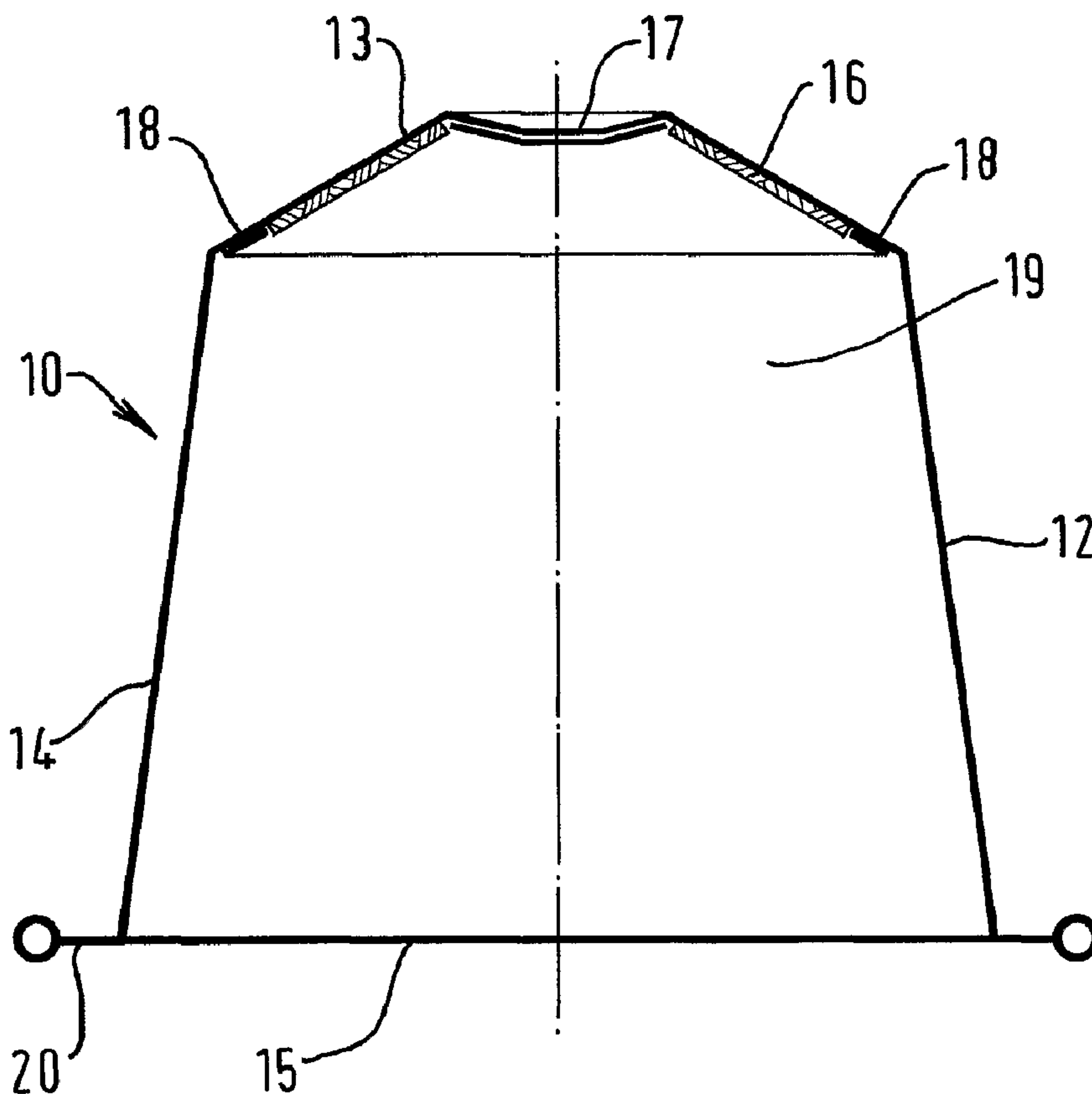




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(54) Titre : CARTOUCHE FERMEE POUR PREPARER UNE DE BOISSON, POUR EXTRACTION SOUS PRESSION  
 (54) Title: CLOSED CARTRIDGE FOR PREPARING A BEVERAGE, FOR EXTRACTION UNDER PRESSURE



