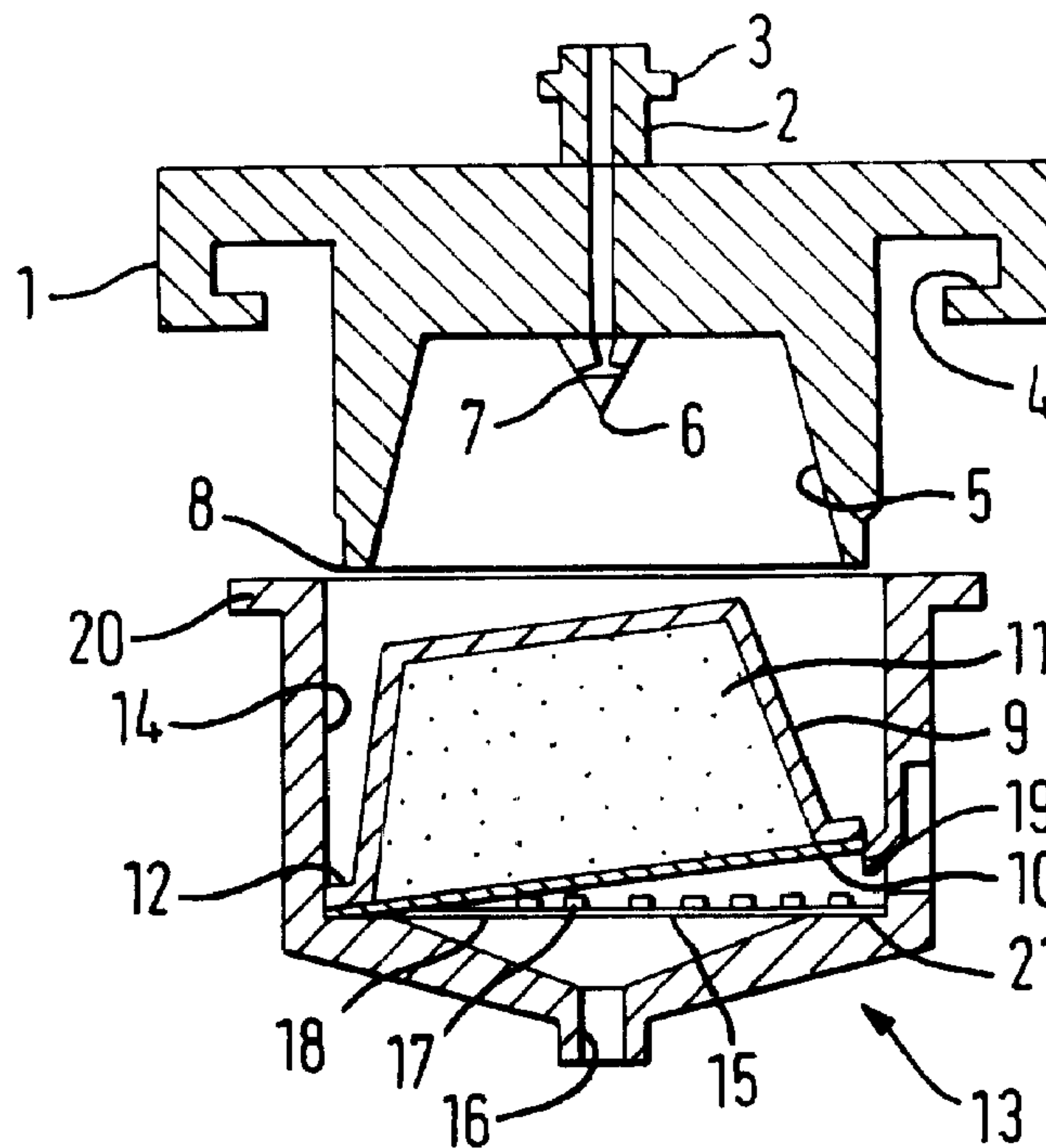




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(57) **Abrégé/Abstract:**

The invention relates to a device for making up a drink by extraction of a capsule comprising a cup (9) and a lip (12), this being arranged in a capsule-holder assembly for a coffee machine, the said device comprising - a substantially cylindrical capsule housing (1) which has an inner form (5) which substantially matches the outer form of the cup of the capsule for extraction and which includes, in its upper part, along the axis of the said cylinder, a member (6) for injecting water into the capsule and a means (2) providing a link with the water outlet of the said machine, and, in its lower part, an annular edge (8); and - a capsule-holder assembly (13) forming a cylindrical casing (14) and including a capsule-extraction plate (15) in the bottom of the said casing, the assembly being provided in order to be held under the capsule housing (1) so that the annular edge of the capsule housing interacts, during extraction, with the perimeter (21) of the extraction plate, and the lower part of the capsule-holder assembly includes, on the side and close to the extraction plate, at least one means (19) for retaining the lip of the capsule.

**Abstract****Device for making up a drink**

The invention relates to a device for making up a drink by extraction of a capsule comprising a cup (9) and a lip (12), this being arranged in a capsule-holder assembly for a coffee machine, the said device comprising

- a substantially cylindrical capsule housing (1) which has an inner form (5) which substantially matches the outer form of the cup of the capsule for extraction and which includes, in its upper part, along the axis of the said cylinder, a member (6) for injecting water into the capsule and a means (2) providing a link with the water outlet of the said machine, and, in its lower part, an annular edge (8); and
- a capsule-holder assembly (13) forming a cylindrical casing (14) and including a capsule-extraction plate (15) in the bottom of the said casing, the assembly being provided in order to be held under the capsule housing (1) so that the annular edge of the capsule housing interacts, during extraction, with the perimeter (21) of the extraction plate, and the lower part of the capsule-holder assembly includes, on the side and close to the extraction plate, at least one means (19) for retaining the lip of the capsule.

Fig. 1

**Device for making up a drink.**

The invention relates to a device for making up a drink by extraction of a capsule comprising a cup and a lip, this being arranged in a capsule-holder assembly for a coffee machine.

