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- **Eldem, Mehmet**
Organize Sanayi Bolgesi
45030, Manisa (TR)
- **Haspolat, Erdal**
Organize Sanayi Bolgesi
45030, Manisa (TR)

(71) Applicant: **Vestel Beyaz Esya Sanayi Ve Ticaret
A.S.**
45030 Manisa (TR)

(74) Representative: **Cayli, Hülya**
Paragon Consultancy Inc.
Koza Sokak No: 60/6
GOP
06700 Ankara (TR)

(72) Inventors:
• **Ugur, Hasan**
Organize Sanayi Bolgesi
45030, Manisa (TR)

(54) **Overflow detection apparatus**

(57) An overflow detection apparatus (A) is used to detect the overflow of water in washing machines. The apparatus (A) comprises a pool (2) in which the overflow water accumulates, a float (1) which can move up and down together with the water inside the pool (2), a cap (3) which covers the top of the pool (2), inlet ports that

allow water to be filled into the pool (2) and a switch (4) which is triggered by the contact with the float (1). In order to allow water that comes from the water inlet pipe (31) on the cap (3) to directly run beneath the float (1), the inlet pipe (31) is positioned on the top of the cap and above the holes (12) on the float (1).

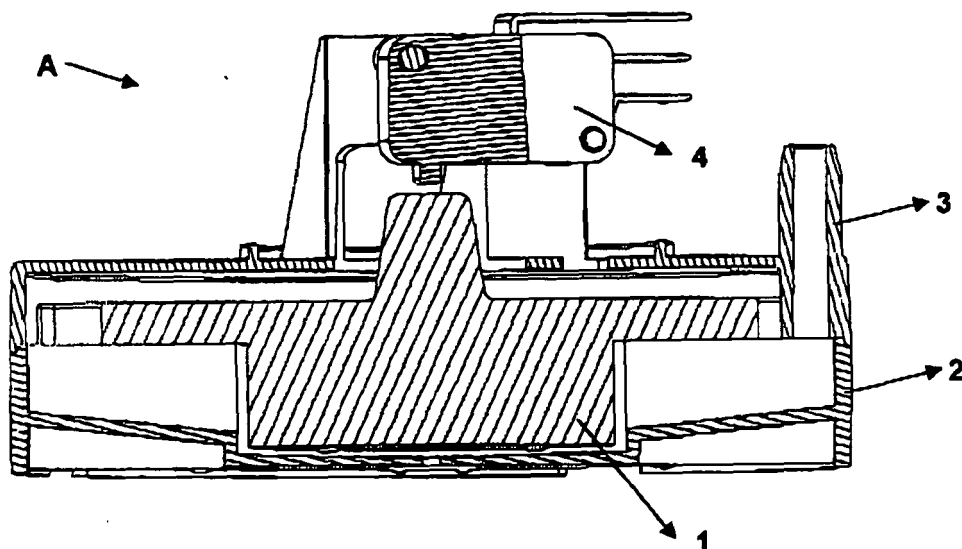


Figure - 1

Description

Technical Field

[0001] The invention is related to the overflow detectors which are used for the detection of the water that overflows in washing machines or leaks out from the hydraulic connections thereof.

Prior Art

[0002] The problems such as overage of the water taken occasionally in washing machines, slanting ground on which the machine resides, leakage from the hydraulic connections cause the utility water to leak out from these machines. In order to prevent the water overflow, these machines are provided with the overflow detecting systems. In the prior art, the device which prevents the overflow in the published patent application TR200200809 can be given as an example for these systems. The device disclosed in this document comprises an internal mobile float within the external float which is built into a float slot. The overflowing water runs over the internal float and fills the external float. The filling water lifts the internal float to which it applies pressure from the bottom side thereof and the internal float thus operates a switch on its top side with its that movement. In this device, the water that overflows from the machine firstly runs onto the internal float from the grooves on the float slot and then into the external float from the cavities on the edge of the internal float. This movement of the water extends the time of the water that enters the device first to move the internal float and the operation of the switch is also delayed. Furthermore, the rapid accession of the water occasionally onto the internal float causes water to jump and reach the switch. The inventive apparatus of which details are disclosed below has been developed to ensure more rapid detection of the overflowing water. The accession of the water to the switch used is also prevented.