(57) Abrégé/Abstract:

The present invention relates to a closed cartridge (10), for extraction under pressure, comprising a dish (12) with a bottom (13) with a central part and a peripheral part and a side wall having substantially the shape of a frustum of a cone and a circular edge

(57) **Abrégé(suite)/Abstract(continued):**

with a diameter greater at the bottom and a cover (15) welded to the periphery of the edge of the dish and the cover is intended to be torn only through the effect of the force of the extraction fluid when extraction starts, the said cartridge comprising, in the dish at the level of the bottom, a means (16) guaranteeing retention of the solid substance when it is opened, in which the means guaranteeing retention of solid substance is a sheet of fabric sealed in the bottom of the dish in two zones, on the one hand in the central part (17) and on the other hand in the peripheral part (18) of the said bottom (13).

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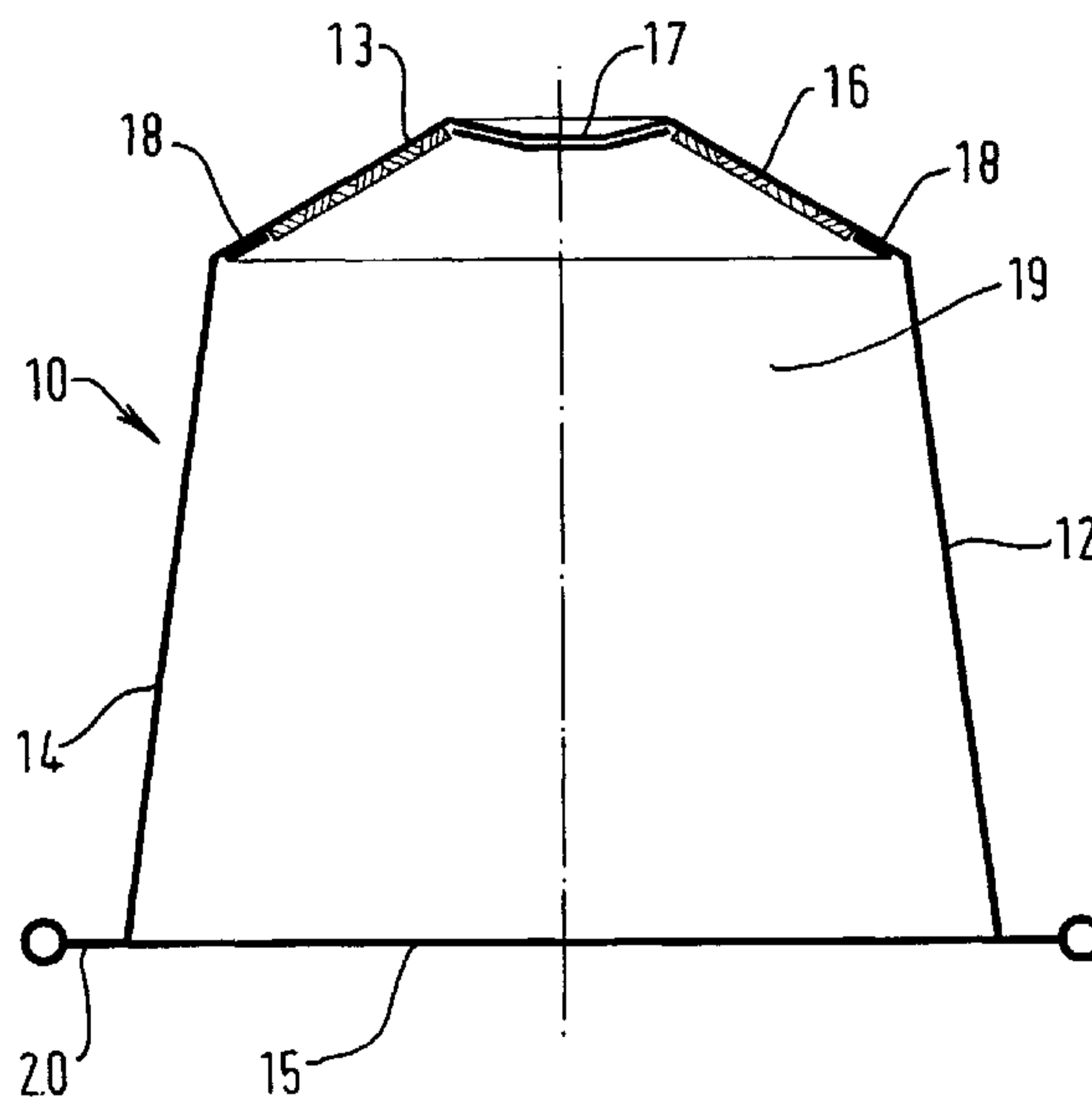
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- (75) Inventors/Applicants (for US only): **MASEK, Petr** For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CLOSED CARTRIDGE FOR PREPARING A BEVERAGE, FOR EXTRACTION UNDER PRESSURE



