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(54) **COUNTERWEIGHT WITH FASCIA DESIGN OF FUNCTIONAL DOOR**

(57) A horizontal axis laundry treatment machine (10) having a housing (12) and a cylindrical tub (28) horizontally mounted inside of the housing (12), a drum rotatably mounted within the tub, the drum defining a treatment chamber (18); the drum is configured to spin. A

front ring assembly (44) surrounds a drum opening to the treatment chamber (18). At least one counterweight (46a or 46b) is positioned between a front surface of the front ring assembly (44) and a fascia (20) that substantially covers the front ring assembly (44).

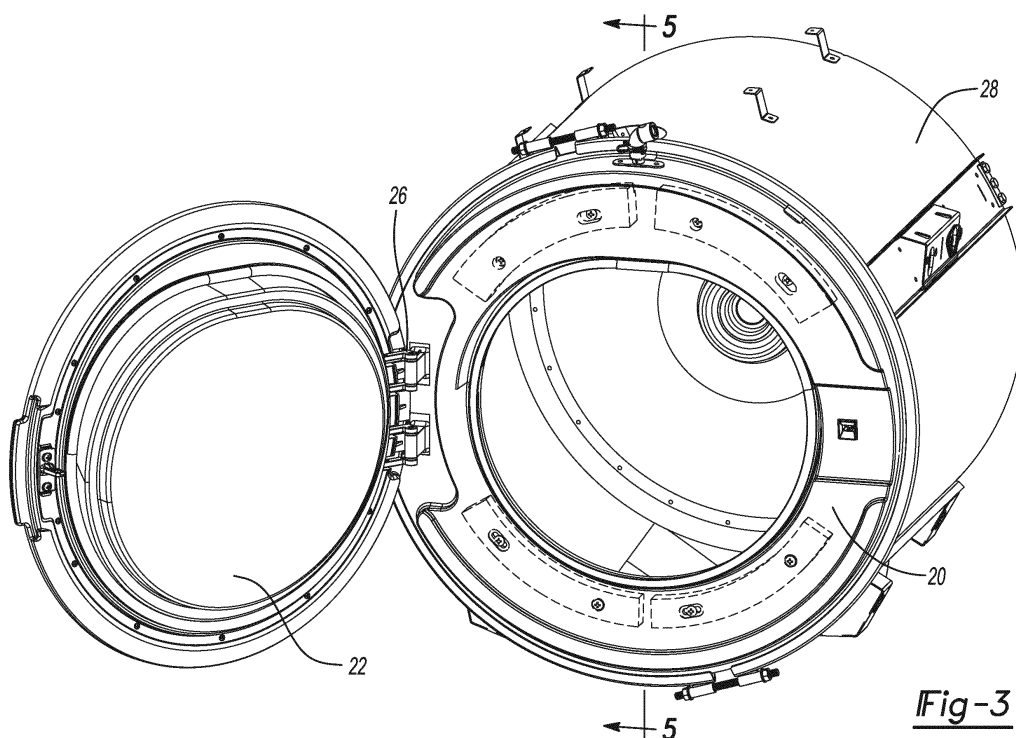


Fig-3

Description

FIELD

[0001] The present disclosure relates to a horizontal axis laundry treatment machine.

BACKGROUND

[0002] This section provides background information related to the present disclosure which is not necessarily prior art.

[0003] Laundry treatment machines, such as automatic washing machines, include a tub suspended within a housing, wherein laundry placed therein is treated, e.g., washed. Generally, the tub is a cylindrical structure. A drum is rotatably mounted within the tub, defining a treatment chamber. The tub may be mounted horizontally within the housing (a "horizontal axis" machine), in which case the treatment chamber is accessed through an opening in a front end of the tub, through a door mounted on the front side of the laundry treatment machine housing. Washer/dryer combo machines (i.e., a single machine in which a load of laundry is both washed and dried in the same treatment chamber) are normally configured as horizontal axis machines as described above.

[0004] Horizontal axis machines typically include counterweights to ballast the tub when the drum spins about its longitudinal axis, such as during a spin cycle. Counterweights may be made from a variety of materials, such as concrete, steel, and other dense materials. It is known to attach counterweights to the top and bottom of the outer surface of the tub. Attaching counterweights to the top and bottom on the tub of a horizontal axis laundry treatment machine, while effective, requires additional space between the outer wall of the tub and the housing to account for the upper and lower counterweights.

[0005] Therefore, the inventors hereof have identified a need, particularly in view of trends toward the demand for larger treatment chambers (and therefore larger tubs, housing the drums) and the inclusion of additional components inside of the housing of laundry treatment machines, especially washer/dryer combo machines, to position counterweights at locations other than the top and bottom of the outside surface of the tub.

SUMMARY

[0006] This section provides a general summary of the disclosure, and is not a comprehensive disclosure of its full scope or all of its features.

[0007] A laundry treatment machine is disclosed. The laundry treatment machine has a housing and a cylindrical tub horizontally mounted inside of the housing. A drum is rotatably mounted within the tub, defining a treatment chamber and an opening through which to place laundry in the treatment chamber. The laundry treatment machine further has a front ring assembly surrounding the

outer periphery of the drum opening and at least one counterweight. In one embodiment, the at least one counterweight is mounted to the front ring assembly. In another embodiment, the at least one counterweight is positioned between a front surface of the front ring assembly and a front fascia.

