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(54) **A WASHING MACHINE**

WASCHMASCHINE

MACHINE À LAVER

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Description

[0001] The present invention relates to a washing machine wherein washing performance is improved.

[0002] In washing machines, a considerable amount of detergent, which is not dissolved in washing water, enters the hose or the pump during water intake and discharged at the end of the washing process without acting in the wash. In such case, the washing process is performed ineffectively and the detergent is used inefficiently. There are various embodiments which maintain the detergent to remain inside the tub during washing and have an efficient part in the washing process.

[0003] Solutions have been introduced in the state of the art, wherein a ball is inserted inside the hose.

[0004] In washing machines wherein these solutions are implemented, a pump discharges water at the end of a washing process. Once the pump stops, water remaining in the discharge line returns to the hose and pushes the ball in the direction of the discharging hole, said ball having a density lower than that of water. The ball keeps on moving inside the hose until coming into contact with a stopper arranged before the discharging hole. There is a hole over the stopper, which maintains the passage of water and air between the tub and the hose. Leakproofing is obtained between the tub and the hose when the ball comes into contact with the stopper and closes the hole there between. Thus, during the following wash cycle, when detergent-containing water is taken into the machine, said water does not enter the discharging hose, remains inside the tub, and takes effective part in the washing process.

[0005] In the foregoing embodiments, the ball which has lower density than water floats on the surface thereof. The hole positioned over the stopper has a width smaller than the diameter of the ball. When the ball comes into contact with the stopper and closes the hole there between, air is compressed between the stopper and the water inside the hose (Figure 2). However, in the case when the amount of compressed air in the hose is considerable, the ball presses weaker against the stopper. The ball moves easier particularly when wash movements produce vibrations while the program is on. Water which is inside the hose mixes with wash water through the change of position of the ball.

[0006] In the state of the art, the German Patent Application No DE3602217 describes a system which comprises a ball, a hose wherein said ball can move, and a stopper.

[0007] The aim of the present invention is the realization of a washing machine wherein the detergent takes effective part in the washing process.

[0008] A washing machine realized in order to attain the aim of the present invention is described in the attached claims. Said washing machine, comprises at least one flexible set positioned between the stopper and the ball and which extends from the interior surface of the hose in the direction of the centre thereof, and at least one opening which enables air and water to pass from the in-between of the wall and the pump to the in-between of the wall and the stopper when the ball touches said wall. The set extends from all around the interior surface of the hose towards the centre thereof. The set, constituting an obstacle, slows the ball in the movement towards the stopper. Said set also enables air and water to pass into the tub through openings produced by the slowdown of the ball touching the wall. In this way, the ball is delayed in blocking the stopper, which provides more air to be discharged from inside the hose.

[0009] In one embodiment of the invention, the set is constructed in a way so as to encircle entirely the interior surface of the hose. The openings are in the form of holes over said set. The hose comprises a passage at the centre of the set, of which the width is less than the diameter of the ball and which enables said ball to get partially through. The passage accelerates the flow of water in the direction of water absorption when the pump runs and the discharging of air from inside the hose when the ball uprises. Once the ball comes into contact with the set and closes the passage in between, air is discharged only through the openings.

[0010] In another embodiment of the invention, the set provided on the interior surface of the hose has a circular shape. Besides, the openings are in the form of slots that extend from the centre of the hose towards the interior wall thereof. Said openings not only divide the circular-shaped set at least into two but also enable air and water to pass through. The ball is slowed down in movement by a set which has a fragmented constitution. This embodiment, which requires a basic mould design, is simpler to produce in comparison to the embodiment wherein the openings are positioned over the wall.

[0011] In one other embodiment of the invention, the opening is in the form of a channel that enables air and water to pass from the in-between of the set and the pump to the in-between of the set and the stopper. This channel-shaped opening opens by one end to the space between the set and the stopper and by the other end to the space between the pump and the set. Said openings function like a bypass line.

[0012] The present invention maintains the ball inside the hose submerged further down in water and enables a better leakproofing between the ball and the stopper.

