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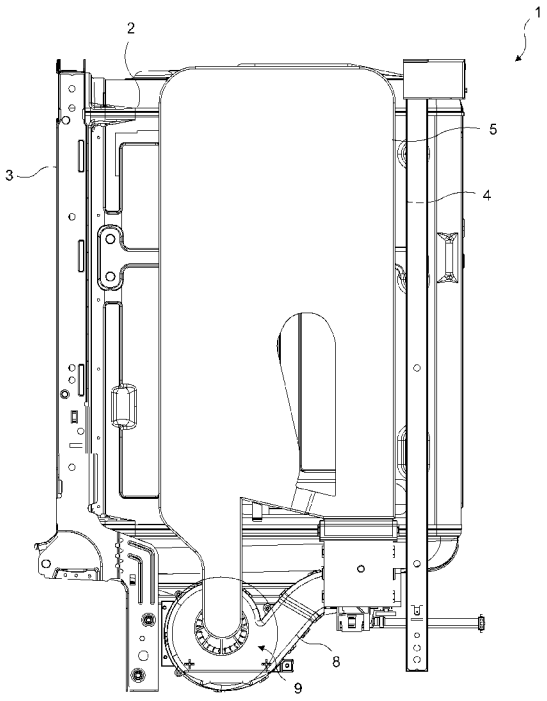
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(54) Title: A DISHWASHER COMPRISING A FAN POCKET

Figure 1



(57) Abstract: The present invention relates to a dishwasher (1) comprising a tub (2) wherein the items to be washed are placed; a body (3) which encloses the tub (2) and which has two side walls (4); a fan pocket (5) which is provided between the tub (2) and the body (3); a fan (9) which is disposed on the fan pocket (5) and which sucks the air in the tub (2) into the fan pocket (5); a channel (8) which has an inlet (6) for receiving the air in the tub (2) into the fan pocket (5) and an outlet (7) for delivering the air, which passes through the inlet (6), back into the tub (2); a shutter (10) which is positioned on the inlet (6) and the outlet (7); and a connection member (11) which is attached onto the shutter (10) and which enables the shutter (10) to be mounted and the position thereof to be controlled.

WO 2020/120032 A1

Description

A DISHWASHER COMPRISING A FAN POCKET

[0001] The present invention relates to a dishwasher comprising a fan pocket provided on the body.

[0002] In the dishwasher programs, the drying step starts after the washing and rinsing steps. In the drying step, the aim is to remove the water remaining on the dishes and also to prevent the moisture in the tub from condensing and leaving stains on the dishes which start to cool down after the rinsing step. In order to easily remove the water remaining on the dishes in the drying step, the last rinsing step is carried out with hot water. This results in consuming a large amount of energy while heating the water. In the drying step after the hot rinsing step, the humid air in the tub passes through a channel arranged on the tub wall. The air circulated through the channel by means of a fan contacts the surfaces of the channel which are cooler than the interior of the tub, and thus some of the moisture in the air is condensed. However, the moisture in the tub cannot be completely removed and the moisture remaining at the end of the drying step causes stains on the washed dishes.

[0003] Various connection members are used to integrate the fan pocket to the dishwasher, and various regions, holes, embossments, etc. are formed on the body of the dishwasher. The regions where the connection members joint the dishwasher body with the fan pocket must be in the form of cut-outs or must be completely formed by hollowed structures in order to ensure the circulation of the air. Due to said structures, some of the dishwasher noise may leak to the outside during the washing step. The high-pressure water leaving the spray arm nozzles during the washing step may flow towards the fan pocket via the cut-outs. This may cause losses in the washing water. Moreover, the high-pressure water may hit the walls of the fan pocket, adversely affecting the noise level.

[0004] In the state of the Korean Patent Application No. KR20050014516, a dishwasher is disclosed, wherein the drying performance is improved by means of the condensation formed by joining the hot air drawn from inside the tub with the cold water received from the outer environment.

[0005] Another state of the art embodiment is explained in the German Patent Application No. DE10013416. In this embodiment, a dishwasher is realized, comprising an air circulation system wherein the hot air is cooled down and condensed.

[0006] The aim of the present invention is the realization of a dishwasher with improved drying efficiency.

[0007] The dishwasher realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a shutter which is positioned on the inlet and the outlet arranged on the tub, and a connection member which provides the connection and control of the shutter. The openable/closable narrow shutter which extends in the horizontal plane is produced from wood, plastic or metal material and attached to the inlet and the outlet.