DRAWINGS

[0008] The drawings described herein are for illustrative purposes only of selected embodiments and not all possible implementations, and are not intended to limit the scope of the present disclosure.

FIG 1 illustrates a horizontal axis laundry treatment machine.

FIG 2a illustrates a side view of a known drum of a horizontal axis laundry treatment machine showing counterweights mounted on the top and bottom of the drum.

FIG 2b illustrates a top view of the drum in FIG 2a, showing one of the counterweights mounted to the top of the drum.

FIG 2c illustrates a bottom view of the drum in FIG 2c, showing one of the counterweights mounted to the bottom of the drum.

FIG 3 illustrates an isolated view of the drum and door of a horizontal axis laundry treatment machine according to an embodiment of the invention.

FIG 4 illustrates an isolated view of the front ring assembly of the drum illustrated in FIG 3 without the front fascia, showing counterweights mounted to the front ring assembly.

FIG 5 illustrates a side view of the front ring assembly of FIG 3 showing both the front ring assembly and the front fascia.

FIG 6 is a magnified view of the upper and lower portions of the front ring assembly and front fascia shown in FIG 5.

DETAILED DESCRIPTION

[0009] Example embodiments will now be described more fully with reference to the accompanying drawings.

[0010] FIG 1 generally illustrates a horizontal axis laundry treatment machine 10, such as a washer or washer/dryer combo. The laundry treatment machine 10 includes a housing 12 and a tub 28, the tub 28 being preferably suspended within the housing 12. A drum is rotatably mounted within the tub, defining a treatment chamber 18 and an opening through which to place laundry into the treatment chamber 18. A front ring assembly (not visible in FIG 1) surrounds the drum opening to the treatment chamber 18. A fascia 20 covers the front ring assembly. The fascia 20 may be a circular component made in a single piece. A door 22, having a handle 24, is connected to the front ring assembly (which is positioned behind fascia 20) by hinge 26. A display 34 may be dis-

posed on the front of the housing 12.

[0011] FIGS 2a-2c illustrate a side view, top view and bottom view, respectively, of a tub 28 as configured in a known horizontal axis laundry treatment machine. Notably, the a bottom counterweight 40 is mounted to the bottom of the tub 28 and a top counterweight 42 is mounted to the top of the tub 28.

[0012] FIG 3 illustrates a tub 28 and a door 22 of a laundry treatment machine according to an embodiment of the invention. The laundry treatment machine includes a front ring assembly (not visible) mounted to the tub 28 and covered by a fascia 20. The fascia 20 may be a circular component made in a single piece. Door 22 is connected to the front ring assembly 44 by hinge 26.

[0013] FIG 4 is a front view illustration of the front ring assembly 44 mounted to the tub 28 shown in FIG 3, with the fascia 20 removed. Counterweights 46a and 46b are mounted or fastened to the front surface of front ring assembly 44. Upper counterweights 46a are mounted or fastened to the upper portion of the front ring assembly 44, and lower counterweights 46b are mounted to the lower portion of front ring assembly 44.

[0014] FIG 5 is a side view illustration of the front ring assembly 44 shown in FIG 4 and the front fascia 20. FIG 6 is a magnified view of the upper portion and lower portion of the front ring assembly 44 and front fascia 20 shown in FIG 5. As illustrated in both FIGS 5 and 6, upper counterweights 46a and lower counterweights 46b are positioned between the front ring assembly 44 and the front fascia 20. Counterweights 46a and 46b are shown mounted or fastened to front ring assembly 44.

[0015] Though not illustrated, it is also contemplated and within the scope of this disclosure to attach the upper and lower counterweights 46a and 46b to the front fascia 20 (instead of the front ring assembly 44), still maintaining the same position of the counterweights between the front ring assembly 44 and the front fascia 20.

[0016] The foregoing description of the embodiments has been provided for purposes of illustration and description. It is not intended to be exhaustive or to limit the disclosure. Individual elements or features of a particular embodiment are generally not limited to that particular embodiment, but, where applicable, are interchangeable and can be used in a selected embodiment, even if not specifically shown or described. The same may also be varied in many ways. Such variations are not to be regarded as a departure from the disclosure, and all such modifications are intended to be included within the scope of the disclosure.

Claims

1. A horizontal axis laundry treatment machine (10), comprising:

a housing (12);
a cylindrical tub (28) within the housing (12),

a drum rotatably mounted within the tub (28), defining a treatment chamber (18) and an opening to the treatment chamber (18) through which to place laundry into the treatment chamber, the drum being configured to spin;
a front ring assembly (44) surrounding the outer periphery of the drum opening to the treatment chamber (18);
a front fascia (20) substantially covering the front ring assembly (44); and
at least one counterweight (46a or 46b) positioned between a front surface of the front ring assembly (44) and the front fascia (20).