Brief Disclosure of the Invention

[0003] Overflow detection apparatus according to the invention comprises a pool in which the overflowing water accumulates, a float which can move up and down with the movement of the water inside the pool, a cap which covers the top of the pool and has the inlet ports that allow water to be filled into the pool and a switch which is triggered by the contact of the float with its up movement. There is provided at least one water inlet pipe on the cap. The inlet pipe is used to direct the water that overflows from the machine into the pool. The inlet pipe extends somewhat beginning from the top side of the cap towards the bottom side of the float. On the edges of the float, there is provided at least one hole. Each hole has been formed to allow the water that comes from the water inlet pipes on the cap to directly run towards the beneath

of the float. In the assembled apparatus, the inlet pipes on the cap have been positioned so as to engage into these holes. In this way, the water that overflows from the machine is directly directed towards the beneath of the float, i.e. towards the grooves in the pool, and the float is ensured to move up rapidly as the pool is filled. Furthermore, the more rapid elevation of the water is provided by ensuring the reservoir in which the water is collected inside the pool to be smaller than the total area of the pool. In addition, directing the overflowing water from the inlet pipe directly towards the beneath of the float prevents water to reach the switch by jumping.

Aims of the Invention

[0004] It is an aim of the invention to form an overflow detection apparatus in washing machines with which the overflowing water is detected rapidly through directing the overflowing water from the inlet pipe in the apparatus directly towards the beneath of the float.

[0005] Another aim of the invention is to prevent water to reach the switch by jumping through directing the overflowing water from the inlet pipe in the apparatus directly towards the beneath of the float.

[0006] Yet another aim of the invention is to ensure the more rapid elevation of the water by keeping the reservoir in which the water is collected inside the pool smaller than the total area of the pool and thus allow a more rapid detection.

Description of the Drawings

[0007] The exemplary embodiments regarding the inventive overflow detection apparatus are shown in the attached drawings, wherein:

Fig. 1 is a side sectional view of the overflow detection apparatus.

Fig. 2 is a side perspective view of the overflow detection apparatus.

Fig. 3 is a bottom perspective view of the float.

Fig. 4 is a top perspective view of the float.

Fig. 5 is a top perspective view of the pool.

Fig. 6 is a top perspective view of both the pool and the float together.

Fig. 7 is a top perspective view of the cap.

Fig. 8 is a bottom perspective view of the cap.

Fig. 9 is a side sectional view of the overflow detection apparatus.

[0008] The parts in the figures are numbered one by one and the corresponding terms of these numbers are given below.

55 Overflow detection apparatus (A)

[0009]

Float (1)
 Pool (2)
 Cap (3)
 Switch (4)
 Protrusion (11)
 Hole (12)
 Channel (13)
 Channel (14)
 Projection (15)
 Groove (21)
 Reservoir (22)
 Hole (23)
 Connection arms (24, 24')
 Snap fit (25)
 Guide (26)
 Projection (27)
 Inlet pipe (31)
 Snap fit (35)
 Guide (36)
 Opening (38)
 Connection means (39)

Disclosure of the Invention

[0010] Fig. 1 provides a side sectional view of the overflow detection apparatus (A) which is used to detect the water that is taken excessively in washing machines or leaks out from the hydraulic connections. The apparatus (A) of which side perspective view is provided in fig. 2 comprises a pool (2) in which the overflowing water accumulates, a float (1) which can move up and down with the movement of the water inside the pool (2), a cap (3) which covers the top of the pool (2) and has the inlet ports that allow water to be filled into the pool (2) and a switch (4) which is triggered by the contact of the float (1) with its up movement.

[0011] Figs. 3-4 provide the bottom and the top perspective views of the float (1). On the top surface of the float (1), there is provided a protrusion (11) which is formed to contact the switch as a result of the water lifting. On the top of the float (1) (shown on the edge in the figures), there is provided at least one hole (12). Each hole (12) has been formed to allow the water that comes from the water inlet pipes (31) (figure - 9) on the cap (3) to directly run towards the beneath of the float (1). In the assembled apparatus (A), the inlet pipes (31) on the cap (3) have been positioned so as to engage into these holes (12). On the bottom side of the float (1), there is provided a channel (13) beginning from each hole (12) and extending inwards (towards the middle of the float). These channels (13) are opened to a joint channel (14) which is formed so as to leave a plain area therein. The intended use of these said channels (13, 14) is to guide around the side walls which are formed by the water passage grooves (21) inside the pool (2). On the bottom side of the float (1), there are provided projections (15) which are formed to minimize the contact of the float (1) with the surfaces on which it resides. In this way, it is prevented

the bottom surface of the float (1) to stick to the pool (2) because of the overflowing water.