A device is already known which makes it possible to carry out extraction of a capsule in a pressurized device. Patent EP 242,556, in the name of the Applicant, relates to a device for making up a drink by extraction of a capsule in a capsule holder for a coffee machine and comprising a capsule housing interacting with a capsule holder. The drawback of this device is that the capsule housing includes, on its outer part, a ring and a spring which make it possible, after extraction from the capsule, to guarantee satisfactory release of the said capsule from the cylindrical body. The presence of this ring and of this spring make the device expensive, firstly because they involve the presence of two additional components and secondly because these components have to be fitted, which requires an assembly handling operation. Furthermore, they may become clogged during use and, in the worst case, cease to eject the capsule.

The object of the present invention is to be able to set up a system which makes it possible also to permit satisfactory release (or ejection) of the capsule after extraction, but with a simpler and thus less expensive and more reliable device.

The present invention relates to a device for making up a drink by extraction of a capsule comprising a cup and a lip, this being arranged in a capsule-holder assembly for a coffee machine, the said device comprising

- a substantially cylindrical capsule housing which has an inner form which substantially matches the outer form of the cup of the capsule for extraction and which includes, in its upper part, along the axis of the said housing, a member for injecting water into the capsule and a means providing a link with the water

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outlet of the said machine, and, in its lower part, an annular edge; and

- a capsule-holder assembly forming a cylindrical casing and including a capsule-extraction plate in the bottom of the said casing, the assembly being provided in order to be held under the capsule housing so that the annular edge of the capsule housing interacts, during extraction, with the perimeter of the extraction plate, and the lower part of the capsule-holder assembly includes, on the side and close to the extraction plate, at least one means for retaining the lip of the capsule.

It is thus possible, according to the present invention, to set up a capsule housing, for accommodating the capsule for extraction, which does not include a ring and a spring.

The procedure is as follows: the capsule for extraction is placed in the capsule holder. At this stage, the lip of the capsule rests via its own weight against the retention means. However, the weight alone is insufficient for the lip of the capsule to pass over the retention means. The capsule holder is then inserted into the capsule housing. During this movement, or at the latest, during locking of the capsule holder to the cylindrical body, the lip of the capsule is forced past the retention means. This takes place in two possible ways: either without plastic deformation of the capsule but with elastic deformation of the retention means, or with plastic deformation of the capsule and without elastic deformation of the retention means. The coffee machine is then turned on in order to extract the capsule and to obtain the desired drink. After extraction, the capsule holder is unlocked. At this stage, the capsule is wedged in the capsule housing and the retention means, which is secured to the capsule holder, bears on the lip of the capsule without yielding. When the capsule holder is removed manually, the capsule is entrained and therefore ejected from the capsule housing. It then

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suffices to turn the capsule holder upside down in order to cause the used capsule to fall out: owing to the fact that the retention means is arranged only on one side, the capsule can tilt on the opposite side and  
5 release itself from the said retention means. The retention means thus makes it possible to readily release the capsule from the capsule housing but, as this retention means extends over only part of the perimeter of the extraction plate, it is possible then  
10 to make it fall easily into a waste container.

As mentioned above in the case of the description of the operating method, it may be advantageous for the retention means to have a degree of elasticity; it is consequently preferable for this  
15 retention means to be, for example, made from plastic material or from rubber, or from any other elastic material.

The retention means is placed in the bottom of the capsule-holder casing, at extraction-plate level,  
20 on the vertical part of the said casing. In a preferred embodiment, there are two retention means in the form of a lug forming an arc of a circle, each lug having a width such that it forms an arc of a circle having an angle of less than  $30^\circ$ , preferably less than  $10^\circ$ . In a  
25 further embodiment, the retention means has the form of a rim in the form of an arc of an off-centred circle having a size such that the said arc of a circle has an angle of less than  $180^\circ$ , preferably less than  $90^\circ$ .

The capsule-extraction plate has the form of a  
30 plate with raised elements and hollowed-out elements with holes for the flow of coffee. The raised elements are, for example, pyramids or frustums of a pyramid; in this embodiment, the capsule for extraction has a cup and a lip with a cover which has no weakening line.  
35 During extraction, it is the rise in pressure in the capsule which causes the cover to be pressed against the raised elements and which gives rise to tearing of the said cover against the said raised elements.

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The extraction plate may also have the form of a plate with only flow holes. In this case, the capsule for extraction always has a cup, a lip and a cover, but the cover has weakening zones to allow extraction under  
5 pressure.

The capsule-holder assembly may have the form of a single component or of two components. In the former case, the capsule holder includes the capsule-extraction plate and the means for retaining  
10 the lip of the cover forms an integral part of the capsule holder itself. In the latter case, the capsule-holder assembly comprises the actual capsule holder, a plate support placed in the said capsule holder and the capsule-extraction plate. The plate  
15 support is normally conical in form towards the bottom and cylindrical in form towards the top, the means for retaining the lip of the capsule being in the said cylindrical part. The description of the figures will give a specific representation of this type of  
20 arrangement.

The means linking the cylindrical body with the water outlet of the machine is a bayonet system, which greatly facilitates assembly and dismantling of the said cylindrical body.

25 As already mentioned above, the retention means must be made from an elastic material: the simplest solution is thus to make the entire capsule-holder assembly from plastics material, possibly also the cylindrical body. Compared with a capsule holder made  
30 from metal, this has the further consequence that the cost of the machine is genuinely reduced. Polyamide, for example, is envisaged as the plastics material.