2. The laundry treatment machine (10) of claim 1, wherein the at least one counterweight (46a or 46b) is mounted to the front ring assembly (44).
3. The laundry treatment machine (10) of claim 2, wherein the at least one counterweight (46a or 46b) comprises at least one upper counterweight (46a) mounted to an upper portion of the front ring assembly (44) and at least one lower counterweight (46b) mounted to a lower portion of the front ring assembly (44).
4. The laundry treatment machine (10) of claim 1, wherein the at least one counterweight (46a or 46b) is mounted to the fascia (20).
5. The laundry treatment machine (10) of claim 4, wherein the at least one counterweight (46a or 46b) comprises at least one upper counterweight (46a) mounted to an upper portion of the fascia (20) and at least one lower counterweight (46b) mounted to a lower portion of the fascia (20).
6. The laundry treatment machine (10) of any of previous claims, wherein the fascia (20) is made in a single piece.
7. The laundry treatment machine (10) of any of previous claims, further comprising a door (22) connected to the front ring assembly (44) by a hinge (26).
8. The laundry treatment machine (10) of any of previous claims, wherein the tub (28) is suspended within the housing.

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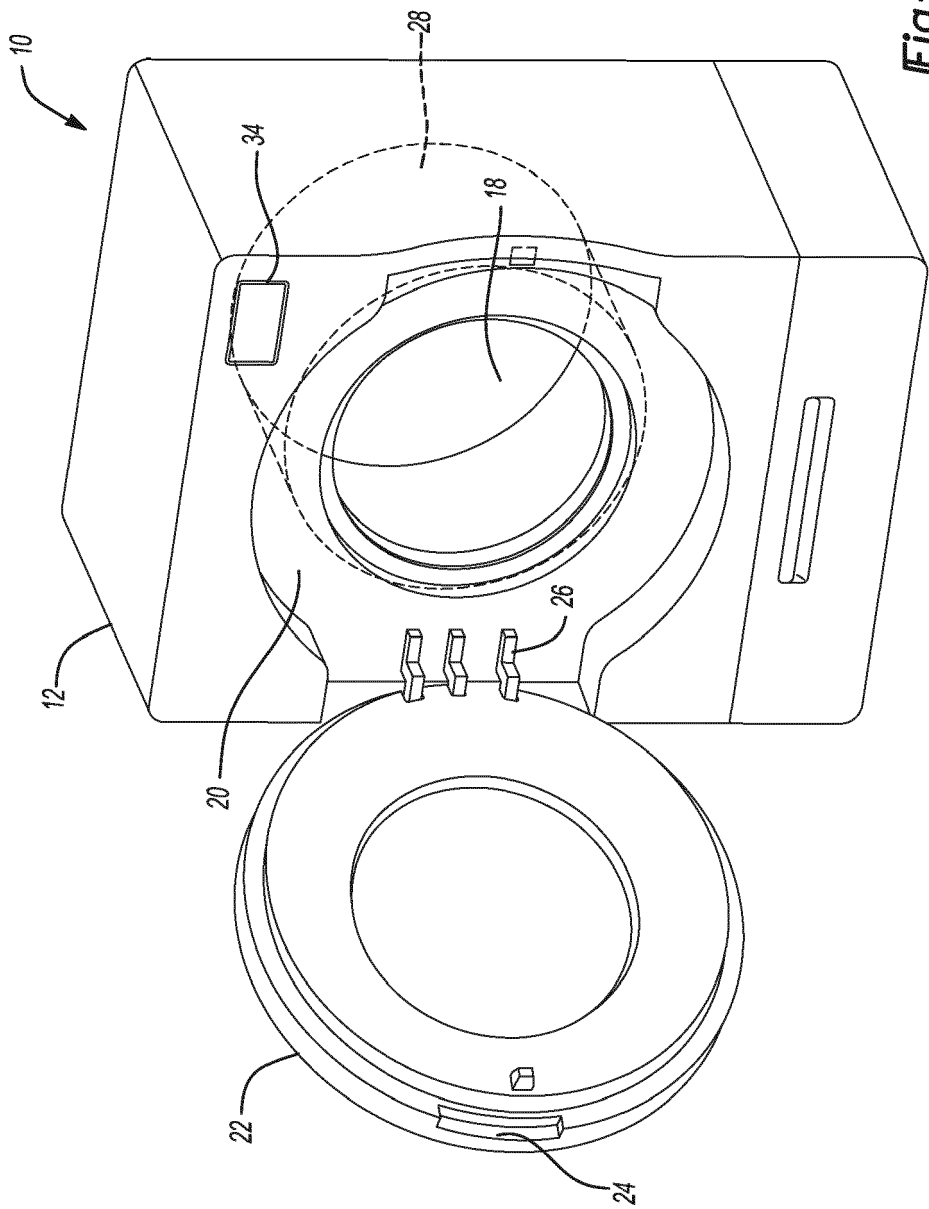