[0012] Fig. 5 provides a top perspective view of the pool. There is provided at least one water passage groove (21) that extends inwards from the edge of the pool (2). Each groove (21) has been arranged so as to confront with the hole (12) and the channel (13) on the float (1). The inner surface of the groove (21) is slanted so as to allow water to run from the edge towards the inside. Each groove (21) is opened to the collection reservoir (22) in the middle of the pool (2). The collection reservoir (22) is the part where the water accumulates. The water that accumulates here allows the up movement of the float (1). In order to discharge the water that accumulates in the reservoir (22), there is provided a hole (23) which is normally closed. When this hole (23) is opened, the water inside the pool (2) is discharged out. On the pool (2), there are provided connection arms (24, 24') which are used to fix the apparatus (A) onto a surface (These connection arms (24, 24') can also be positioned on the cap (3)). Between the connection arms (24, 24'), there is provided at least one projection (27) extending outwards from the side of the pool (2) (or the cap (3)). In case the apparatus (A) is fitted onto a surface with the help of the connection arms (24, 24'), these projections (27) also rest on said surface and this reduces the oscillation amount of the apparatus (A) due to various reasons (operation of the machine, the overflow of the water, the movement of the float, etc.). Again on the edge side of the pool (2), at least one snap fit (25) is used in order to ensure the combination with the cap (3). Also, in order to keep the layout position of the cap (3) always same relative to the pool (2), there is provided at least one male or female positioning guide (26) on the pool (2). Likewise, on the cap (3), there is provided at least one more guide (36) of similar form so as to confront with this guide (shown in figure - 8).

[0013] Fig. 6 provides a top perspective view of both the pool (2) and the float (1) together. As also shown in this exemplary figure, the holes (12) on the float (1) have been arranged so as to confront with the grooves (21) on the pool (2).

[0014] Figs. 7 and 8 provide the top and the bottom perspective views of the cap (3). On the edges of the cap (3), there is provided at least one snap fit (35) which is formed so as to combine with each snap fit (25) in the pool (2). On the top side of the cap (3), there is provided a connection means (39) to which said switch (4) can be fitted. The switch (4) which is fixed on this means (39) is triggered with the contact of the protrusion (11) on the float (1) which moves up with the elevation of the water in the pool (2). Therefore, on the top side of the cap (3), there is provided an opening (38) of adequate size through which said protrusion (11) can be passed. There is provided at least one water inlet pipe (31) on the cap (3). This pipe (31) is used to direct the water that overflows from the machine into the pool (2). As also shown in fig. 9, each inlet pipe (31) has been positioned so as

to confront with a hole (12) on the float (1) in the assembled apparatus (A). Furthermore, the inlet pipe (31) extends somewhat beginning from the top side of the cap towards the bottom side of the float (1). In this way, the water that overflows from the machine is directly directed towards the beneath of the float (1), i.e. towards the grooves (21) in the pool (2), and the float (1) is ensured to move up rapidly as the pool (2) is filled (the direction of movement of the overflow water is shown with the arrows in figure - 9). In addition, directing the overflowing water from the inlet pipe (31) directly towards the beneath of the float (1) prevents water to reach the switch by jumping. As a result of triggering the switch (4) by the float (1), the information that the water overflowing from the washing machine has reached the upper limit is also detected by a circuit connected to the switch (4) and it is prevented machine to take more water and thus leak water out.

