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(54) **A LAUNDRY WASHING AND/OR DRYING MACHINE**

(57) The present invention relates to a laundry washing and/or drying machine (1) comprising a front wall (3) which has a loading opening thereon; a door (2) which covers the loading opening when closed and which has an inner door (22) facing the front wall (3) and an outer door (21) fixed on the inner door (22); at least one stopper (4) in the form of a protrusion which is disposed on the inner door (22); a cut-out (41) which is provided on the

stopper (4) and which has a mouth (42); and a dampening means (5) which has a main body (51) disposed in the cut-out (41) so as to at least partially remain in the cut-out (41) and a contact area (52) which extends outwards from the mouth (42), which bears against the front wall (3) when the door (2) is closed and which is manufactured from an elastic material.

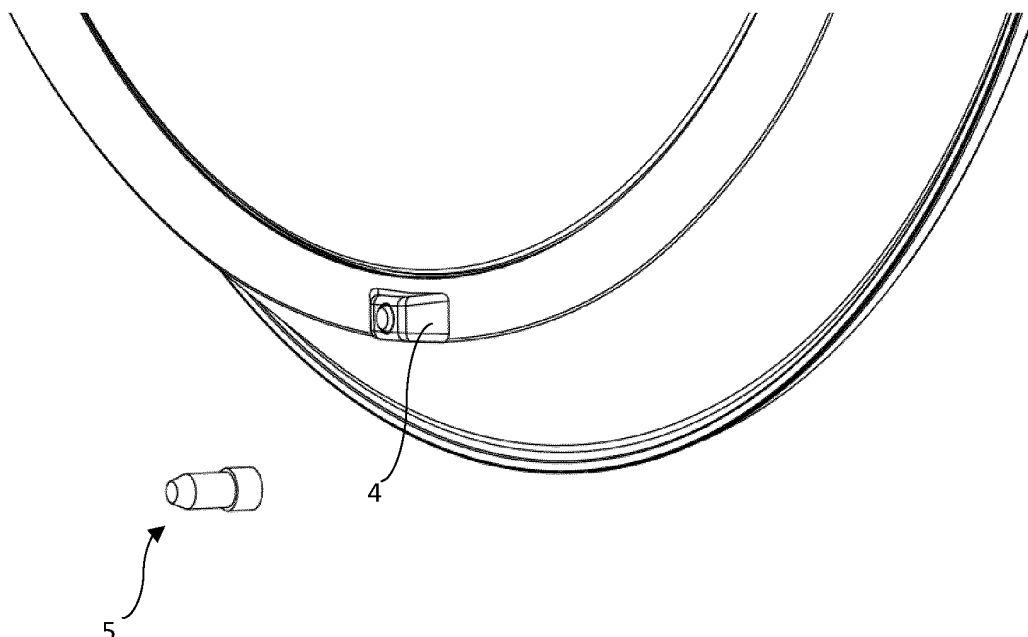


Figure 2a

Description

[0001] The present invention relates to a laundry washing and/or drying machine wherein noise and vibrations caused by the door are decreased.

[0002] When the front door/door group in washing machines and drying machines is closed or in the closed position, the stopper structures in the inner/bottom door area of the front door group and the front wall (sheet metal) contact each other. The stoppers create continuity between the front wall sheet metal and the closed door group and restrict the bending movement of the front cover group due to the laundry loads in the drum/tub. Said stoppers are design details in the form of protrusions on the inner door and manufactured as a single-piece with the inner door from rigid plastic. When the front door group is closed and there is a laundry load, said inner door stoppers contact the front wall sheet metal as a result of the stretching which occurs in the front door group.

[0003] The stopper structures on the inner door stop the stretching of the door by contacting the sheet metal when the door is stretched due to the laundry load, and the sheet metal and plastic start to contact each other. The inner door stopper and the front wall sheet metal which contact each other make noise due to the working vibration of the machine. As a result of the interactions between said inner door stopper(s) and the front wall (sheet material), which contact each other or may contact each other due to the stretching of the door within certain limits, the motor vibrations which occur while the machine is operated and the vibrations generated by dynamic materials cause said contact areas on the front wall and the front door group to generate disturbing sounds due to vibrating/contacting materials. Moreover, the inner door stoppers which contact the front wall make an impact sound, which may be disturbing, when the door is closed quickly, and depending on the magnitude of the impact, the inner door stoppers may crush and deform the front wall sheet metal.

