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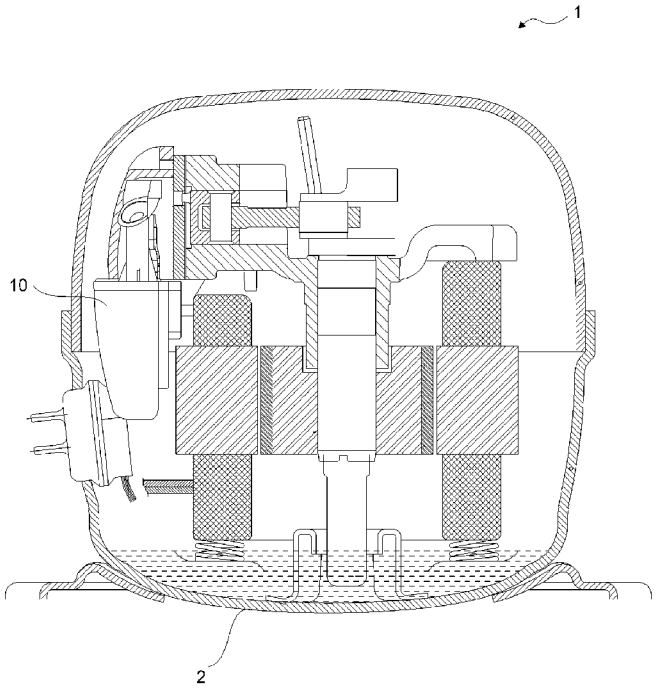
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[Continued on next page]

(54) Title: A COMPRESSOR COMPRISING A PROTECTION MEMBER

Figure 1



(57) Abstract: The present invention relates to a compressor (1) comprising a casing (2) carrying the components therein and wherein oil lubricating the movable members is placed, an inlet pipe (3) that is disposed on the casing (2) and that provides the refrigerant coming from the evaporator to be received into the casing (2), a suction muffler (10) that is disposed into the casing (2) and that provides the noise originating due to the refrigerant to be attenuated and a passage pipe (4) that is disposed on the suction muffler (10) and one end of which is positioned almost across from the end of the inlet pipe (3) opening into the casing (2), and wherein oil is prevented from entering into the inlet pipe (3) and/or the passage pipe (4) when the compressor (1) is brought to an inclined position.

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Description

A COMPRESSOR COMPRISING A PROTECTION MEMBER

[0001] The present invention relates to a compressor comprising a protection member.

[0002] In reciprocating hermetic compressors used in cooling devices, the sliding bearings wherein the crankshaft operates and the other movable members are lubricated with the oil disposed in the compressor casing. In compressors, lubrication provides friction losses of the movable members to be decreased, abrasion to be prevented and the temperature of the compressor members to be decreased. During the transportation of the cooling device, oil disposed at the bottom of the casing may enter into the cooling system pipes that open into the casing and is pumped into the cooling system at the first operation after the transportation. This situation decreases the cooling efficiency and damages the members of the cooling system. For this reason, cooling device, wherein compressors are used, are transported with great care and positioned so that the compressor remains parallel to the floor. This prevents the effective use of vehicles during transportation and increases storage costs. In some embodiments, among the pipes opening into the casing, the pipe on the suction muffler is extended towards into the inlet pipe of the casing; however, in these embodiments, oil cannot be fully prevented from entering into the system, and also amount of noise generated increases.

[0003] In the state of the art International Patent Application No. WO2009132934, a compressor is described, comprising a suction muffler. In this embodiment, the inlet of the suction muffler extends into the inlet pipe. Thus, the area through which the oil may enter the suction muffler is narrowed.

[0004] The aim of the present invention is the realization of a compressor wherein oil is prevented from entering into the cooling system pipes that open into the casing during the transportation.