Claims

1. An overflow detection apparatus (A), which is used to detect the overflowing water in washing machines, comprising a pool (2) in which the overflowing water accumulates, a float (1) which can move up and down with the movement of the water inside the pool (2), a cap (3) which covers the top of the pool (2) and has the inlet ports that allow water to be filled into the pool (2) and a switch (4) which is triggered by the contact of the float (1) with its up movement, **characterized in that** in order to allow water that comes from at least one water inlet pipe (31) on the cap (3) to directly run towards the beneath of the float (1), each inlet pipe (31) is positioned such that it begins from the top side of the cap and engages into at least one hole (12) on the float (1).
2. An apparatus (A) according to the claim 1, **characterized in that** the float (1) comprises a protrusion (11) on its top surface in order to trigger the switch (4) by contacting it as a result of the water lifting.
3. An apparatus (A) according to the claim 1, **characterized in that** in order to prevent the bottom surface of the float (1) to stick to the pool (2) because of the overflowing water, on the bottom side of the float (1), there are provided projections (15) which minimize the contact of the float with the surfaces on which it resides.
4. An apparatus (A) according to the claim 1, **characterized in that** on the bottom side of the float (1), there is provided a channel (13) beginning from each hole (12) and extending towards the middle of the float.
5. An apparatus (A) according to the claim 4, **characterized in that** said channels (13) are opened to a joint channel (14) which is formed so as to leave a plain area therein.
6. An apparatus (A) according to the claim 1, **characterized in that** there is provided at least one water passage groove (21) which extends inwards from the edge of the pool (2) and is opened into the water collection reservoir (22) in the middle of the pool (2).
7. An apparatus (A) according to the claim 6, **characterized in that** each groove (21) is located so as to confront with the hole (12) and the channel (13) on the float (1).
8. An apparatus (A) according to the claim 6, **characterized in that** the inner surface of the groove (21) is slanted so as to allow water to run from the edge towards the inside.
9. An apparatus (A) according to the claim 6, **characterized in that** in the collection reservoir (22), there is provided a discharge hole (23) which is normally closed.
10. An apparatus (A) according to the claim 1, **characterized in that** on the pool (2), there are provided connection arms (24, 24') which are used to fix the apparatus (A) onto a surface.
11. An apparatus (A) according to the claim 1, **characterized in that** on the cap (3), there are provided connection arms (24, 24') which are used to fix the apparatus (A) onto a surface.
12. An apparatus (A) according to the claim 1, **characterized in that** for the combination of the pool (2) and the cap (3), there are provided at least one snap fit (25) on the edge side of the pool (2) and at least one snap fit (35) which is formed so as to engage with each snap fit (25) in the pool (2) on the edges of the cap (3).
13. An apparatus (A) according to the claim 1, **characterized in that** in order to keep the layout position of the cap (3) and the pool (2) always same relative to each other, there are provided at least one male or female positioning guide (26) on the pool (2) and at least one guide (36) of similar form so as to confront with this guide on the cap (3).
14. An apparatus (A) according to the claim 1, **characterized in that** on the top side of the cap (3), there is provided a connection means (39) to which said switch (4) can be fitted.
15. An apparatus (A) according to the claim 2, **characterized in that** on the top side of the cap (3), there

is provided an opening (38) of adequate size through which said protrusion (11) can be passed.

16. An apparatus (A) according to the claim 10, **characterized in that** between the connection arms (24, 24'), there is provided at least one projection (27) extending outwards from the side of the pool (2). 5
17. An apparatus (A) according to the claim 11, **characterized in that** between the connection arms (24, 24'), there is provided at least one projection (27) extending outwards from the side of the cap (3). 10

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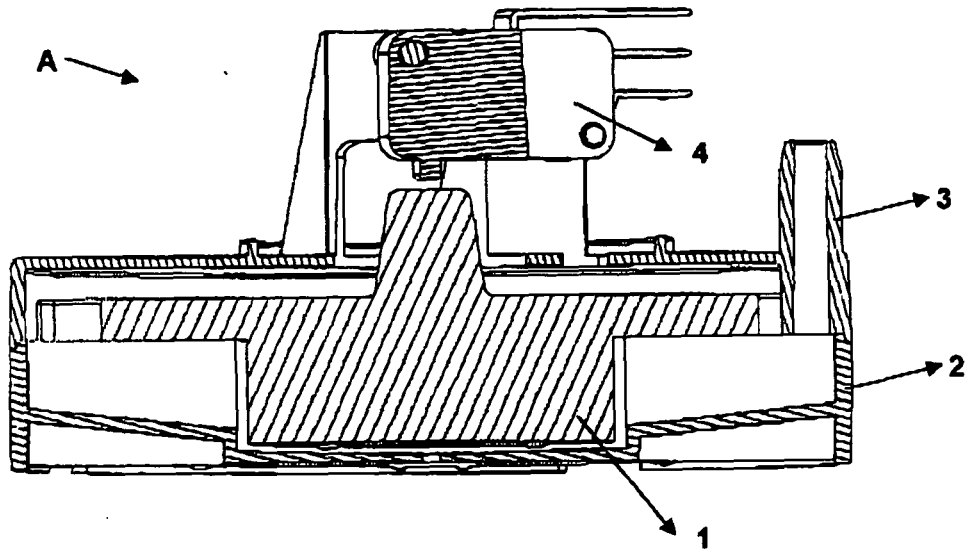