[0013] A washing machine realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is a schematic view of a washing machine.

Figure 2 - is a schematic view of a hose in the prior art washing machines.

Figure 3 - is a schematic view of a hose in an embodiment of the invention.

Figure 4 - is a schematic view of a hose wherein the ball is touching the set.

Figure 5 - is a schematic view of a hose wherein the ball is touching the stopper.

Figure 6 - is a schematic view from above of the set in an embodiment of the invention.
Figure 7 - is a schematic view from above of the set in another embodiment of the invention.
Figure 8 - is a schematic view of the hose in the alternative embodiment of the invention.

[0014] The elements illustrated in the figures are numbered as follows:

1. Washing machine
2. Tub
3. Drum
4. Discharging hole
5. Pump
6. Hose
7. Ball
8. Stopper
9. Set
10. Opening

[0015] The washing machine (1) comprises a tub (2) wherein the washing process is performed,

- a drum (3) placed inside the tub (2), wherein laundry is loaded,
- an discharging hole (4) positioned at the bottom of the tub (2), through which water is discharged,
- a pump (5) which serves to mix tub (2) water into a wash cycle or to discharge water,
- a hose (6), connected by one end to the discharging hole (4) and by the other end to the pump (5), which conveys tub (2) water to the pump (5),
- a ball (7) positioned inside the hose (6) and which, under the impact of water pressure, opens and closes the discharging hole (4),
  a stopper (8) arranged at the extremity whereby the hose (6) is connected to the discharging hole (4), extending from the interior surface of the hose (6) towards the centre thereof, and which keeps the ball (7) from getting out through the discharging hole (4) when said ball leans there against (Figure 1 and Figure 3),

[0016] Said washing machine (1) also comprises at least one flexible set (9) inside the hose (6) positioned between the stopper (8) and the ball (7), which extends from the interior surface of the hose (6) in the direction of the centre thereof, and at least one opening (10) that enables air and water to pass from the in-between of the set (9) and the pump (5) to the in-between of the set (9) and the stopper (8) once the ball (7) touches said set (9) (Figure 3).

[0017] The set (9) divides the interior space of the hose (6) into two sections; the space between said set (9) and the stopper (8) is the air chamber (H), and the space between said set (9) and the pump (5), wherein the ball (7) is also located, is the discharging chamber (T). The ball (7) in the discharging chamber (T), while moving towards the discharging hole (4) under the impact of water pressure, comes into contact with the set (9) before touching the stopper (8). The set (9) blocks the movement of the ball (7), and the ball (7) puts forth pressure on the set (9). Pressure exerted onto the set (9) slows the ball (7), which is therefore delayed in closing the discharging hole (4).

[0018] At the same time, air and water in the discharging chamber (T) pass over to the air chamber (H) through to the openings (10) that enable air and water passage between said chambers (H, T). Water in the discharging chamber (T) passes into the air chamber (H) once the entire amount of air has passed through. The level of water in the discharging chamber (T) rises with air and water passages between the chambers (H, T), and the ball (7) submerges further down into water. This increases water pressure over the ball (7), and, under the impact of increased pressure, said ball bends the set (9). Meanwhile, the air chamber (H) is filled with a considerable amount of water.

[0019] The distance between the set (9) and the stopper (8) and the flexibility of the set (9) are evaluated so as to allow the ball (7) lean against the stopper (8) and close the discharging hole (4) without slipping out of said set (9). The ball (7) moves in this way, stretching the set (9), towards the stopper (8). At the end of the movement, the ball (7) touches the stopper (8) and the passage of air and water between the tub (2) and the hose (6) is blocked. Since the air chamber (H) fills with water before the ball (7) touches the stopper (8), there remains only a small amount of air inside the hose (6) (Figure 4 and Figure 5).