[0005] The compressor realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof comprises an inlet pipe that is disposed on the casing and that provides the refrigerant

coming from the evaporator to be received into the casing, and a passage pipe that delivers the air coming from the inlet pipe to the compression system. The protection member is disposed on at least one of the inlet pipe and the passage pipe. When the compressor is brought to an inclined position, the protection member closes the mouth of the inlet pipe and/or the passage pipe, thus preventing the oil from entering therein.

[0006] In an embodiment of the present invention, the protection member comprises a shaft that extends longitudinally the diameter line, preferably parallel to the floor, of the cross-section of the inlet pipe and/or the passage pipe, a circular lid that is disposed on the part of the shaft remaining in the inlet pipe and/or the passage pipe, with a diameter almost equal to the pipe wherein it is located and a block that is disposed at the end of the shaft remaining outside the pipe and that moves the shaft so that the lid closes the inlet pipe and/or the passage pipe as the compressor moves.

[0007] In a version of this embodiment, the movement of the block is limited between two stoppers. One of the stoppers stops the block in a first position wherein the lid almost entirely closes the inlet pipe and/or the passage pipe, and the other stops the block in a second position wherein the lid is perpendicular to the cross-section of the inlet pipe and/or the passage pipe. While the block moves between the two stoppers, the lid moves between the first position and the second position.

[0008] In another embodiment of the present invention, the passage pipe is disposed on a suction muffler that provides the noise generated due to the movement of the the refrigerant to be attenuated. In this embodiment, the refrigerant leaving the inlet pipe passes to the passage pipe that is across from the part of the inlet pipe in the casing and the refrigerant is delivered to the cylinder after entering into the suction muffler.

[0009] By means of the present invention, it becomes possible to tilt or lay down the compressor and the cooling device wherein the compressor is used, thereby decreasing the transportation and storage costs. Ease of utilization is obtained, since no user intervention is needed for the protection member to prevent the oil from entering the inlet pipe and/or the

passage pipe. As the user starts tilting the cooling device and hence the compressor, the protection member is activated and starts closing the inlet pipe and/or the passage pipe.

[0010] A compressor realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

[0011] Figure 1 – is the schematic view of a compressor.

[0012] Figure 2 – is the partial view of a compressor.

[0013] Figure 3 – is the perspective view of the suction muffler when the protection member is mounted on the passage pipe.

[0014] Figure 4 – is the view of detail A in Figure 3.

[0015] Figure 5 – is the perspective view of the suction muffler when the protection member is mounted on the passage pipe.

[0016] Figure 6 – is the view of detail B in Figure 5.

[0017] The elements illustrated in the figures are numbered as follows:

1. Compressor
2. Casing
3. Inlet pipe
4. Passage pipe
5. Protection member
6. Shaft
7. Lid
8. Block
9. Stopper
10. Suction muffler

[0018] The compressor (1) comprises a casing (2) carrying the components therein and wherein the oil lubricating the movable members is placed, an inlet pipe (3) that is disposed on the casing (2) and that provides the refrigerant coming from the evaporator to be received into the casing (2), a suction muffler (10) that is disposed into the casing (2) and that provides the noise originating due to the refrigerant to be attenuated and a passage pipe (4) that is disposed on the suction muffler (10) and one end of which is positioned almost across from the end of the inlet pipe (3) opening into the casing (2) (Figure 1, Figure 2).

[0019] After entering into the casing (2) by means of the inlet pipe (3), the refrigerant coming from the evaporator enters into the passage pipe (4) that is almost at the same level with the inlet pipe (3), and is delivered to the suction muffler (10) from there.

[0020] The compressor (1) of the present invention comprises a protection member (5)

- that is disposed at the end part of the inlet pipe (3) and/or the passage pipe (4),
- that closes the mouth of the inlet pipe (3) and/or the passage pipe (4) when the casing (2) is brought to an inclined position, thus preventing the oil from entering into the inlet pipe (3) and/or the passage pipe (4) and
- that enables the refrigerant to pass through the inlet pipe (3) and/or the passage pipe (4) when the casing (2) is parallel to the floor.