Figure - 1

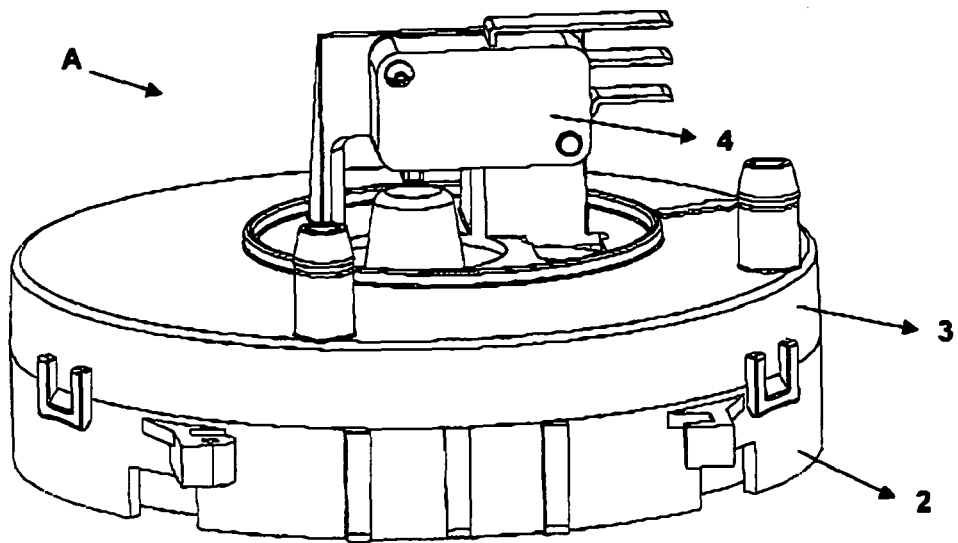


Figure - 2

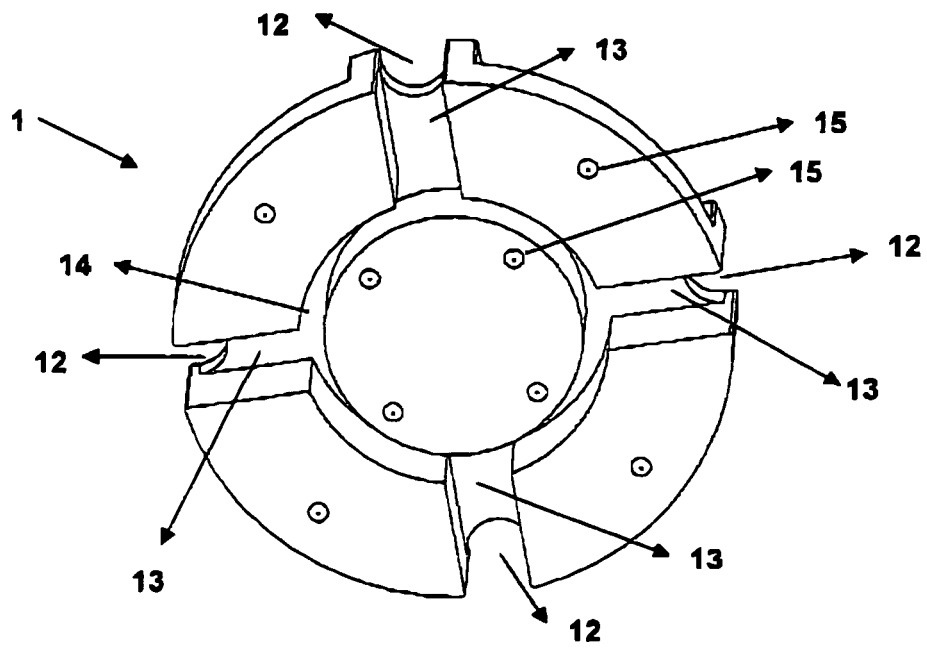


Figure - 3