The remainder of the description is given with reference to the figures, in which:

35 Fig. 1 is a simplified sectional view of the device according to the invention, in a first embodiment;

Fig. 2 is the same sectional view, but at the time of extraction;

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Fig. 3 is still the same sectional view at the moment of release (ejection) of the extracted capsule;

Fig. 4 is a simplified sectional view of the device according to the invention, in a second  
5 embodiment;

Fig. 5 is a sectional view of the support plate;

Fig. 6 is a top view of the support in Fig. 5 with the extraction plate; and

10 Fig. 7 is a diagrammatic representation according to a third embodiment.

The device according to the invention comprises a capsule housing (1) comprising a means (2) for linking with the water outlet (not shown) of the coffee  
15 machine; this linking means is of the bayonet type (3) and it is thus easily secured to the coffee machine as it is. This capsule housing also comprises, on the periphery, tightening ramps (4) and a hollow part (5) which has a form which substantially matches the outer  
20 form of the capsule for extraction. The substantially cylindrical or frustoconical hollow part (5) comprises an annular edge (8) in its lower part. The hollow part finally comprises a water-injection member (6) pierced with upwardly facing holes (7).

25 The capsule for extraction comprises a cup (9), a cover (10) and a lip (12), and it contains roasted, ground coffee (11).

This capsule is placed in a capsule-holder assembly (13) with a capsule casing (14) of  
30 substantially cylindrical shape, the capsule being in the said capsule casing. The capsule-holder assembly includes a plate (15) for extraction of the capsule (9), comprising raised elements (17) and hollow elements and holes (18) for the passage of the coffee.  
35 The capsule-holder assembly also comprises a hole (16) which allows the coffee to be discharged into the cup during extraction of the capsule (9) and tightening lugs (20) provided so as to engage in the tightening ramps (4) of the capsule housing. In this embodiment,

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the capsule-holder assembly is in a single component. As already mentioned above, the object of the invention is to provide, inside the capsule-holder assembly, a means (19) for retaining the lip (12) of the capsule.

5 This means extends slightly towards the centre in relation to the cylindrical wall formed by the casing (14). Moreover, it must also extend over a certain arc of a circle; the arc of a circle thus defined must come to a compromise in order to satisfactorily hold the lip

10 of the capsule and, moreover, to guarantee that, after extraction, the said lip may be released without too much difficulty and thus allow satisfactory ejection. Preferentially, an arc of a circle is chosen which has an angle of between 5 and 40°. It is readily understood

15 that the extension towards the centre may not exceed the width of the lip of the capsule.

The procedure is as follows: the capsule (9) is placed in the capsule-holder assembly (13). The lip (12) of the said capsule rests against the retention

20 means (19). The capsule-holder assembly is then inserted via its tightening lugs (20) on the tightening ramp (4) of the capsule housing (1). The lip (12) of the capsule is then forced past the retention means (19); this position is shown in Figure 2. This can take

25 place by virtue of the elasticity of the retention means (19). The machine is now ready for extracting the capsule. The seal is provided by the lip (12) of the capsule being pinched between the annular edge (8) of the capsule housing and the perimeter (21) of the

30 extraction plate (15).

Figure 3 shows only the capsule-holder assembly (13) at the moment of release (ejection) of the extracted capsule (9). The capsule-holder assembly is removed from the capsule housing and turned over. As

35 the retention means (19) extends only over a limited part of the circumference of the casing (14), the capsule is able to drop out of the said casing (14) under gravity. The capsule includes an opening (22)

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made by the water-injection member (6) and the cover (10) is torn along (23) over the raised elements (17).

Figure 4 shows a second embodiment of the device according to the invention in which the capsule-holder assembly is in two parts, the figure showing only the plate support (24) and the capsule-extraction plate (25), and not showing the presence of a capsule for extraction. The capsule housing (28) comprises the casing (35) for the capsule for extraction as well as the water-injection member (29) with the holes (30) and the annular edge (33). The extraction plate (25) comprises the raised elements (31) and the hollowed-out elements (36). The hollowed-out elements contain the holes (32) which allow the passage of the coffee. The annular edge (33) of the cylindrical body interacts with the perimeter (34) of the extraction plate (25) in order to guarantee the seal during extraction of the capsule.

The plate support (24) comprises a lower conical part A and an upper cylindrical part B. The part B is made so as to be accommodated in the capsule holder as it is. The part B comprises holding lugs (26) and (27) which are uniformly distributed over the ring of the said plate support (24). The lugs (26) include a stop (37) permitting holding of the extraction plate (25) in the casing of the capsule-holder assembly. The lugs (27) include the means (38) for retaining the capsule lip. It is possible to have either one or two of these retention means. In the figure, the retention means forms an arc of a circle with an angle  $x$ . In the present case this angle is  $20^\circ$ .

Figure 6 is a diagrammatic top view in which it is possible easily to see the plate support (24) and the extraction plate (25). This plate (25) comprises a perimeter (34) guaranteeing the seal during extraction. In this figure, it is easy to see the 7 holding lugs (26) and the two holding lugs (27) including the two retention means (38). The handle (40) of the capsule-holder assembly has been indicated by a dotted

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line. Normally, the retention means (38) are arranged opposite the handle (40) so as to guarantee satisfactory release of the capsules both in the case of right-handed users and in the case of left-handed users.

Figure 7, finally, shows a third embodiment of the device according to the invention. In this figure it is possible to see the entire device composed of the capsule housing (41) comprising a water-injection member (53) and tightening ramps (51), and the cartridge holder (42) and the cartridge (43) for extraction. The cartridge holder (42) comprises the handle, the casing (45), the extraction plate (46) and the tightening lugs (52) provided so as to engage on the tightening ramp (51). The lower part of the casing (45) comprises a rim (47) forming the means for retaining the lip (48) of the cartridge (43). The extraction plate (46) comprises raised elements (49) and holes (50) allowing the capsule to be opened and coffee to pass through during extraction from the capsule (43).

It will be seen that the rim (47) extends on either side of the handle (44). This rim must not extend over an arc of a circle of more than 180° and preferably extends over an arc of a circle with an angle of approximately 90°.

The advantage of this version is simplicity. The capsule holder (42) can be produced by injection, as a single piece. The injected material is either a metal, for example aluminium, or a hard, rigid plastic.

