which the

parallel litigation resides.” *Id.* at 3. The median time to trial in the District of Massachusetts is 35.6 months according to Federal Court Management Statistics (12/31/2023). Ex1023. The district court litigation was filed on 8/15/2023, when the ’666Patent was added to an Amended Complaint in Case No. 23-cv-11277, and which indicates an expected trial date of approximately 08/01/2026, approximately 6 months after a FWD. Because the expected trial date is after the FWD deadline, this factor weighs in favor of institution. *Samsung Electronics Co., Ltd. et al v. Staton Techiya, LLC*, IPR2022-00302, Paper 13 at 10-12.

Factor 3 favors institution. “If, at the time of the institution decision, the district court has not issued orders related to the patent at issue in the petition, this fact weighs against exercising discretion to deny institution....” *Apple Inc., v. Fintiv, Inc.*, IPR2020-00019, Paper No. 11 at 10 (PTAB Mar. 20, 2020) (precedential). No such substantive orders have issued with respect to the ’666Patent, and none are expected prior to institution. A *Markman* hearing was originally scheduled for “[o]n or about July 16, 2024, at the Court’s convenience,” but that date has passed, and no *Markman* hearing has yet been set. Litigation, Dkts. 103–04. Further, the parties’ investments in co-pending litigation have been low and will remain low at the time of institution. In the co-pending litigation, PO added the ’666Patent to an Amended Complaint on August 15, 2023 in Case No. 23-cv-11277, which the Court severed on October 13, 2023 as Case No. 23-cv-12372. On October 10, 2023, Dyson filed a

motion to dismiss, which remains pending, and Dyson filed an Answer to the Complaint on May 10, 2024. Litigation, Dkt. 76. Fact discovery began on 10/30/2023, no fact depositions have yet been taken. Litigation, Dkts. 103–04. PO served its infringement contentions on December 15, 2023, and has a pending motion to amend those contentions. Ex1024 (Litigation, Dkt. 103).

Factor 4 favors institution because there is little overlap between the two proceedings. This Petition challenges claim 5, which is not at-issue in the Litigation, *see* Ex1025, 2; and Petitioners stipulate that, unless the Board denies or later vacates institution of this Petition, Petitioners will not seek resolution of invalidity in the copending litigation based on the specific grounds asserted in this Petition. Ex1026.

Factor 5 favors institution because although Petitioners and PO are also parties to the parallel litigations, the expected timing of the trial date favors institution. *Fusion Orthopedics, LLC v. Extremity Medical, LLC*, IPR2023-00894 Paper 15, at 32 (PTAB Nov. 17, 2023).

Factor 6 favors institution because, as shown in §VIII, this Petition presents a compelling case of invalidity, based entirely on art that was not of record during prosecution.

The *General Plastics* factors favor institution because this is the only petition against the '666Patent. *General Plastics Indus. Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19, 9-10.

B. § 325(d)

The §325(d) factors favor institution, as all six Becton Dickinson factors weigh in favor of institution. *Becton, Dickinson, & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (PTAB Dec. 15, 2017); *see also Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020).

The Board has consistently “held that a reference that ‘was neither applied against the claims nor discussed by the Examiner’ does not weigh in favor of exercising [] discretion under §325(d).” *Fasteners for Retail, Inc. v. RTC Indus., Inc.*, IPR2019-00994, Paper 9 at 7-11 (PTAB Nov. 5, 2019). The prior art references relied on herein were not cited on the face of the ’666Patent. While the published version of the application that issued as Fester336 (US2006/0123590) was cited in an IDS, and Fester was cited in an examiner’s search (Ex1004, 785, 791), the examiner neither discussed them or applied them against the claims. The examiner did not address the combination of prior art presented in this Petition, and the relied-upon references were not previously meaningfully before the Office. *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469 Paper 6, 9-11 (PTAB Feb. 13, 2020) (precedential).

Because Petitioners “cannot be expected to anticipate every argument that may be raised by a patent owner” regarding §325(d), if PO raises such a challenge,

Petitioners request the opportunity to respond, including to address why such a challenge was not reasonably foreseeable; why the references that were not disclosed are non-cumulative; and/or why the Examiner misapprehended and/or overlooked the art at issue. *Google LLC v. Valtrus Innovations Ltd.*, IPR2022-01197, Paper 12 at 5 (PTAB Mar. 29, 2023) (vacating denial of institution based on §325(d)).

XI. MANDATORY NOTICES UNDER 37 C.F.R. §42.8

A. Real Parties-in-Interest

Petitioners identify themselves as the real parties-in-interest.

B. Related Matters

To the best of Petitioners' knowledge, apart from the the Litigation, *SharkNinja Operating LLC v. Dyson, Inc.*, No. 1:23-cv-12372, Dkt. 58-1 at 3, 6 (D. Mass.), the '666Patent has not been involved in any litigation, *inter partes* or post-grant review prior to this proceeding.

C. Lead and Backup Counsel, Service, and Power of Attorney

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Lead Counsel	Back-Up Counsel
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Petitioners concurrently submit a Power of Attorney, 37 C.F.R. § 42.10(b), and consent to electronic service at DysonIPR@kirkland.com.

XII. PAYMENT OF FEES UNDER 37 C.F.R. §42.103

Petitioners concurrently electronically submit the required fees for this Petition. The Board is authorized to charge Deposit Account No. 506092 for any fee deficiency.

DATED: July 26, 2024

Respectfully submitted,
KIRKLAND & ELLIS LLP

/s/ Christian Huehns

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CERTIFICATE OF COMPLIANCE

This Petition complies with the type-volume limitations as mandated in 37 C.F.R. § 42.24, totaling 13,932 words. Counsel has relied upon the word count feature provided by Microsoft Word.

/s/Sheryl Brongiel

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e)(4)(i) *et seq.* and 42.105(b), the undersigned certifies that a copy of the foregoing document with the accompanying Exhibits listed in Petitioners' Exhibit List was caused to be served by Federal Express, costs prepaid, to PO at the following address of record:

1059 – Bereskin & Parr LLP / S.E.N.C.R.L., srl.
40 King Street West
40th Floor
Toronto, ON
Canada

A copy was also served via electronic mail and FTP on the attorneys of record in the following related matter, SharkNinja Operating LLC et al. v. Dyson, Inc. et al., 1:23-cv-12372-ADB (D. Mass.):

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/s/ Sheryl Brongiel