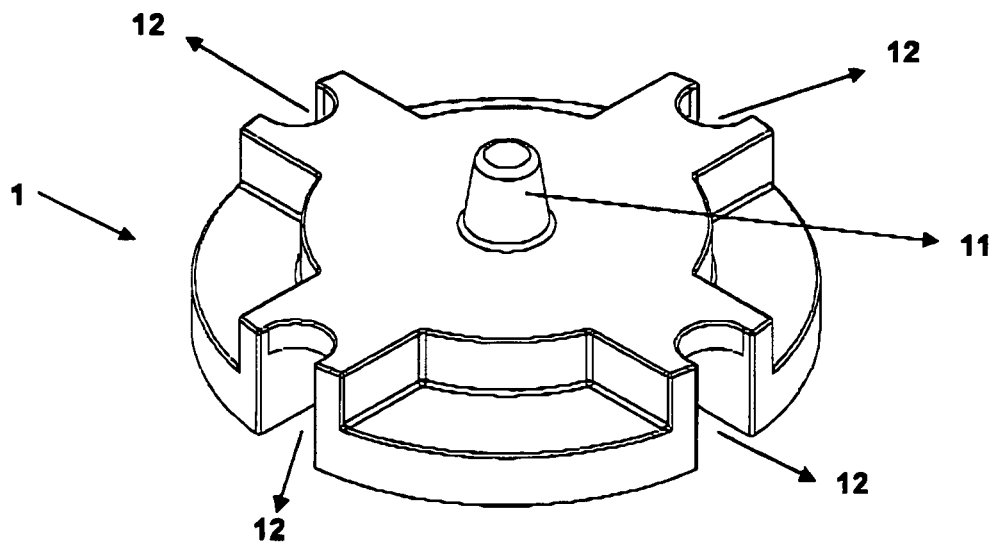
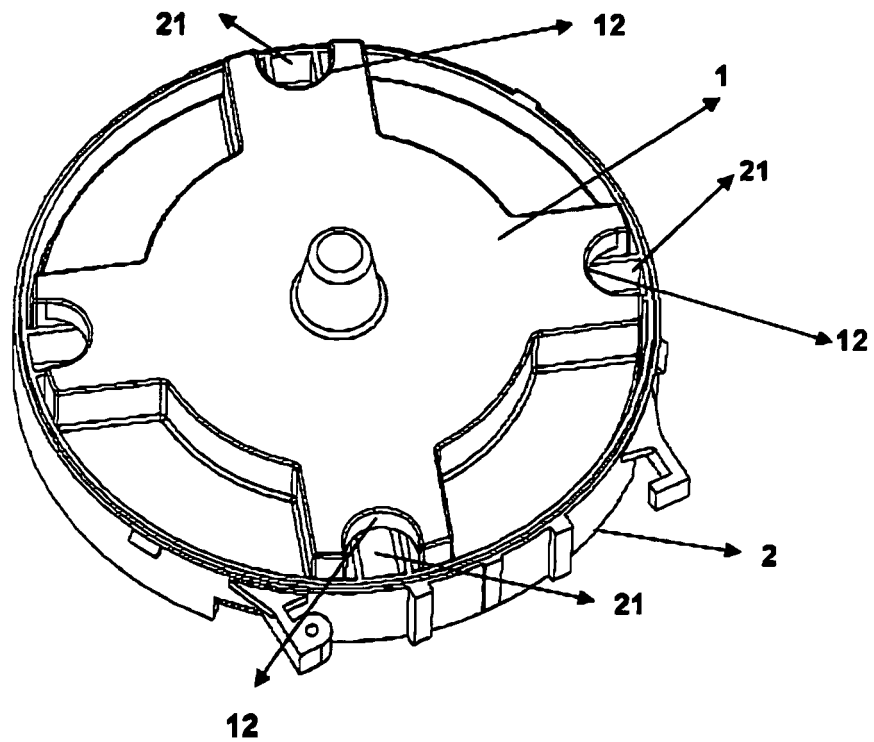
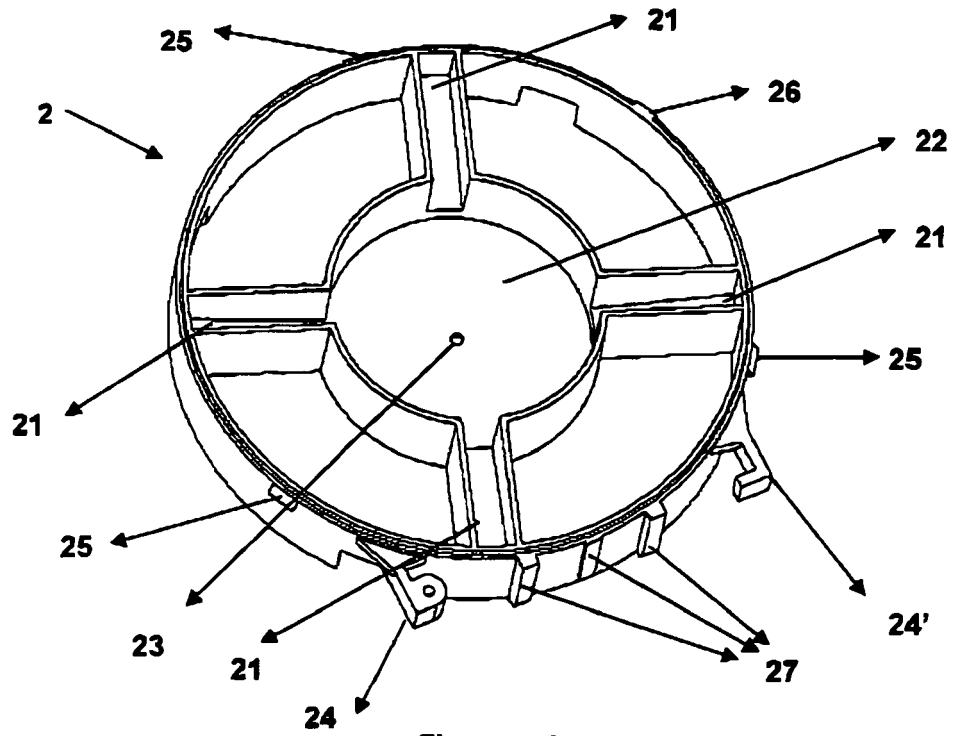