[0008] By means of the present invention, the shutter and the connection member prevent the high-pressure water delivered by the spray arms of the dishwasher from flowing towards the fan pocket. Thus, possible washing water losses and impact-induced noise formation are prevented.

[0009] In an embodiment of the present invention, the connection member and the shutter are fixed to each other.

[0010] In another embodiment of the present invention, the connection member and the shutter are produced as a single piece.

[0011] In yet another embodiment of the present invention, the dishwasher comprises a pusher which controls and adjusts the open/closed position of the shutter, and a spring which enables the shutter to be kept stationary at the position thereof.

[0012] The shutter is shifted to the closed position in the washing step while being changed to the open position in the drying step. In the preferred embodiment of the present invention, the shutter is adjusted so as to be positioned at 45 degrees.

[0013] In the preferred embodiment of the present invention, the component used as the pusher is a thermal pusher.

[0014] By means of the present invention, the air is efficiently guided, thus improving the drying performance. Moreover, washing water losses are

prevented, thus improving the washing performance. Furthermore, noise which may occur due to impact of high-pressure water is prevented.

[0015] A dishwasher realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

[0016] Figure 1 - is the sideways view of a dishwasher.

[0017] Figure 2 - is the top perspective view of the shutter and the connection member.

[0018] Figure 3 - is the sideways perspective view of the shutter and the connection member.

[0019] Figure 4 - is the sideways view of the fan pocket.

[0020] Figure 5 - is the perspective view of the fan pocket.

[0021] The elements illustrated in the figures are numbered as follows:

1. Dishwasher
2. Tub
3. Body
4. Side wall
5. Fan pocket
6. Inlet
7. Outlet
8. Channel
9. Fan
10. Shutter
11. Connection member

[0022] The dishwasher (1) comprises a tub (2) wherein the items to be washed are placed; a body (3) which encloses the tub (2) and which has two side walls (4); a fan pocket (5) which is provided between the tub (2) and the body (3); a fan (9) which is disposed on the fan pocket (5) and which sucks the air in the tub (2) into the fan pocket (5); a channel (8) which has an inlet (6) for receiving the air in the tub (2) into the fan pocket (5) and an outlet (7) for delivering the air, which passes through the inlet (6), back into the tub (2); a shutter (10) which is positioned on the inlet (6) and the outlet (7); and a connection member (11) which is attached onto the shutter (10) and which enables the shutter (10) to be mounted and the position thereof

to be controlled (Figure 1, Figure 2 and Figure 3).

[0023] In the dishwasher (1) wherein the drying process is carried out by means of the fan (9), the inlet (6) and the outlet (7) are provided in the tub (2). By using said inlet (6) and outlet (7), the steam forming at the end of the washing process due to the hot water in the dishwasher (1) can be guided, discharged, etc. In the drying step, the humid, hot air is drawn from the dishwasher (1) through the inlet (6) to be sucked into the fan pocket (5) by the fan (9) and then mixed with the outer environment air so as to be discharged or transferred back into the dishwasher (1) through the outlet (7). The fan pocket (5) is connected to the body (3) and the tub (2) by means of the connection member (11). The connection member (11) is used both for keeping the structure together and for providing leak-proofing. By means of the shutter (10) joined with the connection member (11), the high-pressure water delivered by the spray arms during the washing step is prevented from passing through the inlet (6) and the outlet (7) and entering the fan pocket (5). In this case, the problems such as noise formation due to the water delivered by the spray arms hitting the preferably plastic walls of the fan pocket (5) and losses in washing water are eliminated (Figure 4 and Figure 5).

[0024] In an embodiment of the present invention, the shutter (10) and the connection member (11) are fixed to each other. The shutter (10) is positioned so as to be just behind the connection member (11).

[0025] In another embodiment of the present invention, the shutter (10) and the connection member (11) are produced as a single piece.

[0026] In another embodiment of the present invention, the dishwasher (1) comprises a pusher which enables the shutter (10) to be opened/closed or to remain at a certain angle, and a spring which is disposed on the pusher and which enables the shutter (10) to be kept in position unless a force is applied on the pusher.

[0027] In this embodiment, the shutter (10) is closed during the washing step and the washing water is prevented from leaking into the fan pocket (5) through the inlet (6) and the outlet (7). In this case, the shutter (10) is in the closed position in the vertical plane. Since the high-pressure water in

the tub (2) cannot enter the fan pocket (5) by means of the shutter (10), the noise formation due to impact against the channel (8) walls is eliminated. Moreover, water leaks into the fan pocket (5) through the inlet (6) and the outlet (7) are also prevented.