[0021] When the casing (2) is brought to an inclined position during the transportation of the compressor (1), the protection member (5) closes the mouth of the inlet pipe (3) and/or the passage pipe (4) without requiring any intervention and prevents oil from entering therein. Thus, oil is prevented from being pumped into the cooling system, when the compressor (1) is brought to a position parallel to the floor and operated. Consequently, the cooling efficiency of the compressor (1) and the cooling device wherein the compressor (1) is used is increased, thereby prolonging the life span of the components. Since oil is prevented from entering into the cooling cycle when the compressor (1) is inclined, the compressor (1) can be transported by being tilted to one side and transportation costs for products, such as cooling devices wherein the compressor (1) is used, decreases (Figure 2, Figure 3, Figure 5).

[0022] In an embodiment of the present invention, the protection member (5) comprises a shaft (6) that intersects the inlet pipe (3) and/or the passage pipe (4) vertically, a circular lid (7) that is mounted to the part of the shaft (6) remaining inside the inlet pipe (3) and/or the passage pipe (4) so that its diameter line coincides with the shaft (6), and a block (8) that is mounted to the end of the shaft (6) remaining outside the inlet pipe (3)

and/or the passage pipe (4) and that moves the shaft (6) so that the lid (7) closes the mouth of the inlet pipe (3) and/or the passage pipe (4) when the casing (2) is brought to the inclined position. In this embodiment, the diameter of the lid (7) is almost equal to the diameter of the inlet pipe (3) and/or the passage pipe (4) whereon the lid (7) is disposed. The shaft (6) coincides with the diameter line of the cross-section of the inlet pipe (3) and/or the passage pipe (4). When the compressor (1) is brought to an inclined position, the block (8) rotates the shaft (6) and the lid (7) connected to the shaft (6) with the effect of the gravity, and closes the mouth of the inlet pipe (3) and/or the passage pipe (4), thereby preventing oil from entering therein. Thus, the compressor (1) can be tilted in the direction the block (8) moves. By means of the entirely mechanical structure of the protection member (5), component costs are decreased. Moreover, since no user intervention is needed for the protection member (5) to be activated, ease of utilization is provided (Figure 4, Figure 6).

[0023] In a version of this embodiment, the protection member (5) comprises at least two stoppers (9) that limit the movement of the block (8) and provide the lid (7) to remain between a first position (P1) wherein the lid (7) is positioned so as to almost entirely closes the mouth of the inlet pipe (3) and/or the passage pipe (4) and a second position (P2) wherein the lid (7) is positioned so as to be perpendicular to the cross-section of the inlet pipe (3) and/or the passage pipe (4). Thus, no matter how large the angle the compressor (1) makes with the ground while being transported is, the lid (7) is prevented from moving further from the first position (P1) and opening the mouth of the inlet pipe (3) and/or the passage pipe (4), thereby oil is prevented from entering therein. Before the oil level reaches the level of the inlet pipe (3) and/or the passage pipe (4), the lid (7) changes to the first position (P1), and thus oil is prevented from entering into the inlet pipe (3) and/or the passage pipe (4) (Figure 4, Figure 6).

[0024] By means of the present invention, when the compressor (1) is brought to an inclined position during operations such as transportation, relocation, the protection member (5) prevents oil from entering into the inlet pipe (3) and/or the passage pipe (4). Thus, the necessity of transporting the

cooling devices wherein the compressor (1) is used in an upright position, is eliminated, thus decrease in transportation costs is provided.

[0025] It is to be understood that the present invention is not limited to the embodiments disclosed above and a person skilled in the art can easily introduce different embodiments. These should be considered within the scope of the protection postulated by the claims of the present invention.