Figure - 4



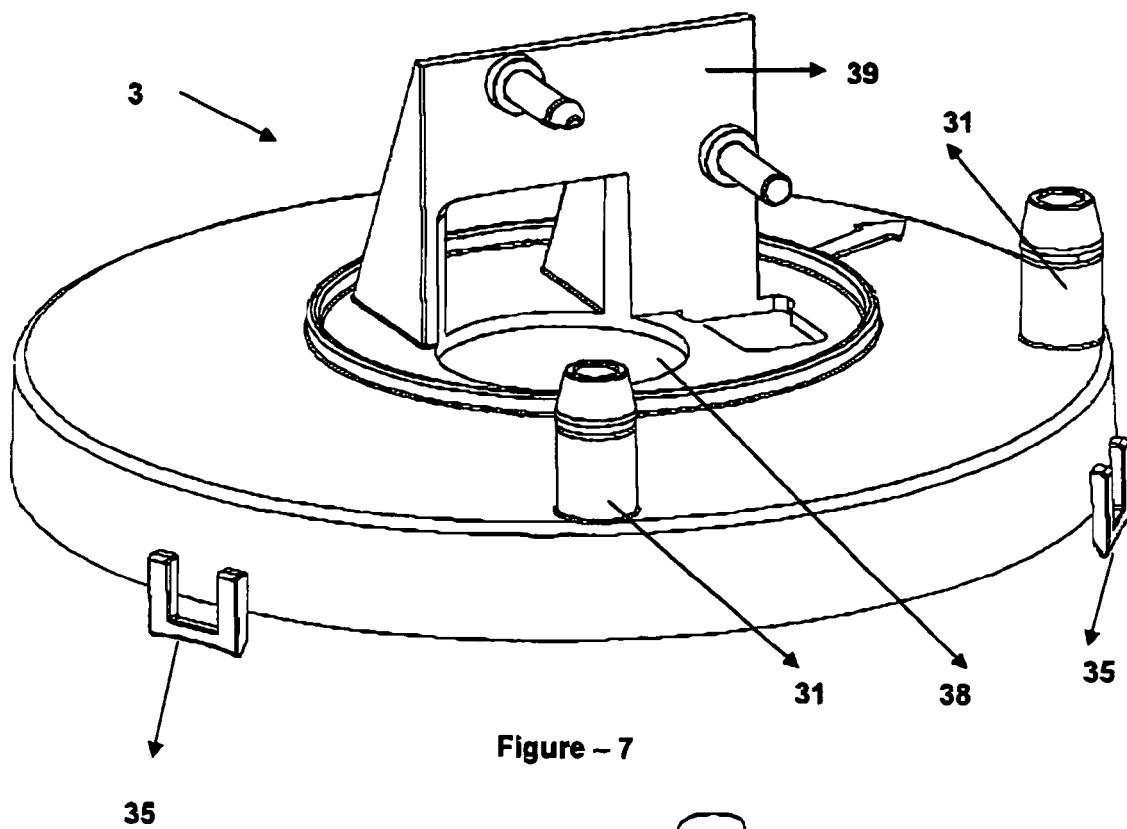


Figure - 7

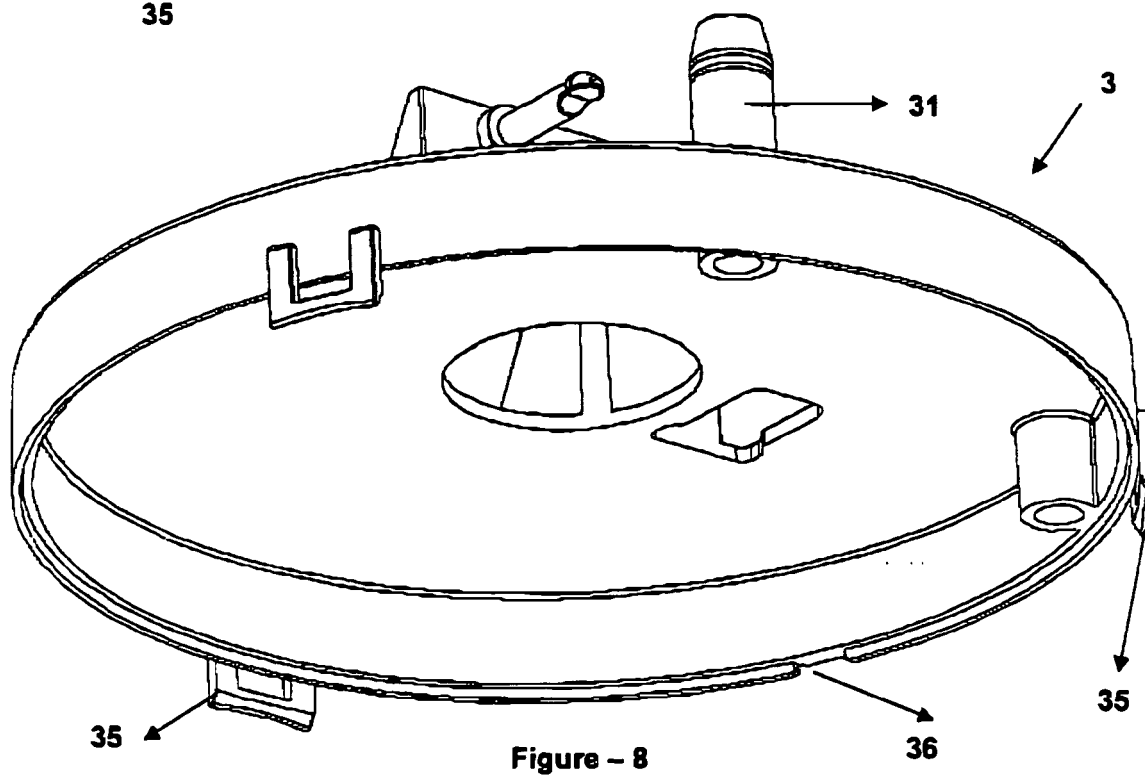


Figure - 8

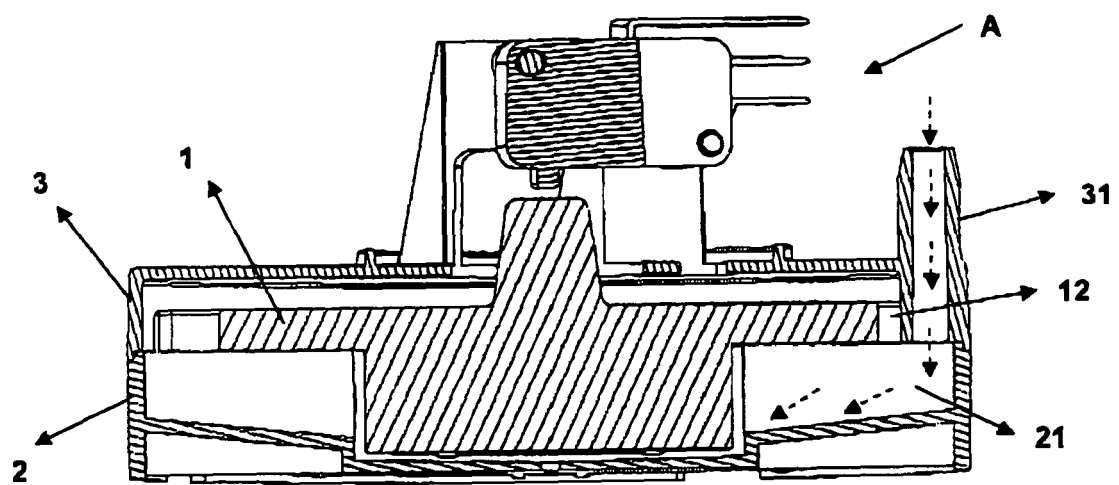


Figure - 9



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Application Number
EP 07 10 4156

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