Fig-1

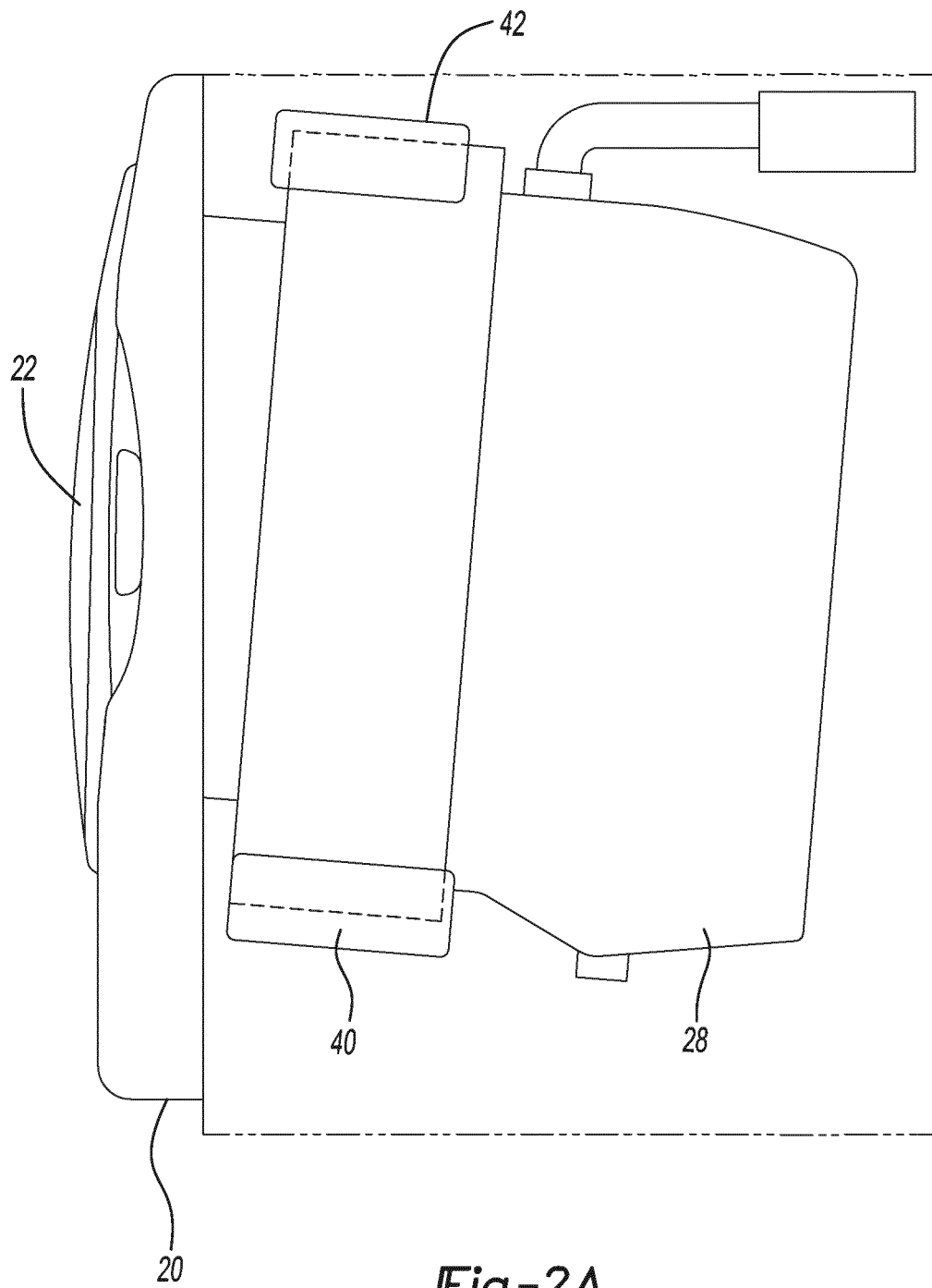


Fig-2A

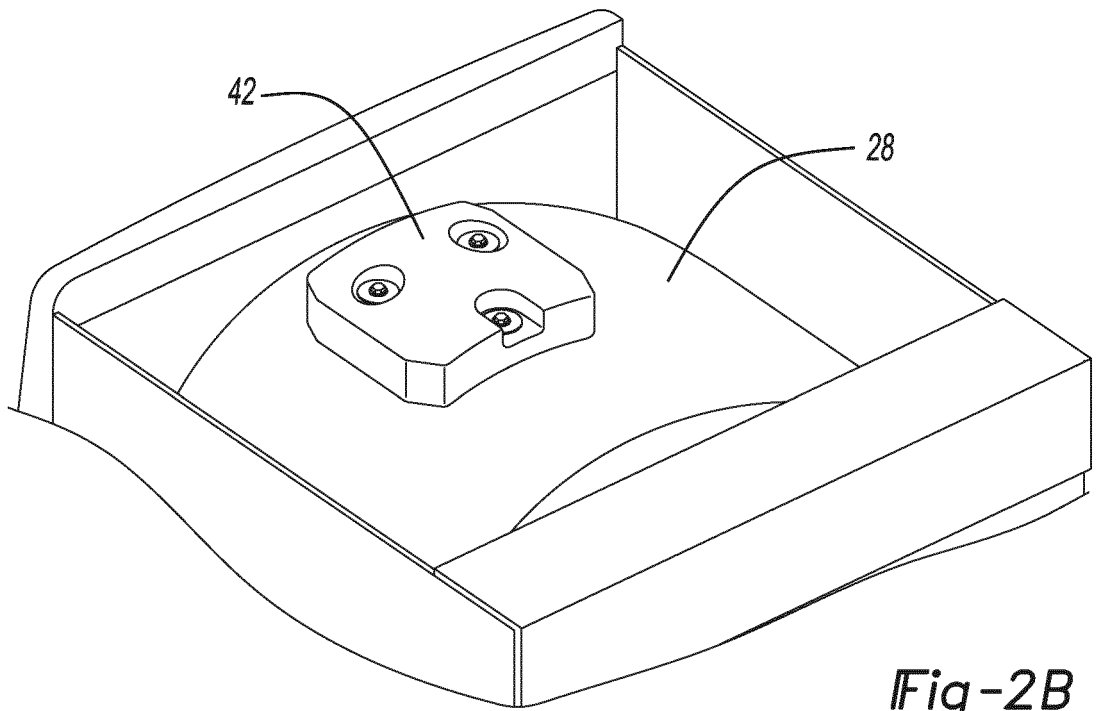


Fig-2B

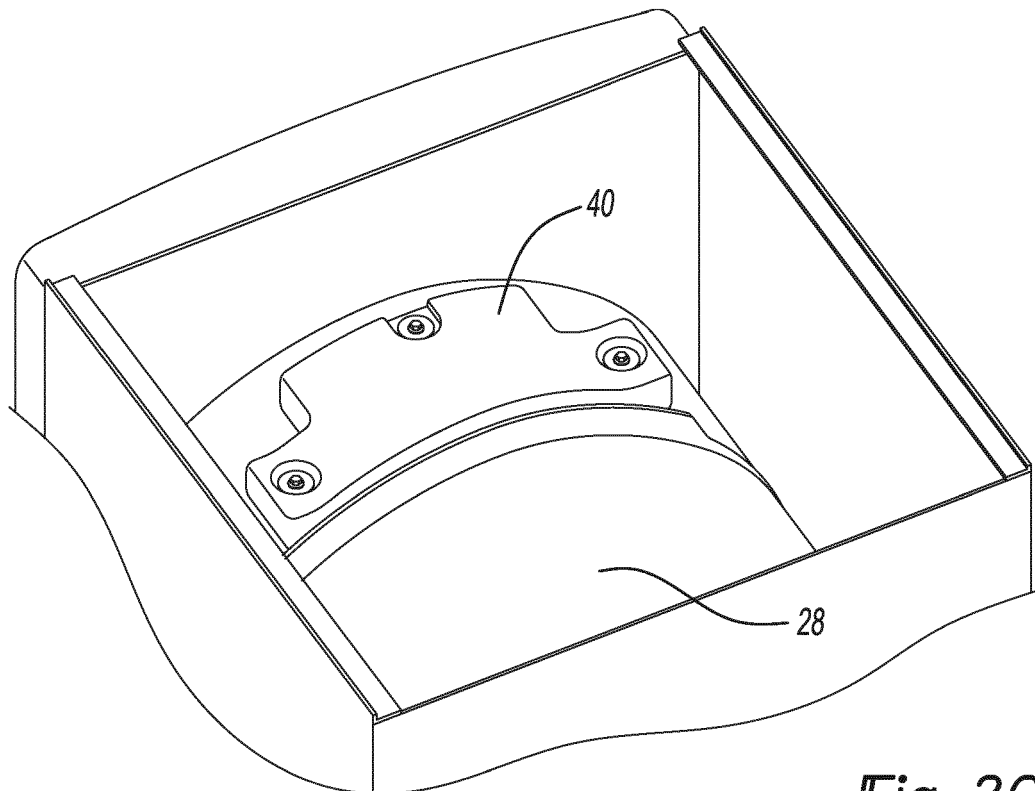


Fig-2C

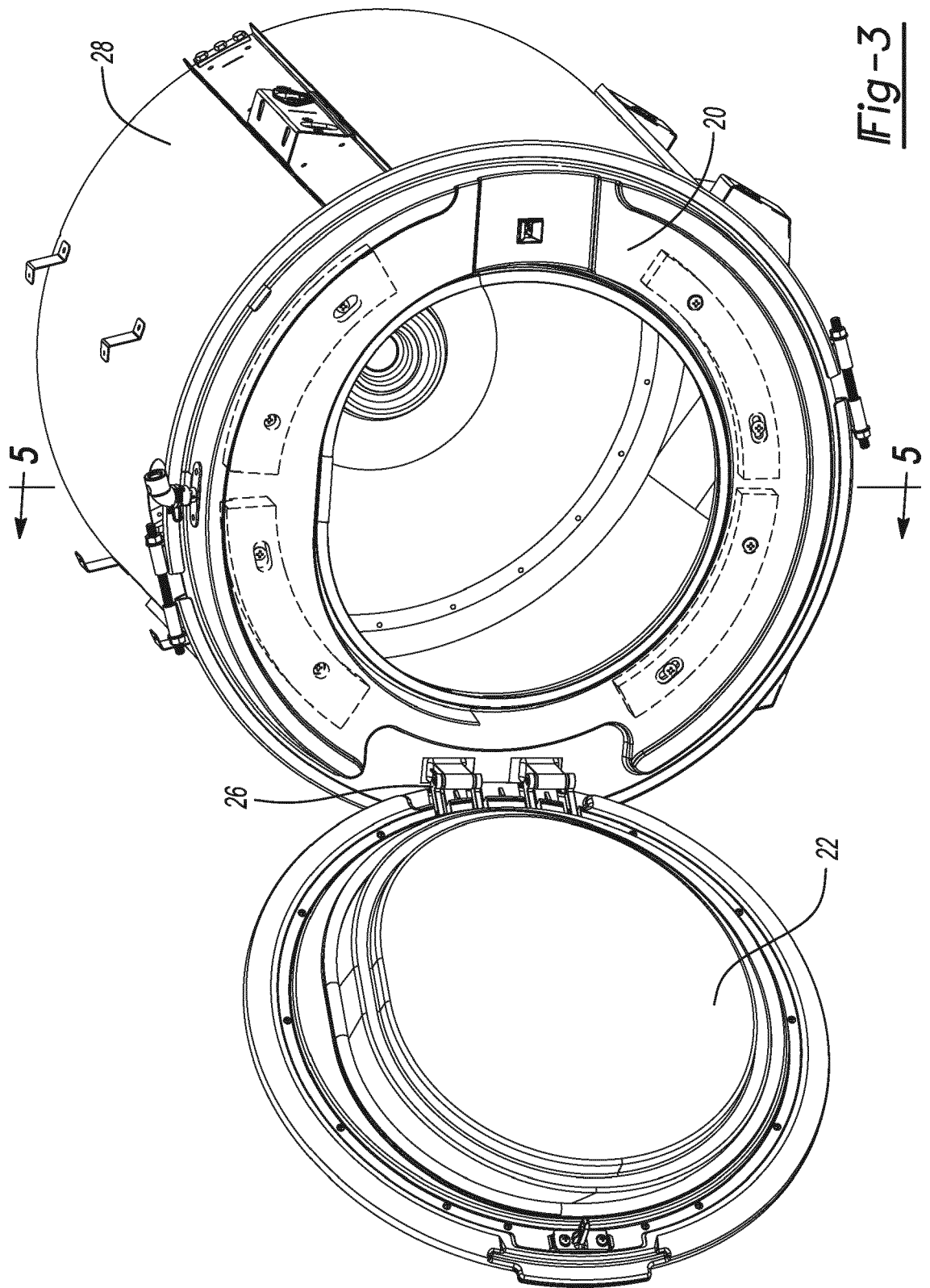


Fig-3

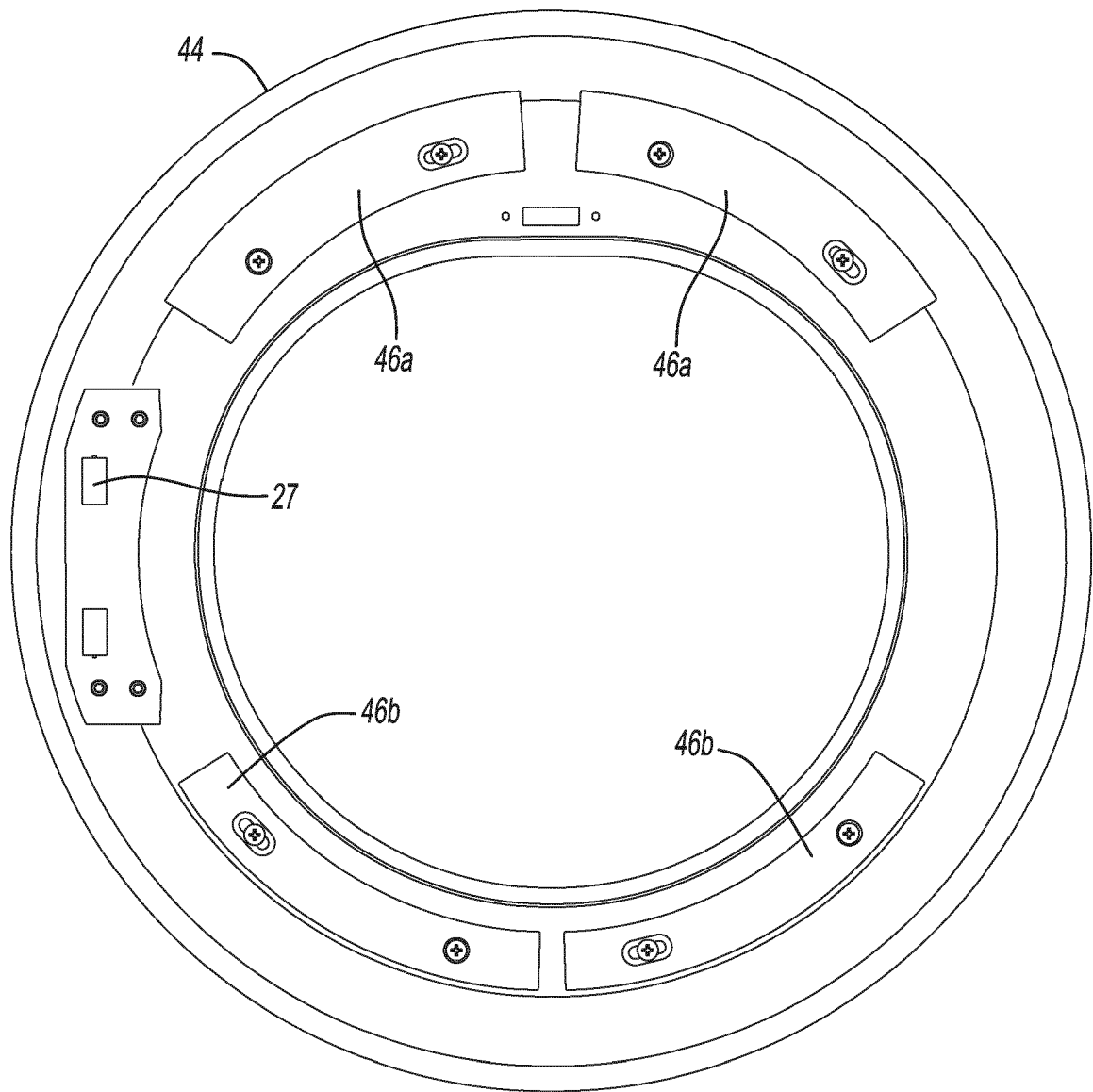


Fig-4

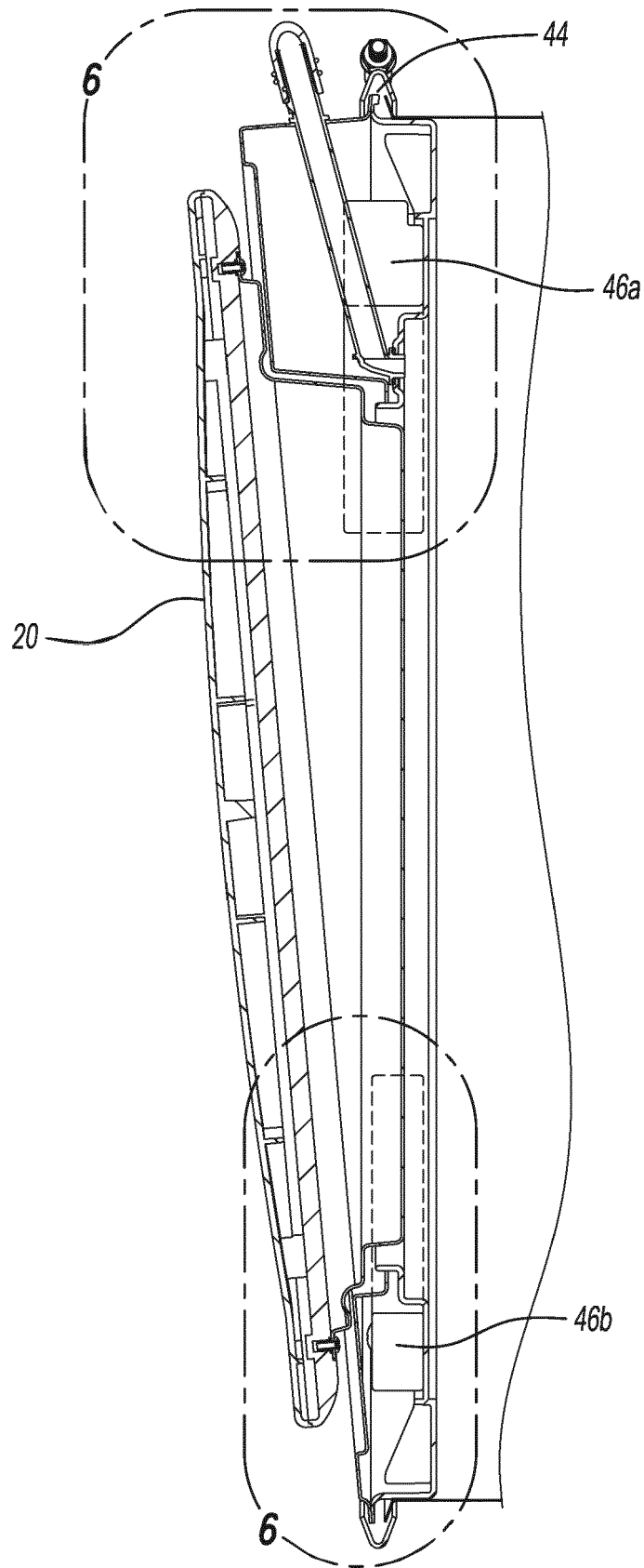


Fig-5

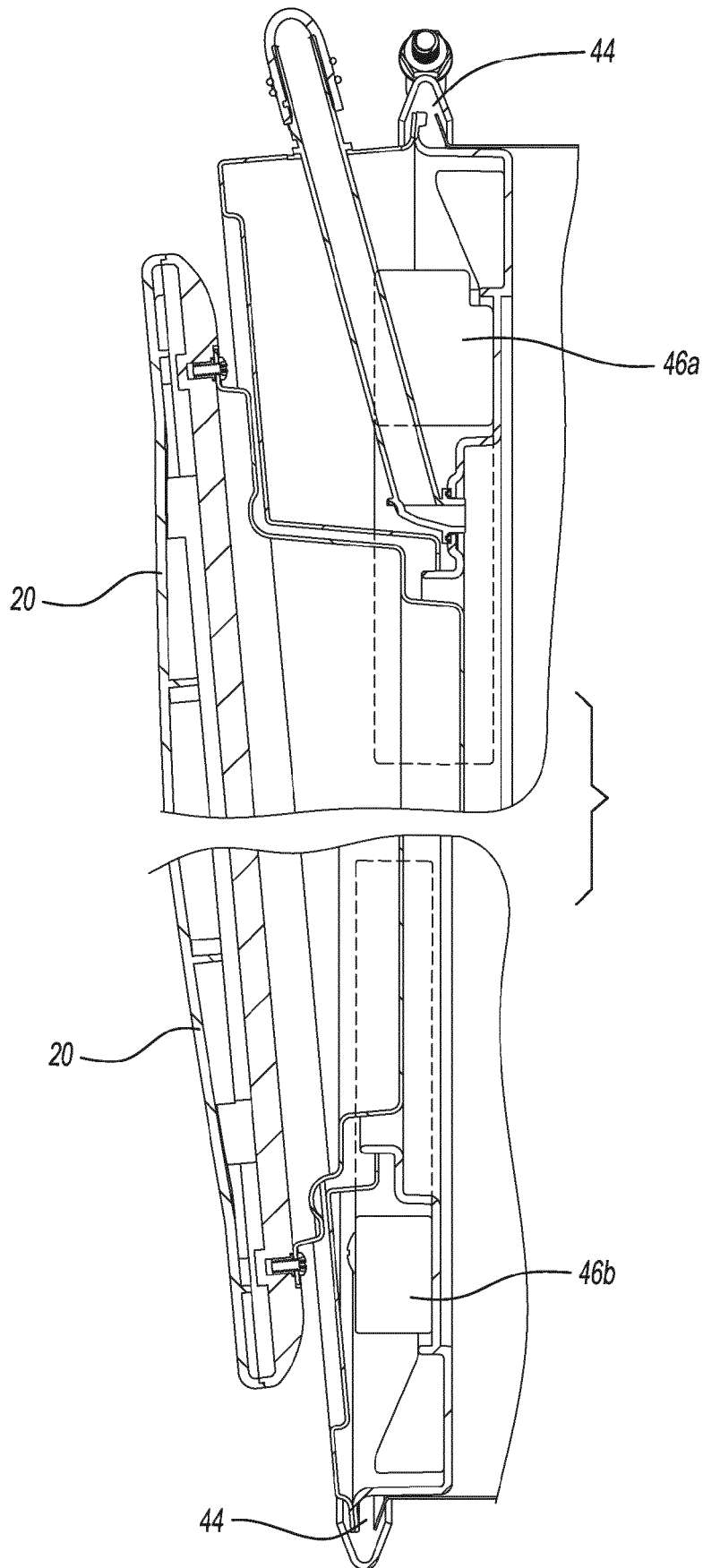


Fig-6



EUROPEAN SEARCH REPORT

Application Number

EP 22 17 0116