[0020] In one embodiment of the invention, the set (9) has a circular shape, encircling entirely the interior surface of the hose (6). A passage (G) is provided at the centre of the set (9), which enables water and air pass between the two chambers (H, T) and of which the width is less than the diameter of the ball (7). Said passage (G) allows the ball (7) to pass partly through. When the ball (7) leans against the set (9), the passage (G) there between is closed, and air and water passage between the chambers (H, T) is achieved only by way of the openings (12). Said openings (10) are positioned on the set (9) in the form of holes. Air discharging is maintained through these openings (10) provided on the set (9) (Figure 6).

[0021] In another embodiment of the invention, the openings (10) are in the form of slots extending from the centre of the hose (6) towards the interior wall thereof. Said openings (10) provide a fragmented constitution to the set (9) and, at the same time, enable air and water to pass through. Producing a mould for this type of set (9) is simpler than that for a set (9) comprising openings (10) thereon (Figure 7).

[0022] In one other embodiment of the invention, the opening (10) is in the form of a channel that enables air and water to pass from the in-between of the set (9) and the pump (5) to the in-between of the set (9) and the

stopper (8). This channel-shaped opening (10) opens by one end to the space between the set (9) and the stopper (8) and by the other end to the space between the pump (5) and the set (9). With this kind of opening (10), air and water passage is maintained from the exterior of the hose (6). Said opening functions like a bypass line between the space (H) in between the set (9) and the stopper (8) and the space (T) in between the pump (5) and the set (9) (Figure 8).

[0023] The washing machine (1) of the present invention maintains the ball (7) submerged further down in water inside the hose (6) and allows less air remain therein (6) before the ball (7) leans against the stopper (8). Therefore, a greater pressure force is obtained between the ball (7) and the stopper (8) and a better leakproofing between the tub (2) and the hose (6).

Claims

1. A washing machine (1) comprising a tub (2) wherein the washing process is performed, a drum (3) placed inside the tub (2), wherein laundry is loaded, an discharging hole (4) positioned at the bottom of the tub (2), through which water is discharged, a pump (5) which serves to mix tub (2) water into a wash cycle or to discharge water, a hose (6) connected by one end to the discharging hole (4) and by the other end to the pump (5), which conveys tub (2) water to the pump (5), a ball (7) positioned inside the hose (6) and which, under the impact of water pressure, opens and closes the discharging hole (4), a stopper (8) arranged at the extremity whereby the hose (6) is connected to the discharging hole (4), extending from the interior surface of the hose (6) towards the centre thereof, and which keeps the ball (7) from getting out through the discharging hole (4) when said ball leans there against; **characterized by** at least one flexible set (9) positioned between the stopper (8) and the ball (7), extending from the interior surface of the hose (6) in the direction of the centre thereof, and at least one opening (10) that enables air and water to pass from the in-between of the set (9) and the pump (5) to the in-between of the set (9) and the stopper (8) once the ball (7) touches said set (9).

2. A washing machine (1) as described in Claim 1, **characterized in that** the distance between the set (9) end the stopper (8) and the flexibility of the set (9) are chosen so as to allow the ball (7) lean against the stopper (8) and close the discharging hole (4) without slipping out of said set (9).

3. A washing machine (1) as described in Claim 1 or 2, **characterized by** openings (10) in the form of slots which divide the set (9) at least into two.

4. A washing machine (1) as described in any one of the above claims, **characterized by** channel-shaped openings (10).

5. A washing machine (1) as described in any one of the above claims, **characterized by** openings (10) provided over the set (9).

6. A washing machine (1) as described in Claim 1 or 2, **characterized by** the set (9) that encircles entirely the interior surface of the hose (6).