[0028] When the dishwasher (1) starts the drying step, the pusher is energized and a force is applied onto the pusher, thus overcoming the force of the spring and opening the shutter (10). By adjusting the length of the pusher, the angle and the gaps in the shutter (10) can be determined. The shutter (10) is shifted to the open position by being set at the angle determined by the producer, thus allowing the circulation of air. When the air inside the dishwasher (1) is desired to be discharged outside, the shutter (10) is shifted to the predetermined angle and the air sucked from the tub (2) is enabled to pass through the shutter (10) and directly enter the fan pocket (5) and the channel (8) therein. The structure of the shutter (10) prevents the formation of chaotic air flow, thus contributing the lamination of the air and increasing the suction efficiency.

[0029] Moreover, in the dishwasher (1), when the air is desired to be delivered into the tub (2), the shutter (10) ensures that the air flow is directed towards the tub (2). Thus, the air dryer than the air in the tub (2) is directly guided to the tub (2), improving the drying efficiency.

[0030] In the preferred embodiment of the present invention, the shutter (10) is positioned with an angle of 45 degrees. Thus, the delivery of the sucked air directly to the channel (8) is facilitated, increasing the suction efficiency. In this embodiment of the present invention, the shutter (10) on the outlet (7) is also positioned with an angle of 45 degrees. Thus, the air to be blown into the tub (2) is enabled to be guided onto the lower rack so as to be delivered directly onto the dishes, improving the drying efficiency.

[0031] In an embodiment of the present invention, the pusher is a thermal pusher.

[0032] By means of the present invention, the air low is laminated, thus decreasing the effect of sudden expansion on the air flow. By preventing the chaotic air flow due to failure to disperse because of the effect of sudden expansion, the air with high moisture retaining capacity reaches the dishes with the guidance of the shutter (10).

Claims

1. A dishwasher (1) **comprising** a tub (2) wherein the items to be washed are placed; a body (3) which encloses the tub (2) and which has two side walls (4); a fan pocket (5) which is provided between the tub (2) and the body (3); a fan (9) which is disposed on the fan pocket (5) and which sucks the air in the tub (2) into the fan pocket (5); a channel (8) which has an inlet (6) for receiving the air in the tub (2) into the fan pocket (5) and an outlet (7) for delivering the air, which passes through the inlet (6), back into the tub (2), **characterized by** a shutter (10) which is positioned on the inlet (6) and the outlet (7); and a connection member (11) which is attached onto the shutter (10) and which enables the shutter (10) to be mounted and the position thereof to be controlled.
2. A dishwasher (1) as in Claim 1, **characterized by** the shutter (10) and the connection member (11) which are fixed to each other.
3. A dishwasher (1) as in Claim 1 or 2, **characterized by** the shutter (10) which is positioned so as to remain just behind the connection member (11).
4. A dishwasher (1) as in Claims 1 to 3, **characterized by** the shutter (10) and the connection member (11) which are produced as a single piece.
5. A dishwasher (1) as in Claim 1, **characterized by** a pusher which enables the shutter (10) to be opened/closed or to remain at a certain angle, and a spring which is disposed on the pusher and which enables the shutter (10) to be kept in position unless a force is applied on the pusher.
6. A dishwasher (1) as in any one of the above claims, **characterized by** the shutter (10) which is positioned in the vertical plane in the closed position.
7. A dishwasher (1) as in any one of the above claims, **characterized by** the shutter (10) which is positioned at an angle of 45 degrees in the open position.
8. A dishwasher (1) as in Claim 5, **characterized by** the pusher which is a thermal pusher.