[0004] In the state of the art United States Patent Document No. US2004154351A1, a washing machine is disclosed, comprising members which detect and prevent vibrations.

[0005] The aim of the present invention is the realization of a laundry washing and/or drying machine wherein noise and vibrations caused by the door are decreased.

[0006] Another aim of the present invention is the realization of a laundry washing and/or drying machine wherein the crushing on the front wall due to the cover coming into contact with the front wall, manufactured from sheet metal, is prevented.

[0007] The laundry washing and/or drying machine realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the view of the laundry washing and/or drying machine related to an embodiment of the present invention.

Figure 2a - is the view of the door and the dampening means related to another embodiment of the present invention.

Figure 2b - is the view of the door and the dampening means related to another embodiment of the present invention.

Figure 3 - is the view of the closed state of the door in another embodiment of the present invention.

Figure 4a - is the view of the stopper, the cut-out and the opening related to another embodiment of the present invention.

Figure 4b - is the view of the dampening means in the cut-out related to another embodiment of the present invention.

Figure 5 - is another view of the dampening means and the stopper related to another embodiment of the present invention.

[0008] The elements illustrated in the figures are numbered as follows:

1. Laundry washing and/or drying machine

2. Door

21. Outer door

22. Inner door

3. Front wall

4. Stopper

41. Cut-out

42. Mouth

5. Dampening means

51. Main body

52. Contact area

[0009] The laundry washing and/or drying machine (1) of the present invention comprises a front wall (3) which has a loading opening thereon; a door (2) which covers the loading opening when closed and which has an inner door (12) facing the front wall (3) and an outer door (21) fixed on the inner door (12); at least one stopper (4) in the form of a protrusion which is disposed on the inner door (22); a cut-out (41) which is provided on the stopper (4) and which has a mouth (42); and a dampening means (5) which has a main body (51) disposed in the cut-out

(41) so as to at least partially remain in the cut-out (41) and a contact area (52) which extends outwards from the mouth (42), which bears against the front wall (3) when the door (2) is closed and which is manufactured from an elastic material.

[0010] The laundry washing and/or drying machine (1) of the present invention comprises a loading opening on the front wall (3) which allows the laundry to be washed to be loaded. The door (2) is hinged to the front wall (3) and covers the loading opening when closed. The door (2) is composed of an outer door (21) and an inner door (22). The outer door (21) forms the surface facing the direction the front door (2) opens towards the user. The inner door (22) faces the direction the door (2) is closed towards the inside of the machine (1) where the laundry is placed. When the door (2) is in the closed position, the inner door (22) contacts the front wall (3) of the machine (1). The mouth (41) is provided on one or more than one protrusion-shaped stopper (4) manufactured as a single-piece with the inner door (22) which is the area of the door (2) contacting the front wall (3) of the machine (1) when the door (2) is in the closed position. The mouth (42) provided on the surface of the stopper (4) forms the open area of the cut-out (41), allowing access to the inside of the cut-out (41) from the outside. The dampening means (5) has a main body (51) and a contact area (52). The main body (51) is situated in the cut-out (41). The contact area (52) remains outside the mouth (42). The contact area (52) is manufactured from an elastic material. Since the structure contacting the front wall (3) is the elastic contact zone (52) instead of the stopper (4), the contact between the stopper (4), which is usually manufactured from hard plastic, and the sheet metal is eliminated, thus preventing the noise caused by vibration.