Patentansprüche

1. Waschmaschine (1), umfassend einen Laugenbehälter (2) in dem der Waschvorgang ausgeführt wird, eine Trommel (3), die im Laugenbehälter (2) angeordnet ist und in die Wäsche geladen wird, eine Ablassöffnung (4), die am Boden des Laugenbehälters (2) angeordnet ist und durch die Wasser abgelassen wird, eine Pumpe (5), die dazu dient, Wasser des Laugenbehälters (2) in einen Waschgang einzumischen oder Wasser abzulassen, einen Schlauch (6), der an einem Ende mit der Ablassöffnung (4) verbunden ist und an dem anderen Ende mit der Pumpe (5), und der Wasser des Laugenbehälters (2) zur Pumpe (5) leitet, eine Kugel (7), die im Schlauch (6) angeordnet ist und die unter der Einwirkung des Wasserdrucks die Ablassöffnung (4) öffnet und schließt, einen Anschlag (8), der an dem Ende angeordnet ist, an dem der Schlauch (6) mit der Ablassöffnung (4) verbunden ist, und sich von der Innenfläche des Schlauchs (6) zur Mitte desselben erstreckt, und der verhindert, dass die Kugel (7) aus der Ablassöffnung (4) austritt, wenn die Kugel darauf tritt; **gekennzeichnet durch** wenigstens einen flexiblen Einsatz (9), der zwischen dem Anschlag (8) und der Kugel (7) angeordnet ist und sich von der Innenfläche des Schlauchs (6) zu dessen Mitte hin erstreckt, und wenigstens eine Öffnung (10), die es erlaubt, dass Luft und Wasser von dem Raum zwischen Satz (9) und Pumpe (5) zu dem Raum zwischen Einsatz (9) und Anschlag (8) gelangen, sobald die Kugel (7) den Einsatz (9) berührt.

2. Waschmaschine (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** der Abstand zwischen dem Einsatz (9) und dem Anschlag (8) und die Flexibilität des Einsatzes (9) derart ausgewählt sind, dass die Kugel (7) auf den Anschlag (8) treffen kann und die Ablassöffnung (4) schließen kann, ohne aus dem Einsatz (9) zu rutschen.

3. Waschmaschine (1) nach Anspruch 1 oder 2, **gekennzeichnet durch** Öffnungen (10) in der Form von Schlitzen, die den Einsatz (9) mindestens in zwei Teile unterteilen.

4. Waschmaschine (1) nach einem der vorangehenden Ansprüche, **gekennzeichnet durch** kanalförmige Öffnungen (10).

5. Waschmaschine (1) nach einem der vorangehenden Ansprüche, **gekennzeichnet durch** Öffnungen (10), die über den Einsatz (9) hinweg vorgesehen sind.

6. Waschmaschine (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der Einsatz (9) die Innenfläche des Schlauchs (6) vollständig umgibt.

Revendications

1. Une machine à laver (1) comprenant une cuve (2) dans laquelle le processus de lavage est effectué, un tambour (3) placé à l'intérieur de la cuve (2), dans lequel le linge est chargé, un trou de décharge (4) positionné au fond de la cuve (2), par lequel l'eau est déchargée, une pompe (5) qui sert à mélanger l'eau dans la cuve (2) dans un cycle de lavage ou à décharger l'eau, un tuyau (6) relié par une extrémité au trou de décharge (4) et par l'autre extrémité à la pompe (5), qui transporte l'eau dans la cuve (2) à la pompe (5), une balle (7) placée à l'intérieur du tuyau (6) et qui, sous l'effet de la pression de l'eau, ouvre et ferme le trou de décharge (4), une butée (8) disposé à l'extrémité par laquelle le tuyau (6) est relié au trou de décharge (4), s'étendant de la surface intérieure du tuyau (6) vers le centre de celui-ci, et qui empêche la balle (7) de sortir par le trou de décharge (4) lorsque ladite balle se penche contre là-bas, **caractérisée par** au moins une barrière flexible (9) placé entre la butée (8) et la balle (7), s'étendant de la surface intérieure du tuyau (6) dans le sens du centre de celui-ci, et au moins une orifice (10) qui permet à l'air et l'eau de passer de l'entre-deux la barrière (9) et la pompe (5) à l'entre-deux la barrière (9) et la butée (8) dès que la balle (7) touche ladite barrière (9).