**Claims**

1. Device for making up a drink by extraction of a capsule comprising a cup and a lip, this being arranged in a capsule-holder assembly for a coffee machine, the said device comprising
- 5
- a substantially cylindrical capsule housing which has an inner form which substantially matches the outer form of the cup of the capsule for extraction and which includes, in its upper part, along the axis of the said cylinder, a member for injecting water into the capsule and a means providing a link with the water outlet of the said machine, and, in its lower part, an annular edge;
  - 10 and
  - a capsule-holder assembly forming a cylindrical casing and including a capsule-extraction plate in the bottom of the said casing, the assembly being provided in order to be held under the capsule housing so that the annular edge of the capsule housing interacts, during extraction, with the perimeter of the extraction plate, and the lower part of the capsule-holder assembly includes, on the side and close to the extraction plate, at least one means for retaining the lip of the capsule.
  - 15
  - 20
  - 25
2. Device according to Claim 1, comprising at least two retention means in the form of a lug forming an arc of a circle, each lug having a width such that it forms an arc of a circle having an angle of less than 30°, preferably less than 10°.
- 30
3. Device according to Claim 1, in which the retention means has the form of a rim in the form of an arc of a circle having a size such that the said arc of a circle has an angle of less than 180°.
- 35
4. Device according to one of Claims 1 to 3, in which the capsule-extraction plate has the form of a plate with raised elements and hollowed-out elements with holes for the flow of coffee.

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5. Device according to one of Claims 1 to 3, in which the extraction plate has the form of a plate with flow holes.
6. Device according to one of Claims 1 to 5, in  
5 which the capsule-holder assembly has the form of a single component.
7. Device according to one of Claims 1 to 5, in which the capsule-holder assembly has the form of two components, namely the capsule holder and a plate  
10 support accommodated in the said capsule holder.
8. Device according to one of Claims 1 to 7, in which the means linking the cylindrical body with the water outlet of the machine is a bayonet system.
9. Device according to one of Claims 1 to 8, in  
15 which the capsule housing and the capsule-holder assembly are made from plastics material.