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	KR 2006 0114120 A (DAEWOO ELECTRONICS CORP [KR]) 6 November 2006 (2006-11-06) * page 3 - page 4; figures 1-3 * -----	1-8	INV. D06F37/26
X	EP 1 561 852 A1 (ELECTROLUX HOME PROD CORP [BE]) 10 August 2005 (2005-08-10) * paragraph [0015] - paragraph [0020]; figures * -----	1, 4, 6	
X	US 4 519 223 A (WASEMANN WILLIAM A [US]) 28 May 1985 (1985-05-28) * column 5, line 42 - line 65; figure 2 * -----	1	
X	US 2003/041389 A1 (CHEO FRANCIS C [US] ET AL) 6 March 2003 (2003-03-06) * paragraph [0020] - paragraph [0026]; figure 2 * -----	1-8	
X	EP 1 659 203 A1 (ELECTROLUX HOME PROD CORP [BE]) 24 May 2006 (2006-05-24) * paragraph [0019]; figures * -----	1	
X	EP 0 969 134 A1 (SAMSUNG ELECTRONICS CO LTD [KR]) 5 January 2000 (2000-01-05) * figures 1, 4 * -----	1	TECHNICAL FIELDS SEARCHED (IPC) D06F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 5 October 2022	Examiner Diaz y Diaz-Caneja
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 22 17 0116

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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05-10-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 20060114120 A	06-11-2006	NONE	
EP 1561852 A1	10-08-2005	NONE	
US 4519223 A	28-05-1985	NONE	
US 2003041389 A1	06-03-2003	CA 2398597 A1 US 2003041389 A1	05-03-2003 06-03-2003
EP 1659203 A1	24-05-2006	AT 431452 T AU 2005220269 A1 BR PI0505179 A EP 1659203 A1 ES 2325990 T3 JP 2006142034 A PL 1659203 T3 US 2006110236 A1	15-05-2009 08-06-2006 11-07-2006 24-05-2006 28-09-2009 08-06-2006 30-10-2009 25-05-2006
EP 0969134 A1	05-01-2000	EP 0969134 A1 JP 2000024377 A KR 20000007274 A	05-01-2000 25-01-2000 07-02-2000