2. Une machine à laver (1) selon la Revendication 1, **caractérisée en ce que** la distance entre la barrière (9) et la butée (8) et la flexibilité de la barrière (9) sont choisis de manière à permette à la balle (7) de s'appuyer la butée (8) et fermer le trou de décharge (4) sans sortir de ladite barrière (9).

3. Une machine à laver (1) selon la Revendication 1 ou 2, **caractérisée par** les orifices (10) sous la forme de fente qui divisent la barrière (9) au moins en deux.

4. Une machine à laver (1) selon l'une quelconque des revendications précédentes, **caractérisée par** les orifices en forme de canal (10).

5. Une machine à laver (1) selon l'une quelconque des revendications précédentes, **caractérisée par** les orifices (10) fournies sur la barrière (9).

6. Une machine à laver (1) selon la Revendication 1 ou 2, **caractérisée par** la barrière (9) qui entoure entièrement la surface intérieure du tuyau (6).

Figure 1

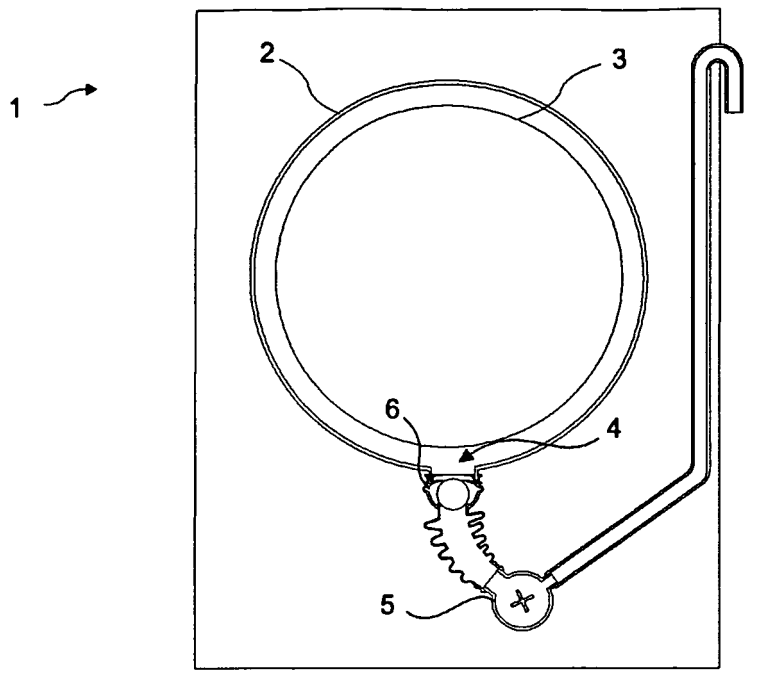