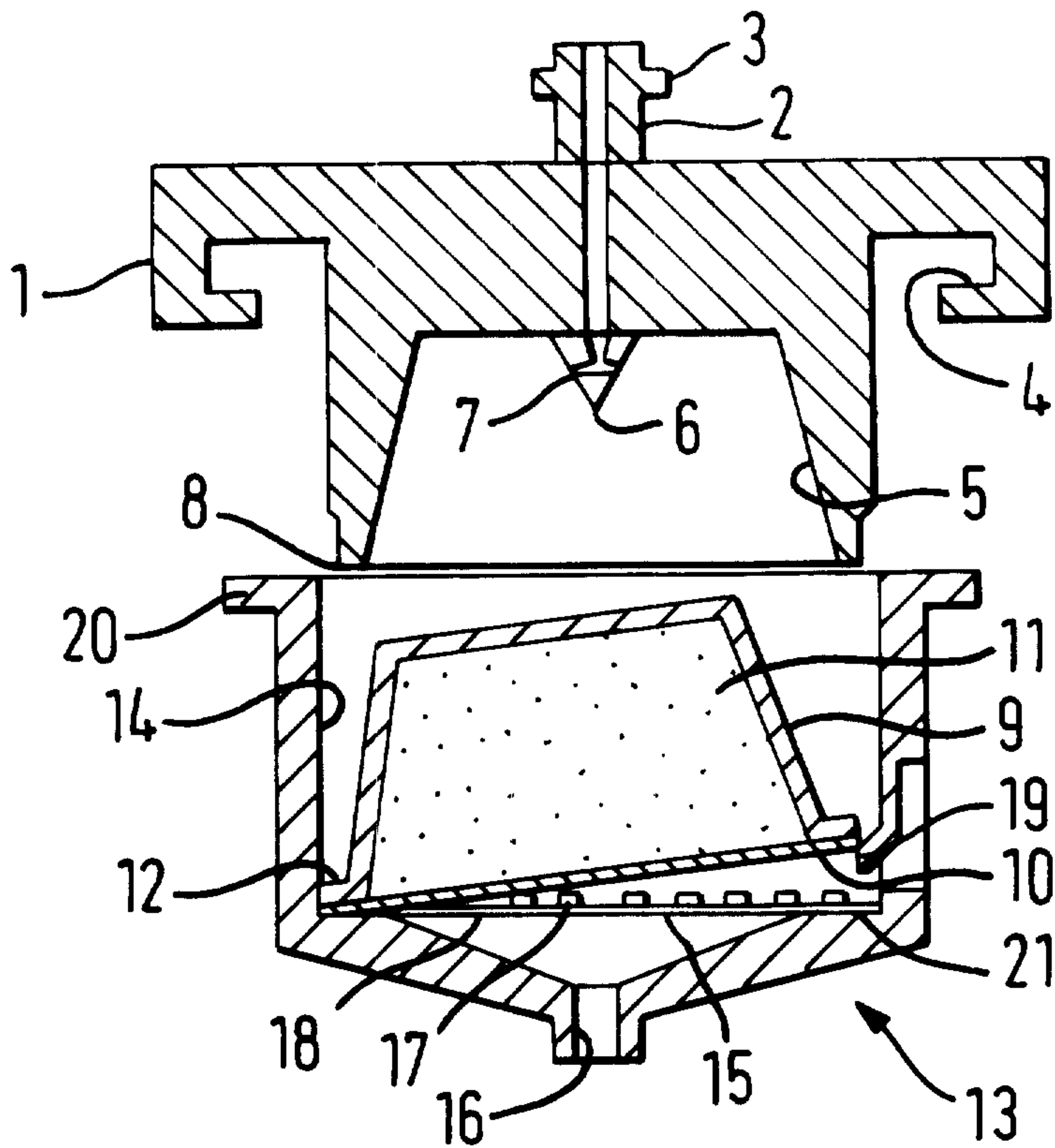


FIG. 1

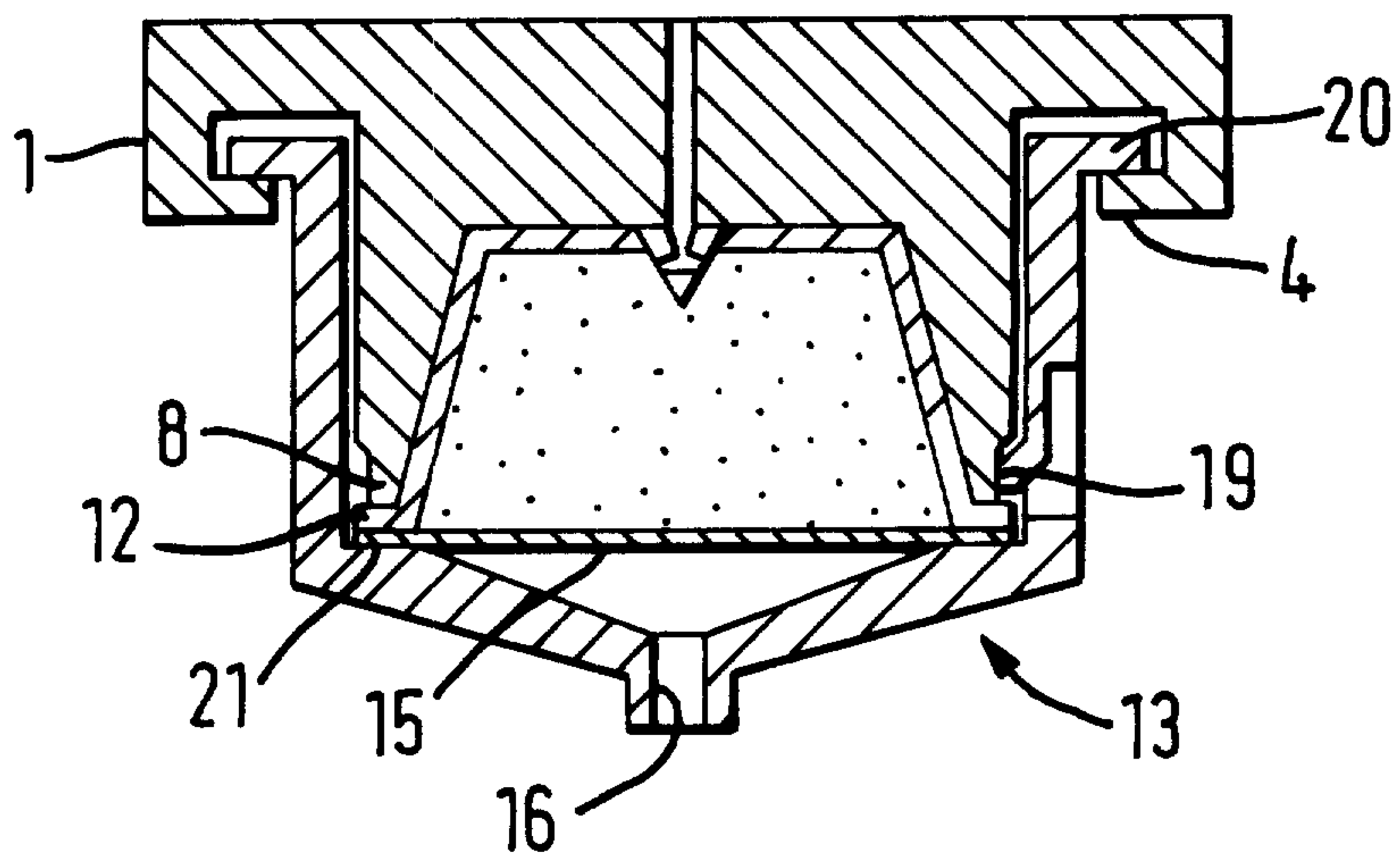