[0011] In a preferred embodiment of the present invention, the dampening means (5) comprises the main body (51) which has a form suitable for the cut-out (41) so as to fit into the cut-out (41) almost without any gap, and the contact zone (52) which is manufactured as a single-piece with the main body (51) so as to form the part of the main body (51) extending outside the stopper (4) through the mouth (41). The contact area (52) extends out of the mouth (42) as a continuation of the main body (51). The main body (51) of the dampening means (5) is sized so as to be placed in the cut-out (41) without leaving any empty volume in the cut-out (41). In this embodiment of the present invention, when the main body (51) is placed into the cut-out (41), the contact area (52) extends out of the mouth (42). The size and/or flexibility of the contact zone (52) is determined according to the required distance and dampening ratio. In this embodiment of the present invention, the dampening means (5) is grouped with the inner door (22) from the inside via the grouping housing.

[0012] In another preferred embodiment of the present invention, the dampening means (5) comprises the contact zone (52) which has a width larger than the width of the mouth (42) so as not to enter the cut-out (41) through

the mouth (42) (Figure 2b). The main body (51) of the dampening means (5) is manufactured in such a size and/or flexibility so as to enter through the mouth (42) and remain fixed in the cut-out (41) by not moving in the direction opposite to the entry direction unless an additional force is applied. The contact area (52) is manufactured so as not to enter the cut-out (41) through the mouth (42), in other words, the mouth (42) is larger. The dampening means (5) is grouped with the inner door (22) from the outside.

[0013] In another preferred embodiment of the present invention, the dampening means (5) is manufactured from an elastic material. In this embodiment of the present invention, the entire dampening means (5), that is the main body (51) and the contact zone (52), is manufactured from an elastic material, thus increasing the vibration dampening performance of the dampening means (5).

Claims

1. A laundry washing and/or drying machine (1) comprising a front wall (3) which has a loading opening thereon; a door (2) which covers the loading opening when closed and which has an inner door (12) facing the front wall (3) and an outer door (21) fixed on the inner door (12); and at least one stopper (4) in the form of a protrusion which is disposed on the inner door (22), **characterized by** a cut-out (41) which is provided on the stopper (4) and which has a mouth (42); and a dampening means (5) which has a main body (51) disposed in the cut-out (41) so as to at least partially remain in the cut-out (41) and a contact area (52) which extends outwards from the mouth (42), which bears against the front wall (3) when the door (2) is closed and which is manufactured from an elastic material.
2. A laundry washing and/or drying machine (1) as in Claim 1, **characterized by** the dampening means (5) comprising the main body (51) which has a form suitable for the cut-out (41) so as to fit into the cut-out (41) almost without any gap, and the contact zone (52) which is manufactured as a single-piece with the main body (51) so as to form the part of the main body (51) extending outside the stopper (4) through the mouth (41).
3. A laundry washing and/or drying machine (1) as in Claim 1, **characterized by** the dampening means (5) comprising the contact zone (52) which has a width larger than the width of the mouth (42) so as not to enter the cut-out (41) through the mouth (42).
4. A laundry washing and/or drying machine (1) as in any one of the above claims, **characterized by** the dampening means (5) which is manufactured from

an elastic material.