Figure 2

PRIOR ART

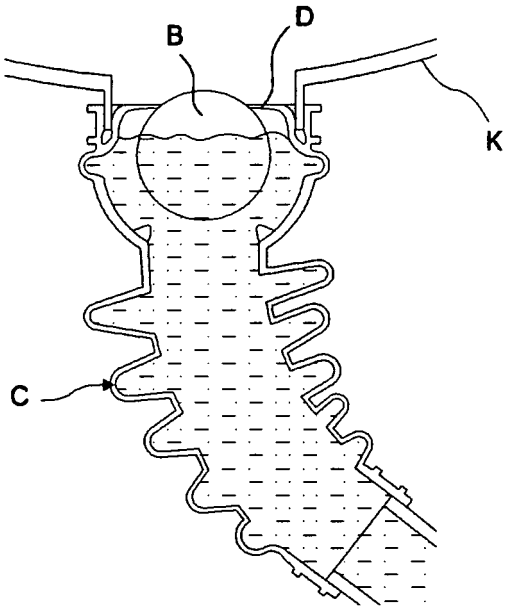


Figure 3

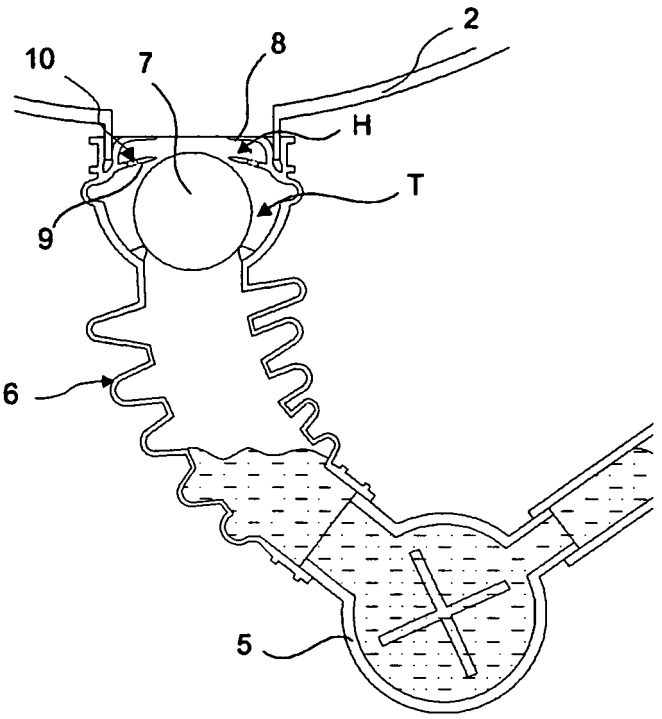


Figure 4

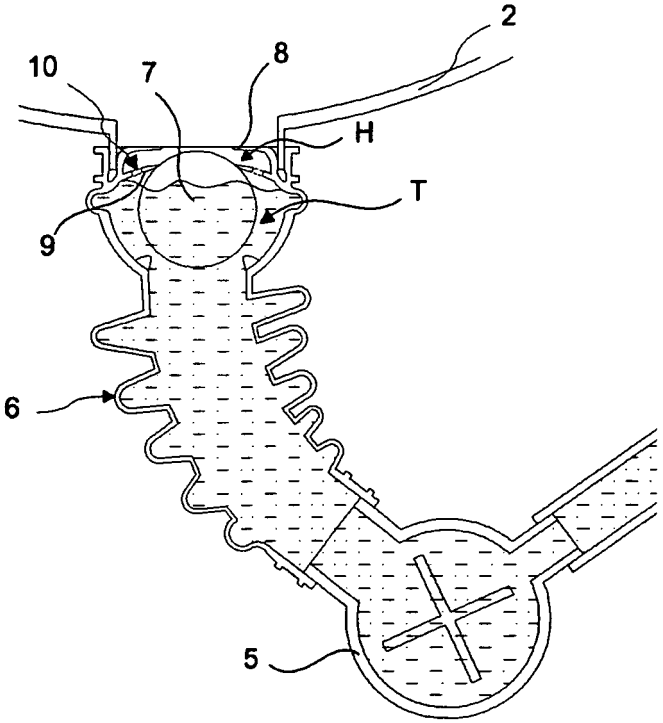


Figure 5

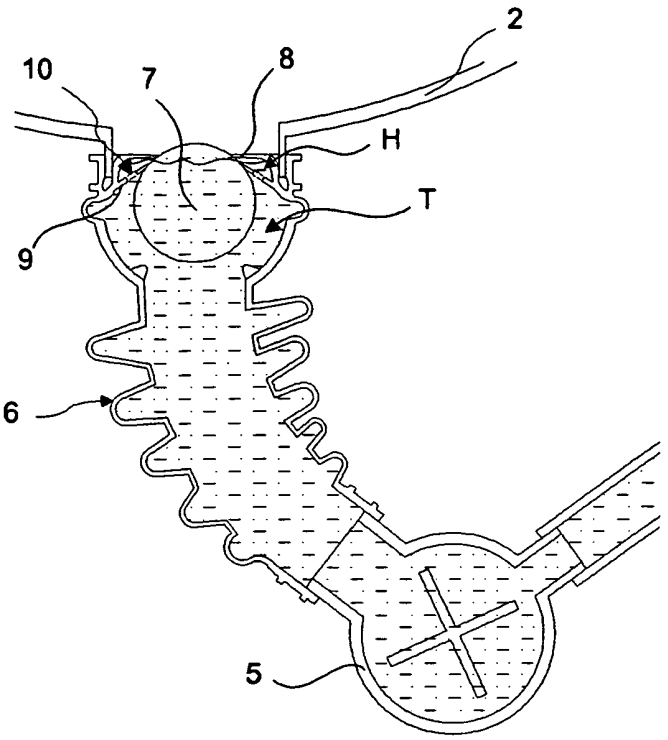


Figure 6

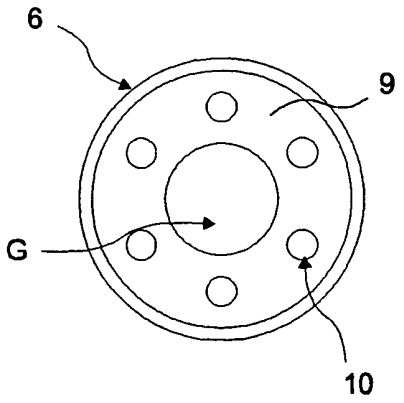


Figure 7

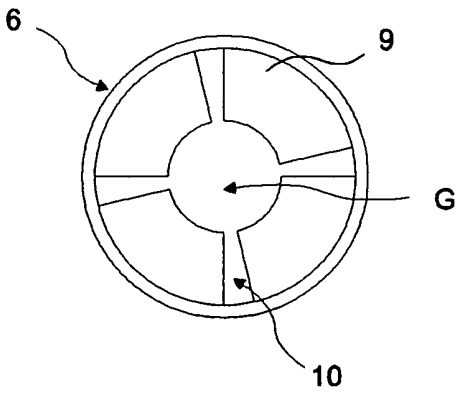
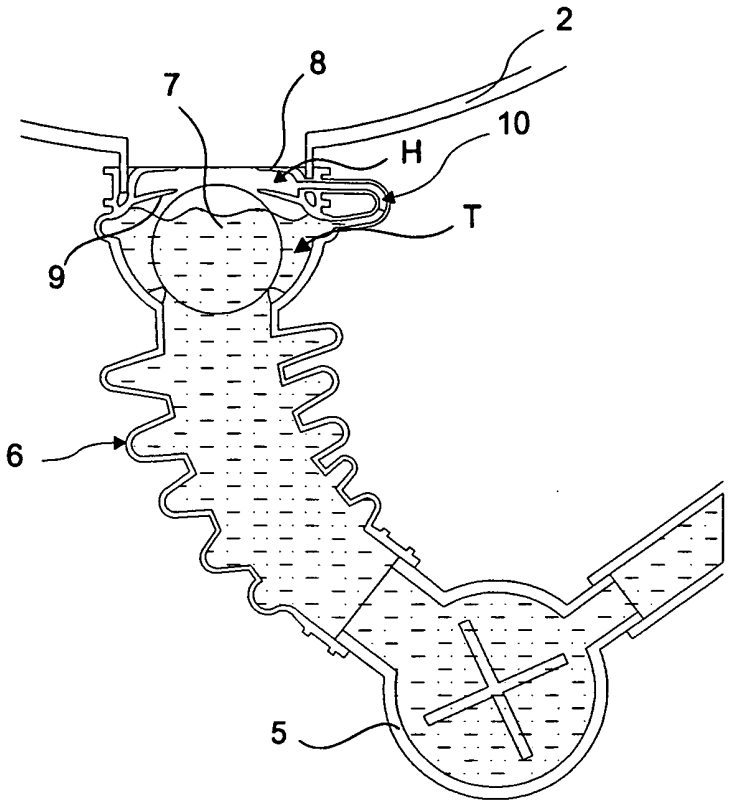


Figure 8



REFERENCES CITED IN THE DESCRIPTION

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