Claims

1. A compressor (1) **comprising** a casing (2) carrying the components therein and wherein oil lubricating the movable members is placed, an inlet pipe (3) that is disposed on the casing (2) and that provides the refrigerant coming from the evaporator to be received into the casing (2), a suction muffler (10) that is disposed into the casing (2) and that provides the noise originating due to the refrigerant to be attenuated and a passage pipe (4) that is disposed on the suction muffler (10) and one end of which is positioned almost across from the end of the inlet pipe (3) opening into the casing (2),
   characterized by a protection member (5)
   - that is disposed at the end part of the inlet pipe (3) and/or the passage pipe (4),
   - that closes the mouth of the inlet pipe (3) and/or the passage pipe (4) when the casing (2) is brought to an inclined position, thus preventing the oil from entering into the inlet pipe (3) and/or the passage pipe (4) and
   - that enables the refrigerant to pass through the inlet pipe (3) and/or the passage pipe (4) when the casing (2) is parallel to the floor.
2. A compressor (1) as in Claim 1, **characterized by** the protection member (5) that comprises a shaft (6) that intersects the inlet pipe (3) and/or the passage pipe (4) vertically, a circular lid (7) that is mounted to the part of the shaft (6) remaining inside the inlet pipe (3) and/or the passage pipe (4) so that its diameter line coincides with the shaft (6), and a block (8) that is mounted to the end of the shaft (6) remaining outside the inlet pipe (3) and/or the passage pipe (4) and thatmoves the shaft (6) so that the lid (7) closes the mouth of the inlet pipe (3) and/or the passage pipe (4) when the casing (2) is brought to the inclined position.
3. A compressor (1) as in Claim 2, **characterized by** the protection member (5) that comprises at least two stoppers (9) that limit the movement of the block (8) and provide the lid (7) to remain between a first position (P1) wherein the lid (7) is positioned so as to almost entirely close the mouth of the inlet pipe (3) and/or the passage pipe (4) and a second position (P2) wherein the lid (7) is positioned so as to be perpendicular to the cross-section of the inlet pipe (3) and/or the passage pipe (4).