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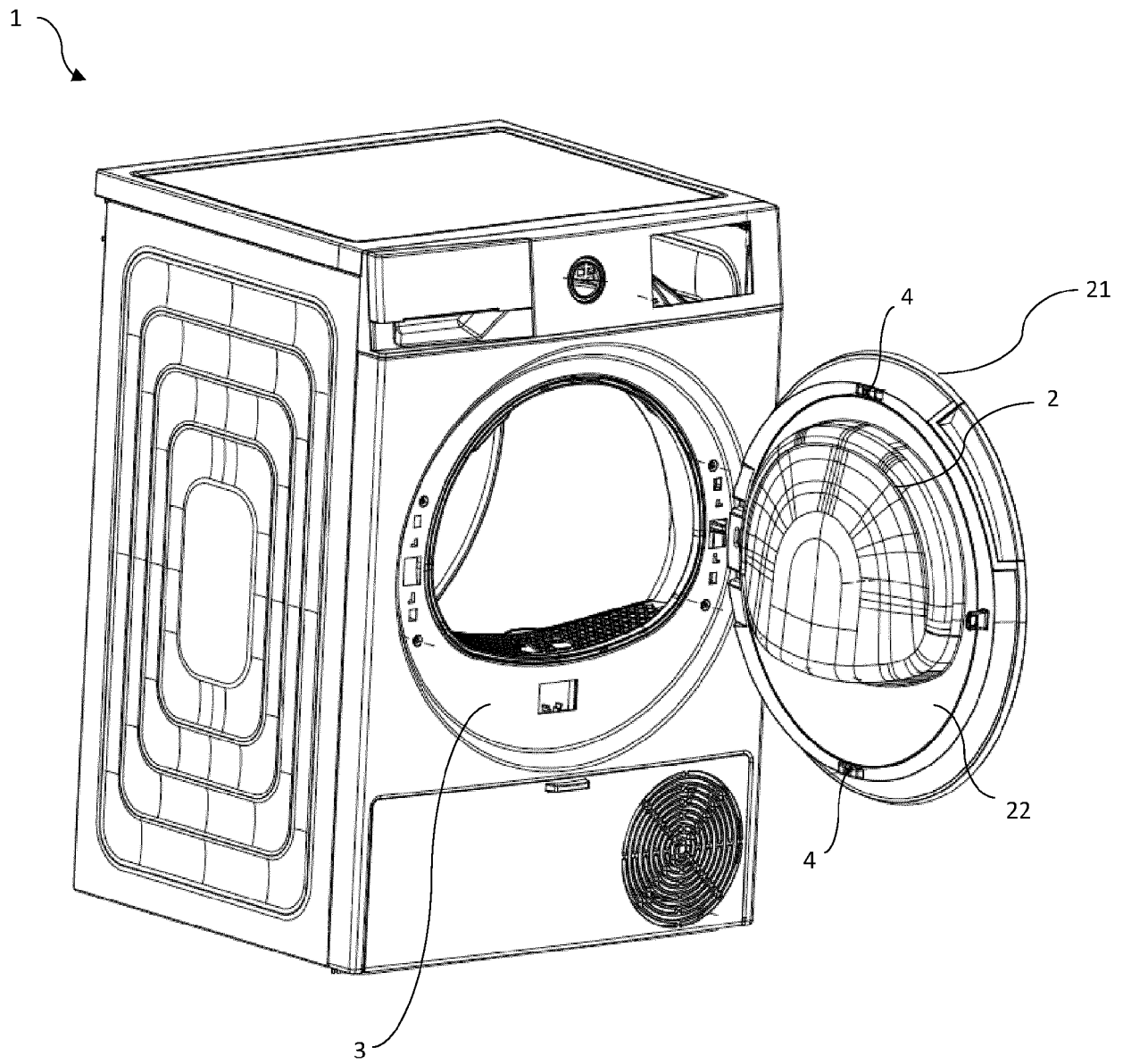