FIG. 2

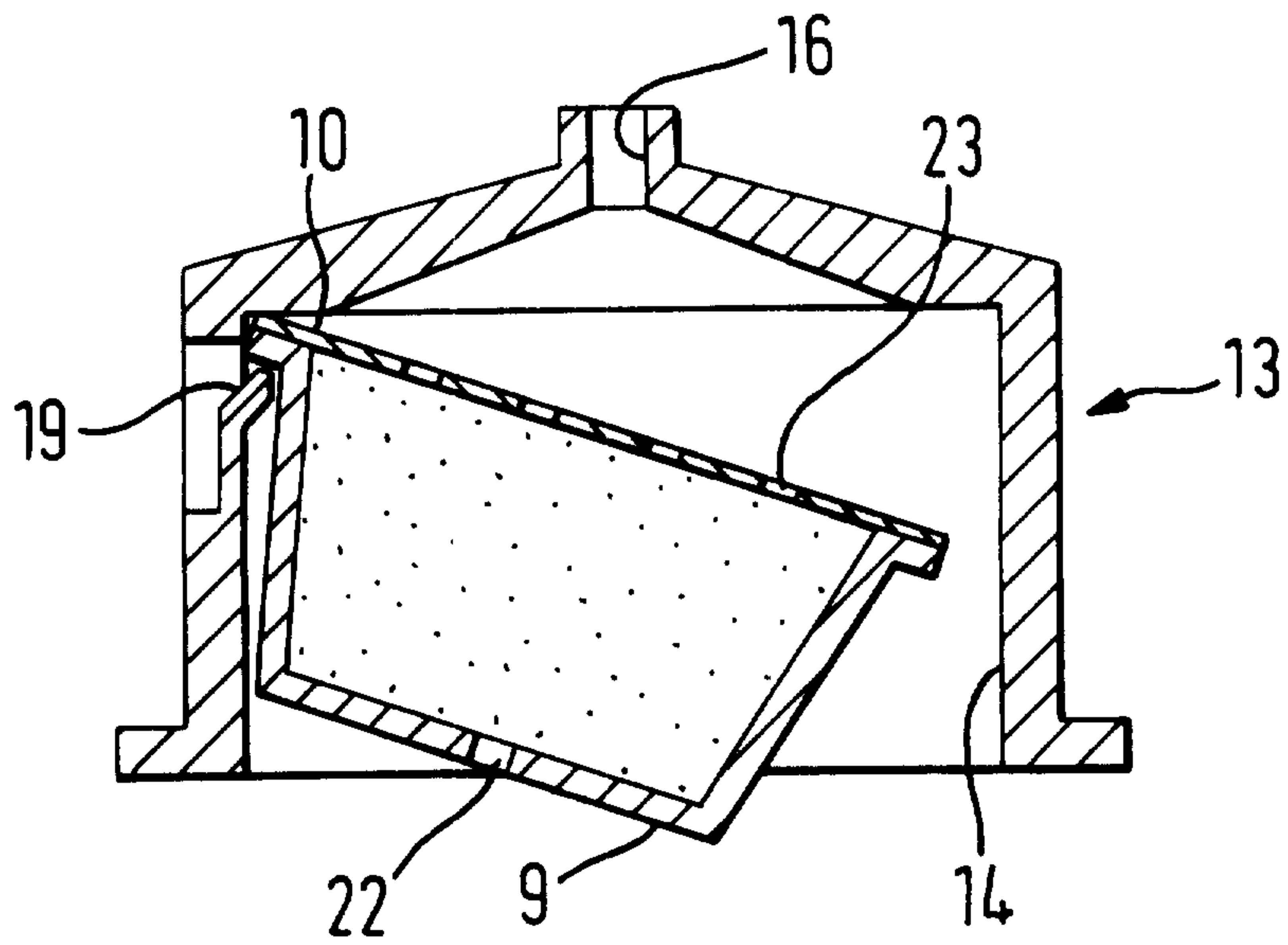


FIG. 3

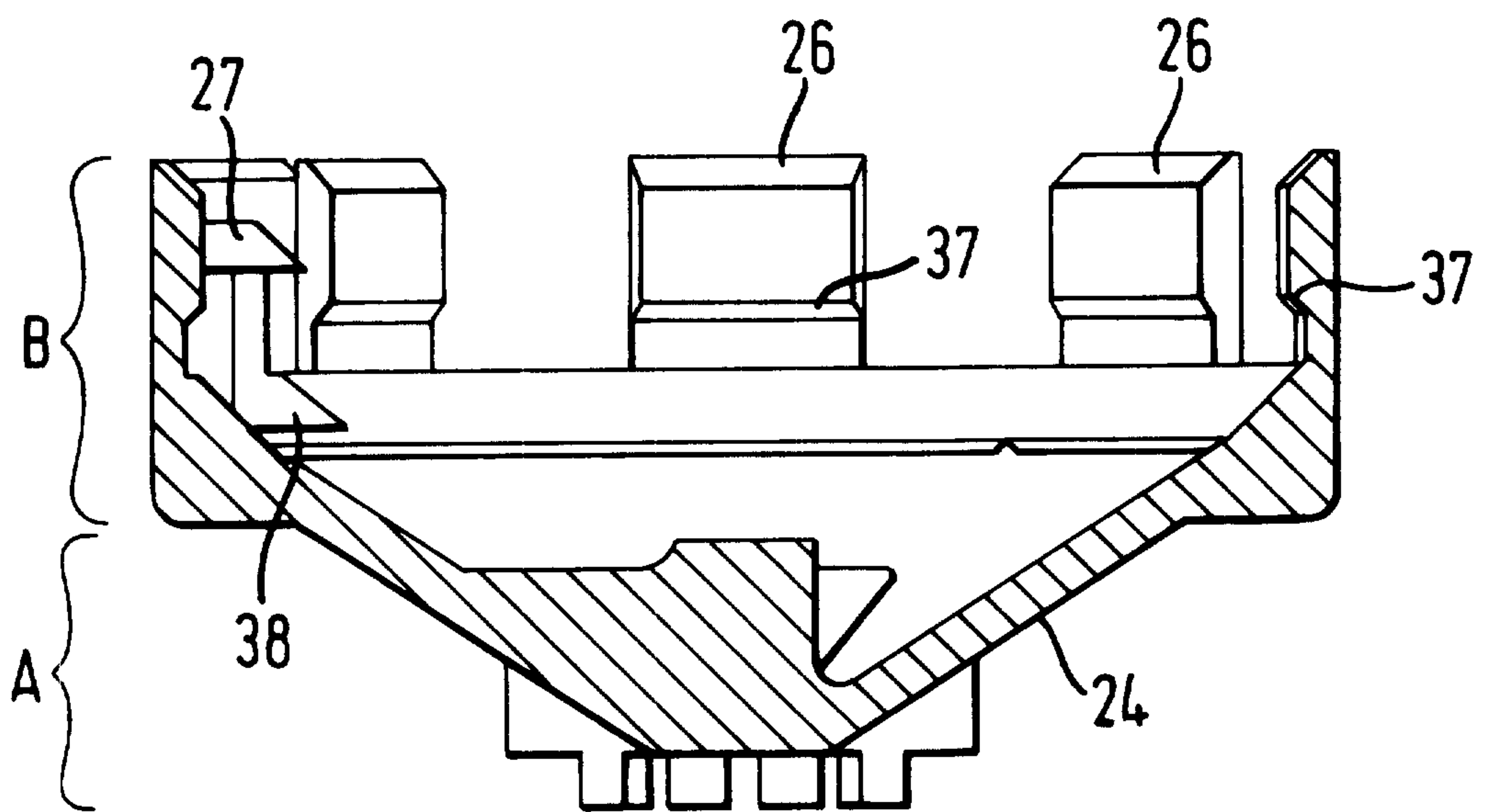