Figure 1

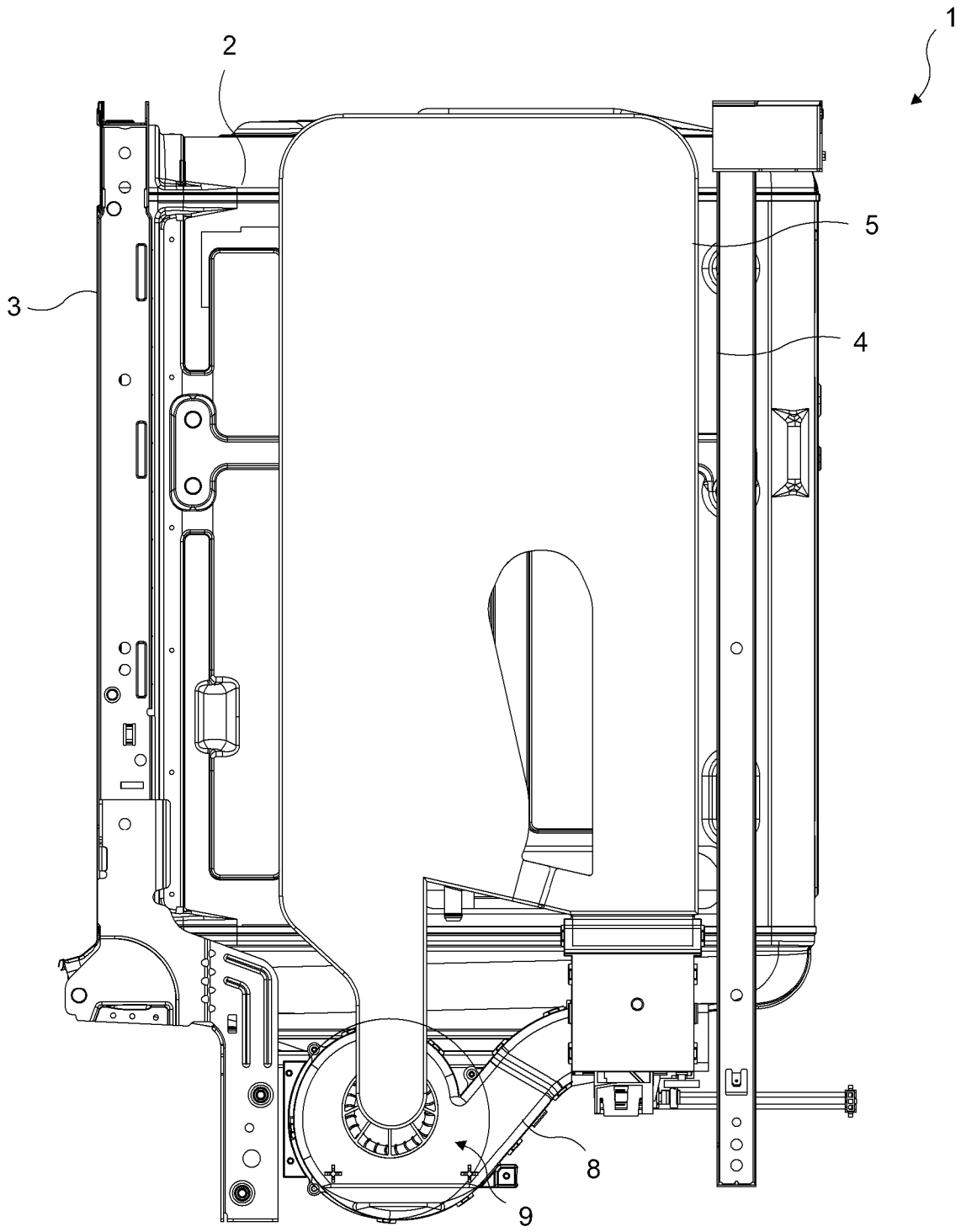


Figure 2

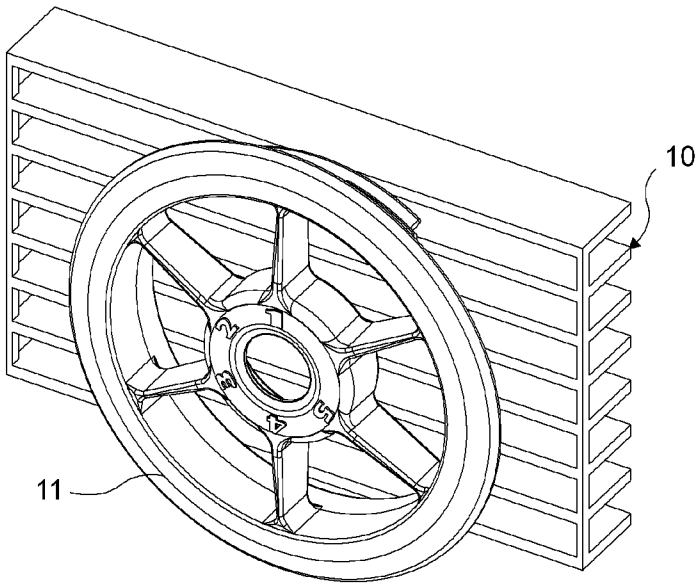


Figure 3

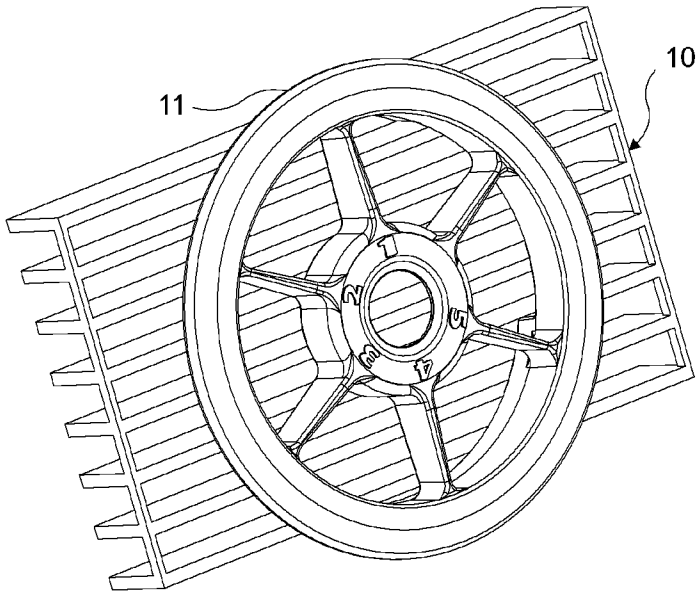


Figure 4

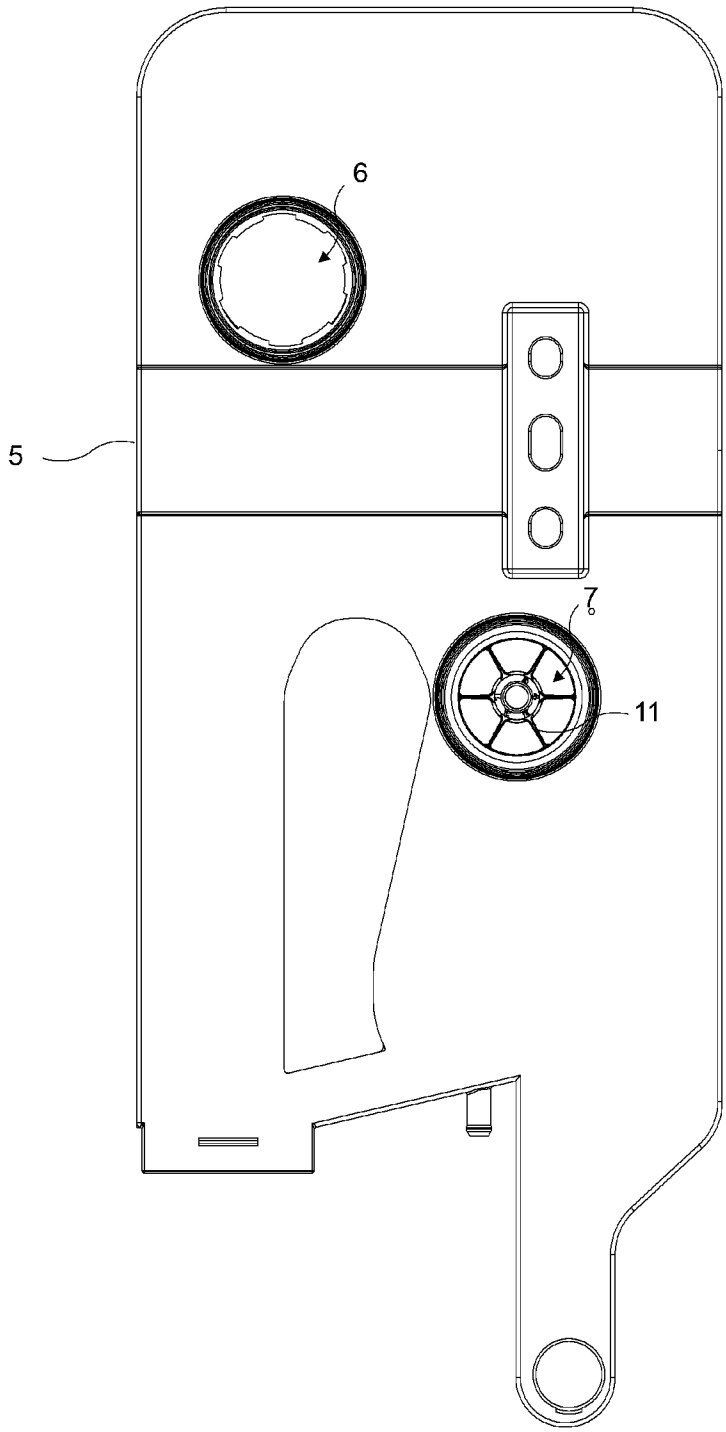
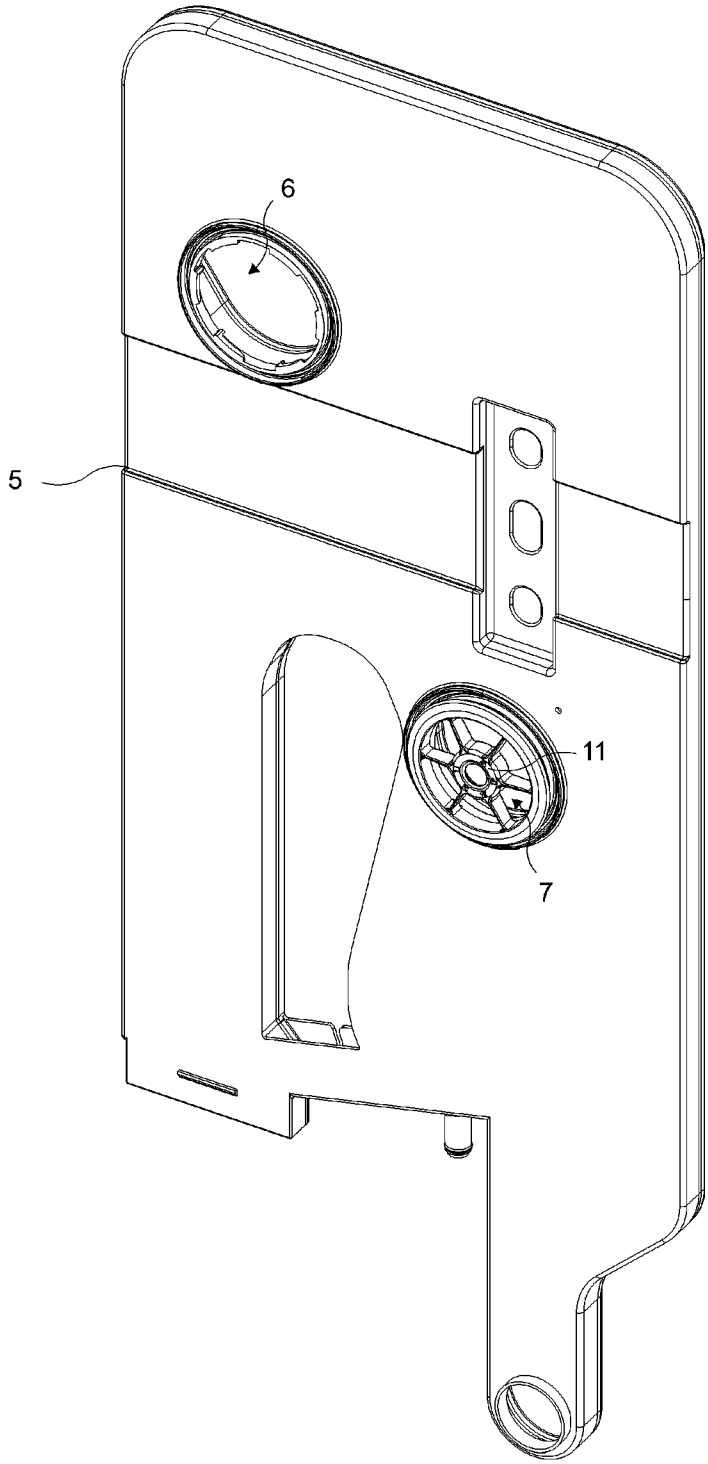


Figure 5



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2019/080057

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47L15/48
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A47L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/074154 A1 (ELTEK SPA [IT]; CERRUTI DANIELE [IT]) 26 September 2002 (2002-09-26) page 1, lines 13-25 page 3, line 25 - page 10, line 30; figures 1-7	1-8
A	KR 2012 0112993 A (TONGYANG INC [KR]) 12 October 2012 (2012-10-12) paragraphs [[0014]] - [[0034]]; figures 1-2b	1-8
A	DE 197 04 430 A1 (WHIRLPOOL CO [US]) 13 August 1998 (1998-08-13) column 3, lines 32-38; figures 2,3	1-8

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
19 December 2019	10/01/2020

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Lodato, Alessandra

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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