Figure 1

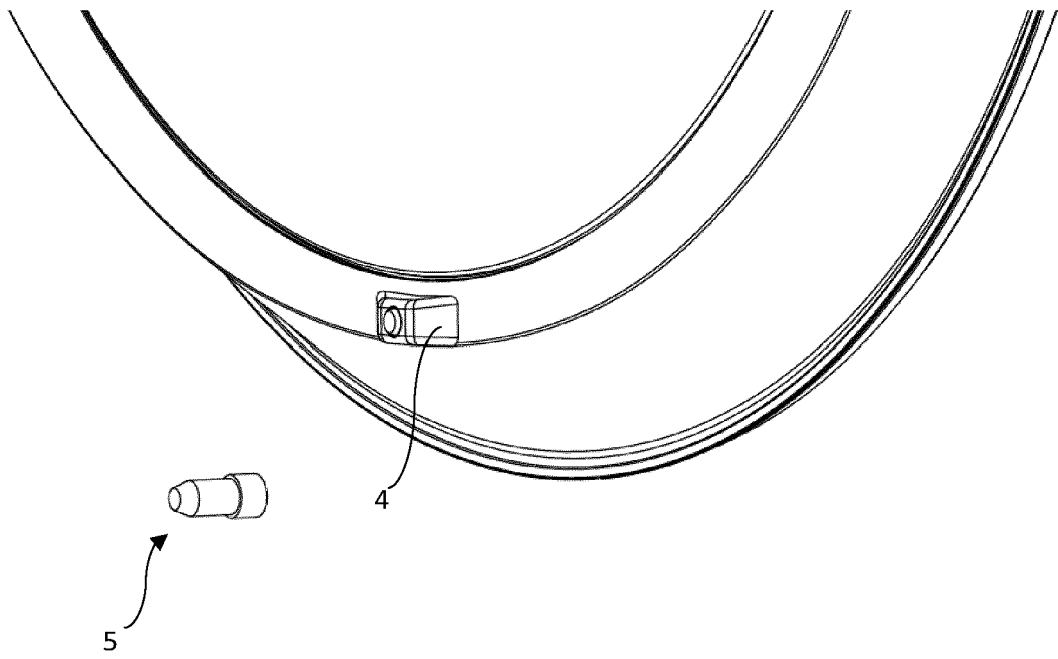


Figure 2a

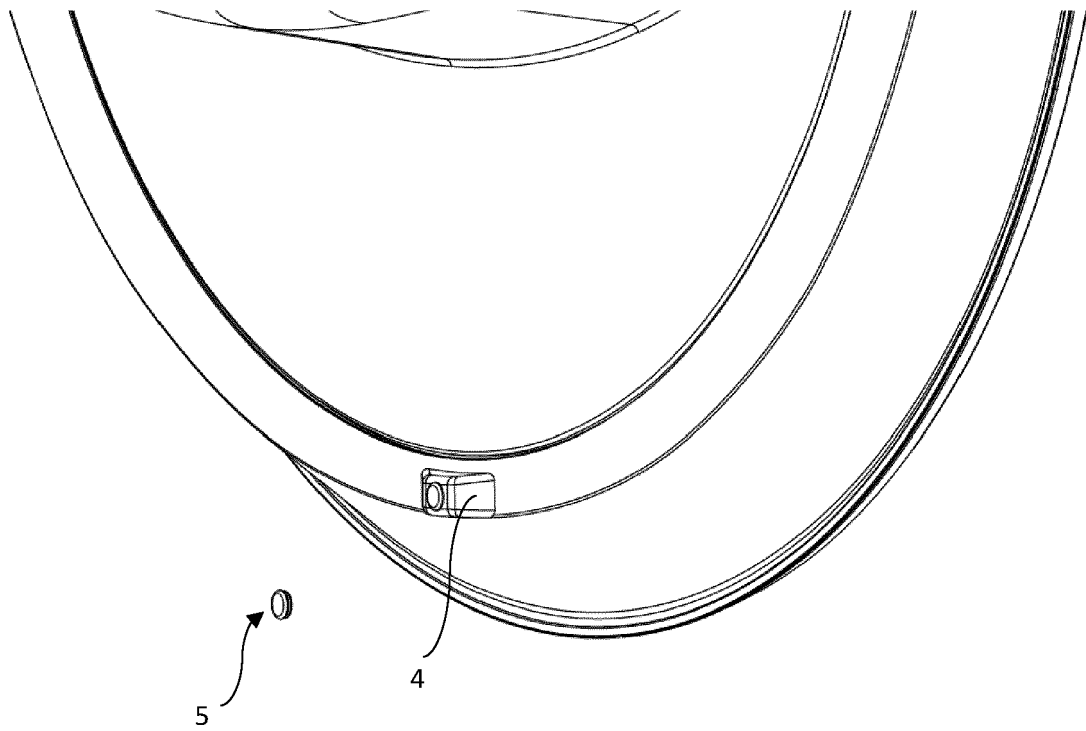


Figure 2b

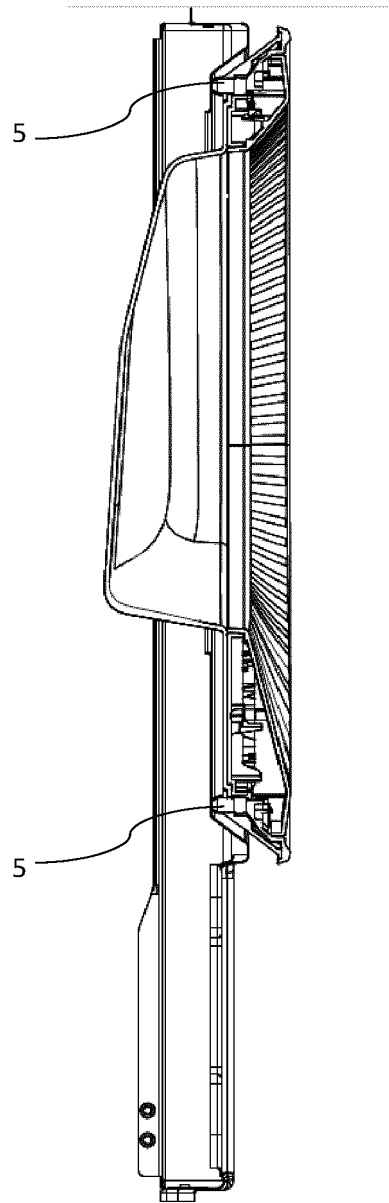


Figure 3

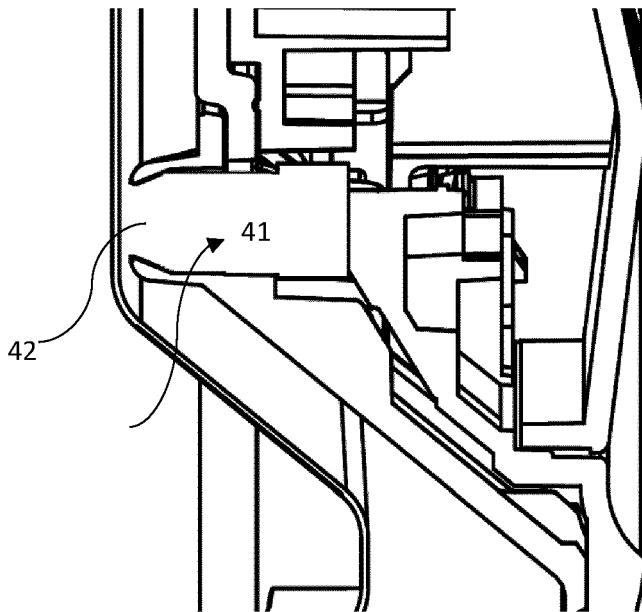


Figure 4a

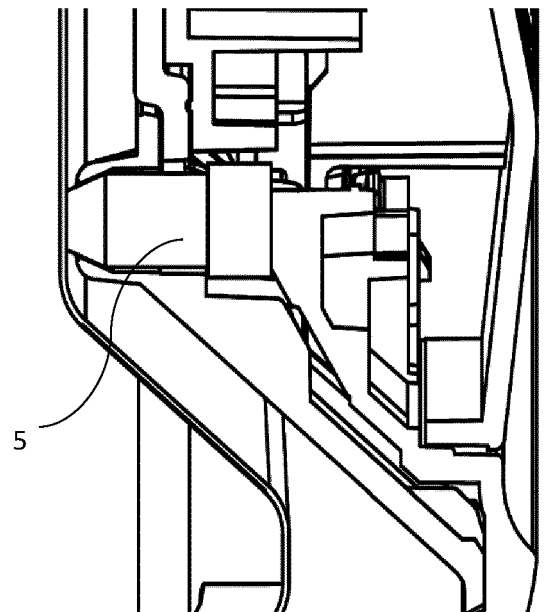


Figure 4b

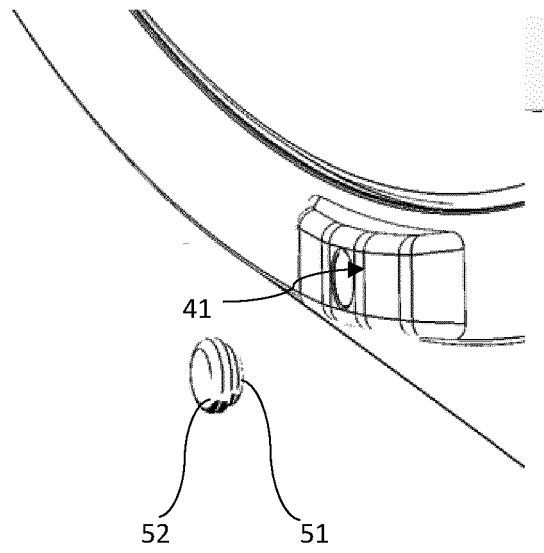
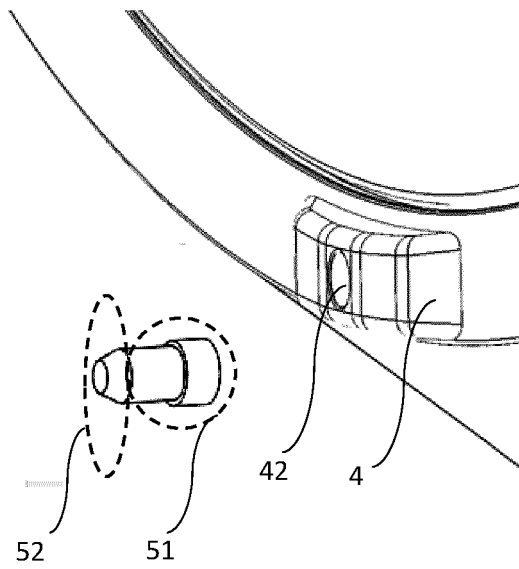


Figure 5



EUROPEAN SEARCH REPORT

Application Number

EP 22 21 0241

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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)
A	EP 3 690 125 A1 (LG ELECTRONICS INC [KR]) 5 August 2020 (2020-08-05) * paragraphs [0088] - [0113] * * paragraphs [0236] - [0239] * * figures 1-3, 9, 10 *	1-4	INV. D06F39/14