FIG. 5

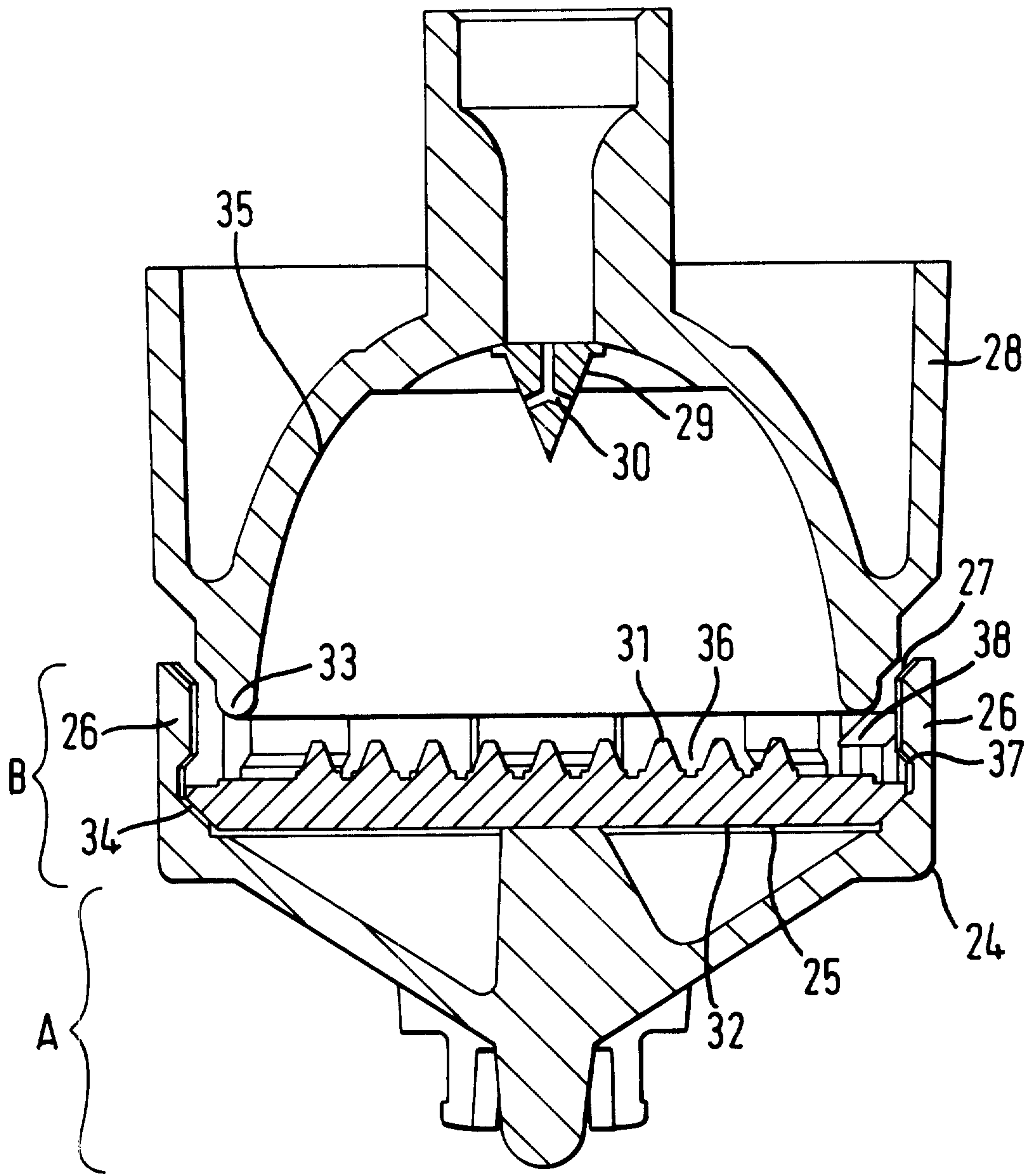


FIG. 4