Figure 1

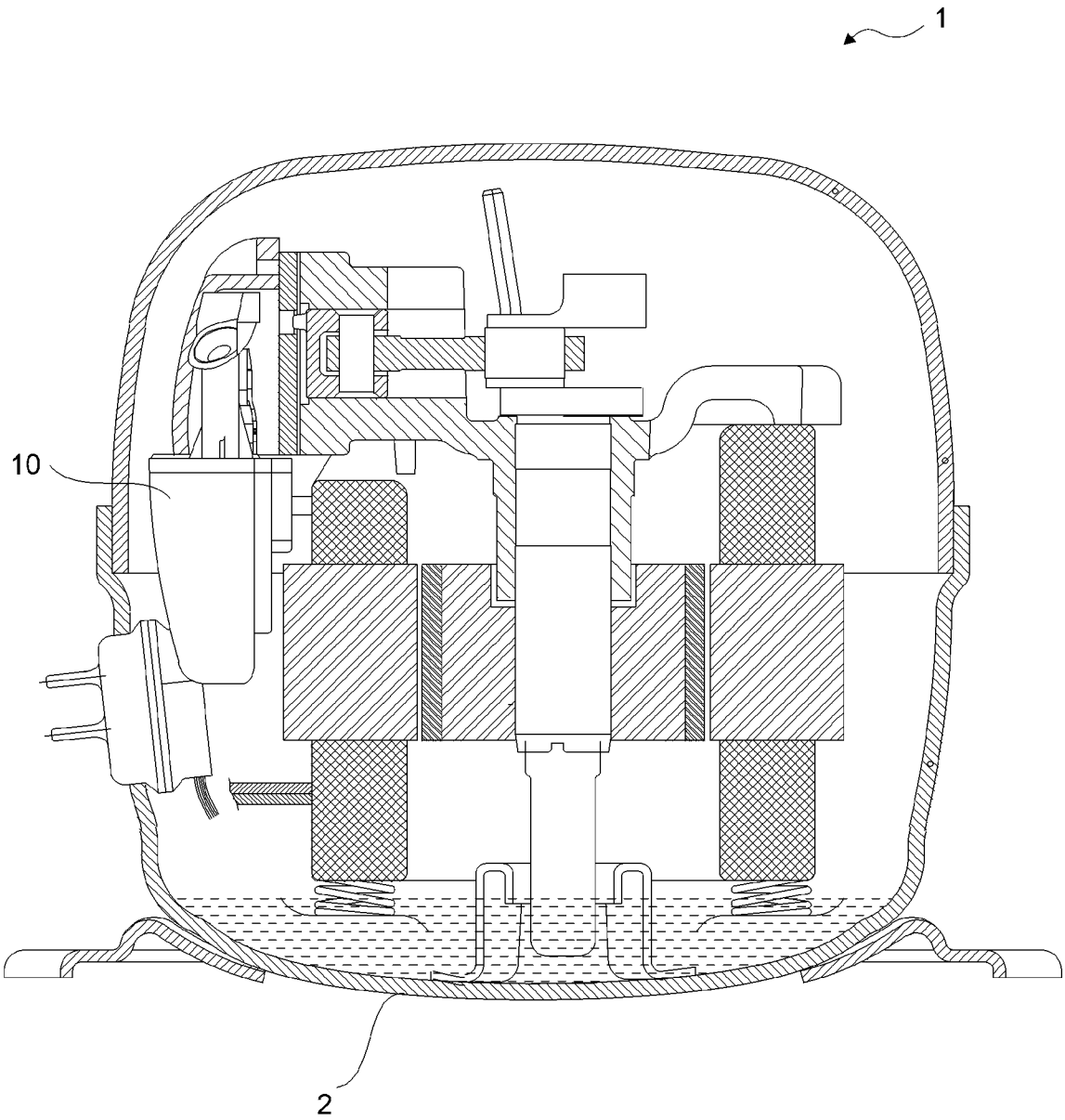


Figure 2

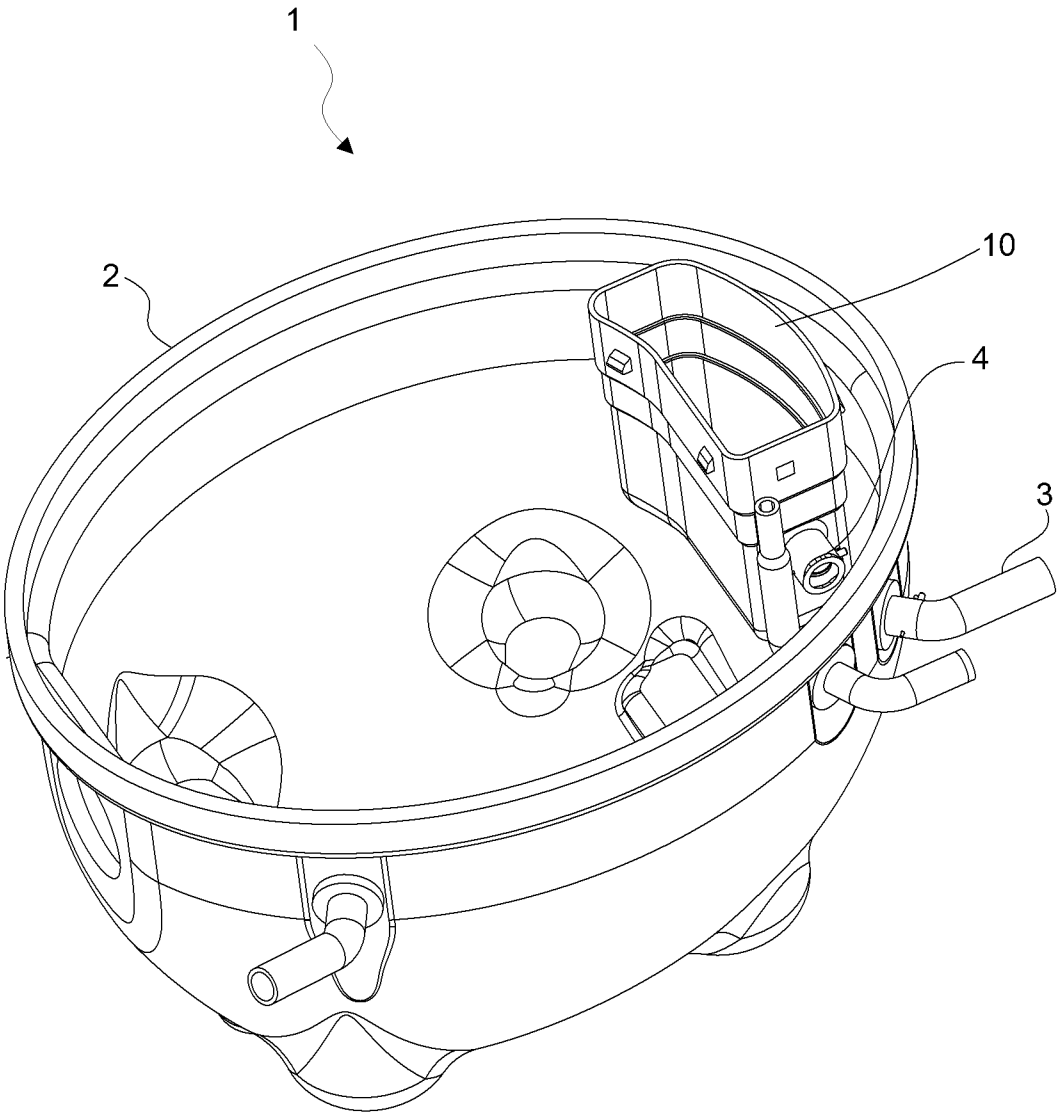


Figure 3

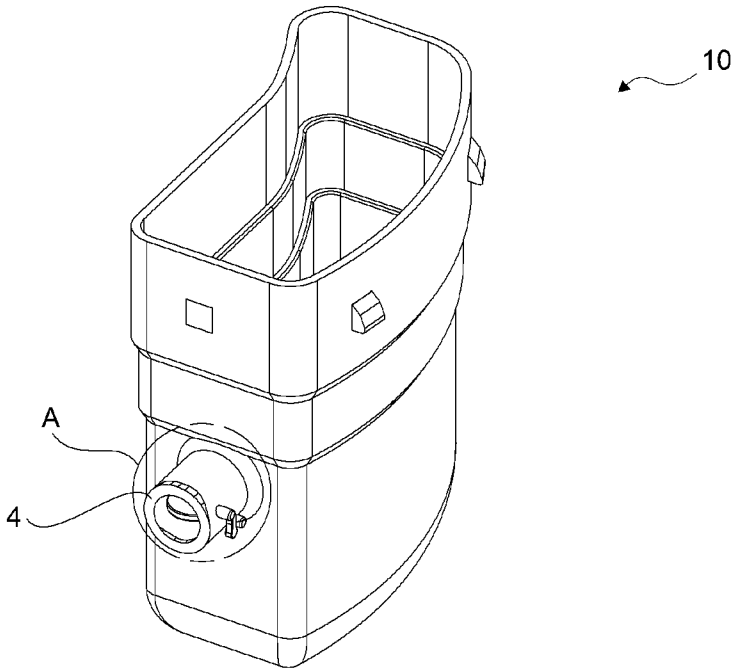


Figure 4

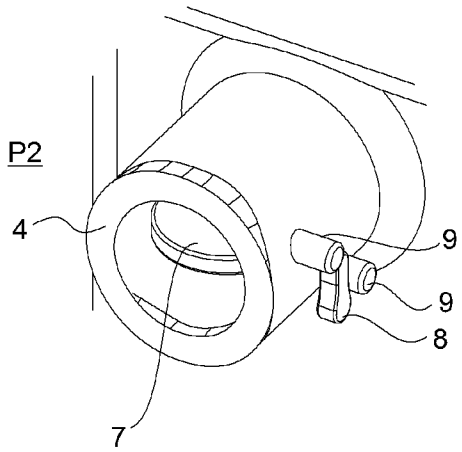


Figure 5

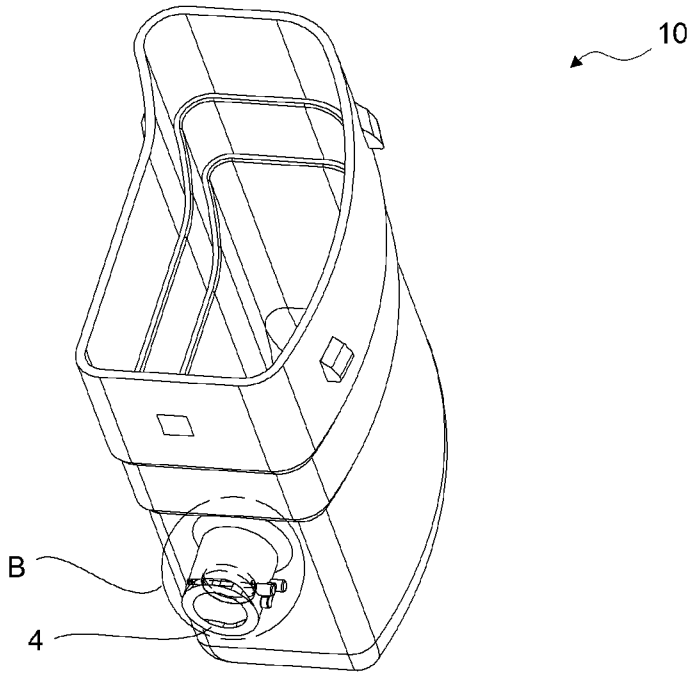
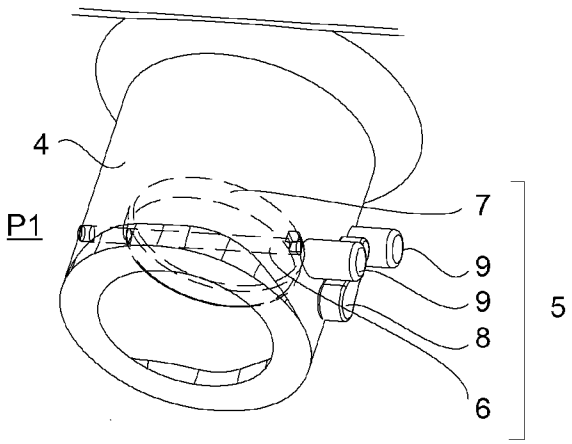


Figure 6



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/069512

A. CLASSIFICATION OF SUBJECT MATTER
INV. F04B39/00 F04B39/02 F04B39/12 F25B31/00
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)
F04B F25B

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.
A	US 5 988 990 A (LEE SUNG-TAE [KR]) 23 November 1999 (1999-11-23) column 2, line 17 - column 4, line 67; figures 1,5,6	1-3
A	WO 2009/132934 A1 (ARCELIK AS [TR]; MARASLI SARPER [TR]; ABDIK BORA [TR]; UNLU UMIT [TR];) 5 November 2009 (2009-11-05) cited in the application paragraphs [0018] - [0029]; figure 1	1-3
A	EP 1 785 624 A1 (LG ELECTRONICS INC [KR]) 16 May 2007 (2007-05-16) paragraphs [0034] - [0077]; figures 2,3	1-3
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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
4 March 2013	13/03/2013

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INTERNATIONAL SEARCH REPORT

International application No
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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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Information on patent family members

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