A	WO 2011/014018 A2 (LG ELECTRONICS INC [KR]; KWAK DAE WOOK [KR] ET AL.) 3 February 2011 (2011-02-03) * paragraphs [0039] - [0043] * * paragraphs [0049] - [0059] * * figures 1-6 *	1	
A	WO 2018/188929 A1 (ARCELIK AS [TR]) 18 October 2018 (2018-10-18) * paragraphs [0023] - [0025] * * figures 1-4 *	1	
A	CN 111 254 662 A (QINGDAO HAIER WASHING MACH CO; HAIER SMART HOME CO LTD) 9 June 2020 (2020-06-09) * paragraphs [0057] - [0067] * * figures 1-4 *	1	TECHNICAL FIELDS SEARCHED (IPC) D06F
A	WO 2018/121938 A1 (ARCELIK AS [TR]) 5 July 2018 (2018-07-05) * paragraphs [0012] - [0015] * * figures 1-3 *	1	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 25 May 2023	Examiner Weidner, Maximilian
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	

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ON EUROPEAN PATENT APPLICATION NO.**

EP 22 21 0241

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 3690125 A1	05-08-2020	AU 2020200534 A1	20-08-2020
		CN 111519408 A	11-08-2020
		EP 3690125 A1	05-08-2020
WO 2011014018 A2	03-02-2011	CN 102428225 A	25-04-2012
		EP 2459793 A2	06-06-2012
		US 2012056518 A1	08-03-2012
		WO 2011014018 A2	03-02-2011
WO 2018188929 A1	18-10-2018	EP 3610063 A1	19-02-2020
		WO 2018188929 A1	18-10-2018
CN 111254662 A	09-06-2020	NONE	
WO 2018121938 A1	05-07-2018	TR 201619701 A2	23-07-2018
		WO 2018121938 A1	05-07-2018

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 2004154351 A1 [0004]