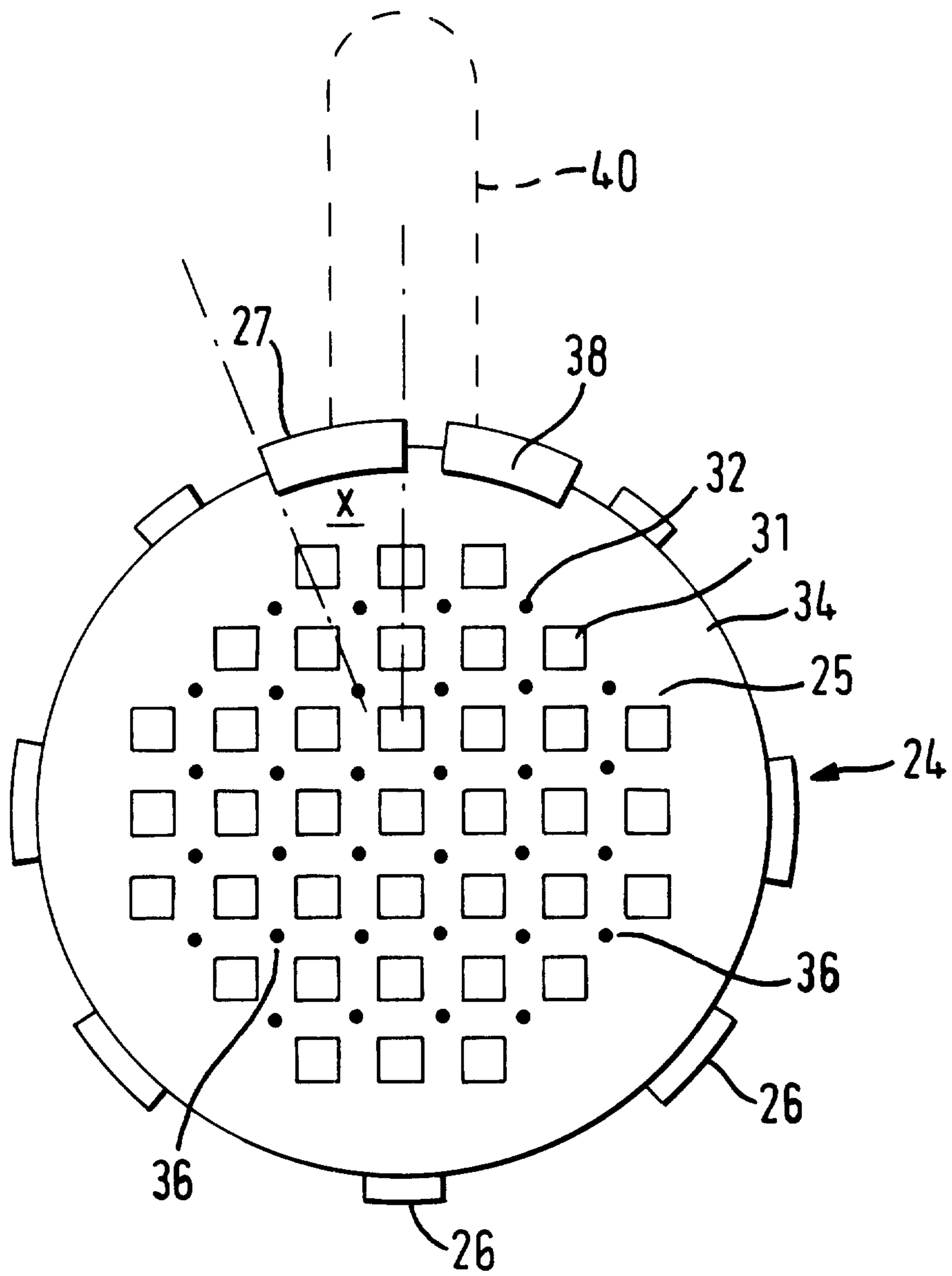


FIG. 6

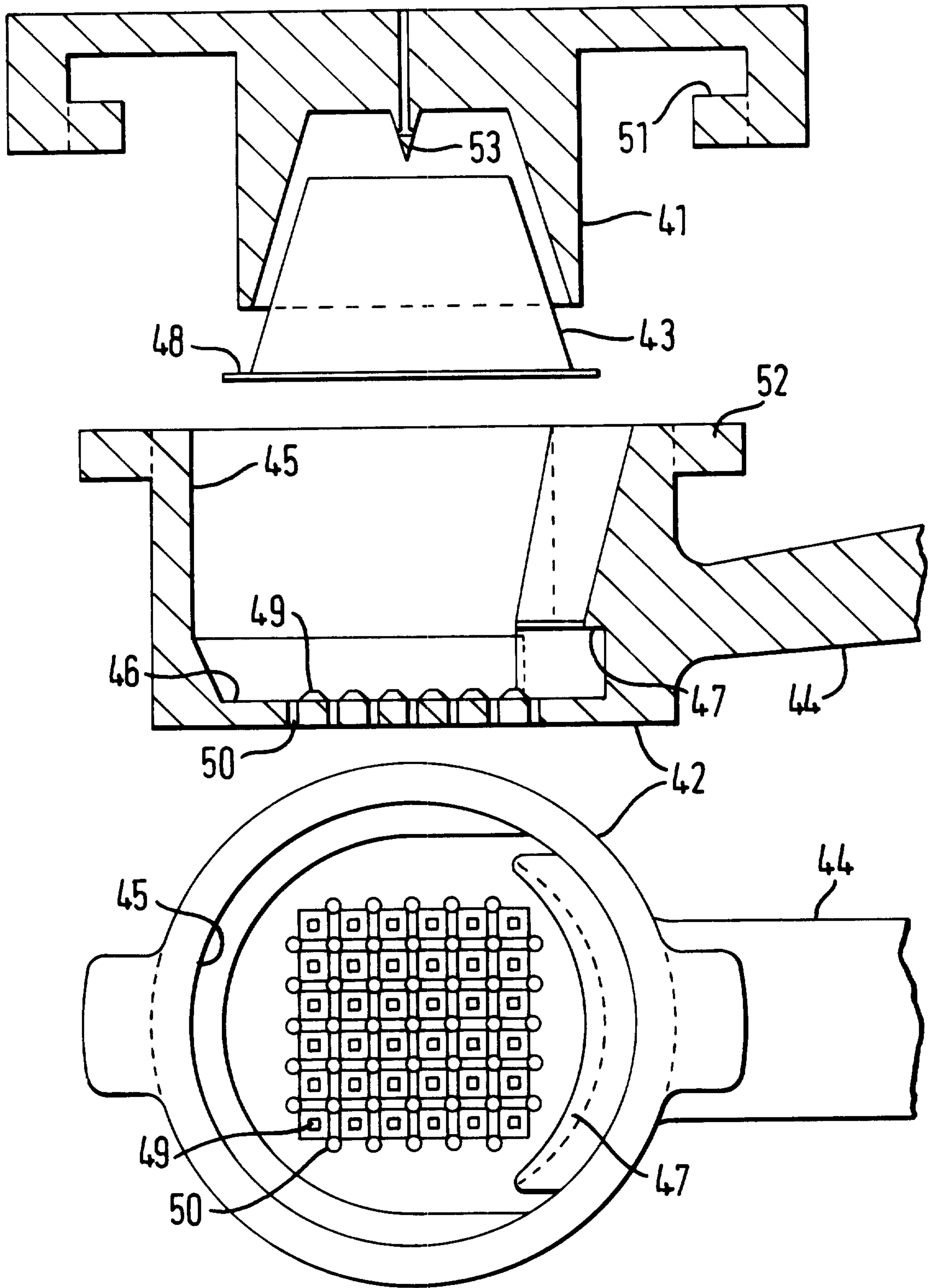


FIG. 7