(57) Abstract: The present invention relates to a closed cartridge (10), for extraction under pressure, comprising a dish (12) with a bottom (13) with a central part and a peripheral part and a side wall having substantially the shape of a frustum of a cone and a circular edge with a diameter greater at the bottom and a cover (15) welded to the periphery of the edge of the dish and the cover is intended to be torn only through the effect of the force of the extraction fluid when extraction starts, the said cartridge comprising, in the dish at the level of the bottom, a means (16) guaranteeing retention of the solid substance when it is opened, in which the means guaranteeing retention of solid substance is a sheet of fabric sealed in the bottom of the dish in two zones, on the one hand in the central part (17) and on the other hand in the peripheral part (18) of the said bottom (13).



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**Closed cartridge for preparing a beverage, for extraction under pressure**

The present invention relates to a sealed cartridge,  
5 for extraction under pressure, containing a substance  
for the preparation of a beverage chosen from ground  
roasted coffee, tea, instant coffee, a mixture of  
ground coffee and of instant coffee, a chocolate based  
product or any other dehydrated edible substance,  
10 comprising a dish with a bottom with a central part and  
a peripheral part and a side wall, having substantially  
the shape of a frustum of a cone, and a circular edge  
with a diameter greater at the bottom, and a cover  
welded to the periphery of the edge of the dish, and  
15 the cover is intended to be torn only through the  
effect of the force of the extraction fluid when  
extraction starts, the said cartridge comprising, in  
the dish at the level of the bottom, a means  
guaranteeing retention of the solid substance when it  
20 is opened.

Another invention of the Applicant relates to a capsule  
cage (or cartridge), capable of being mounted in a coffee  
25 machine, comprising a first part with a channel for the  
supply of water and a second part forming a housing for  
the capsule for extraction, in which a perforation system  
independent of the water-supply channel is provided  
directly at the exit from the said channel. The cartridge  
30 with the means for retention of solid substance, as  
mentioned above, is insufficient to guarantee complete  
cleanliness when changing cartridges.

It is desirable to perfect a cartridge provided for the  
35 extraction cage as mentioned above and which does not lead  
to leaks of grounds or of any other solid substance when  
the said cartridge is changed.

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The present invention relates to a closed cartridge according to the preamble of Claim 1, in which the means guaranteeing retention of solid substance is a sheet of fabric sealed in the bottom of the dish over  
5 two areas, on the one hand in the central part and, on the other hand in the peripheral part of the said bottom. Sealing over the peripheral part of the bottom may be effected over the periphery as a whole or only over a portion of the said periphery. It involves  
10 arranging, in each cartridge, a non-return system for the coffee grounds or for any other solid substance extracted in the said cartridge. This system must suit the construction of the extraction head of the capsule cage described above.

15 The fabric used according to the invention has, on the one hand, an acceptable cost and, on the other hand, is simple to produce, allowing easy opening of the capsule by the injection points, being satisfactorily resistant  
20 to hot water and providing satisfactory closure after extraction, i.e. when the cartridge is removed.

The fabric used may be any type of fabric, woven or non-woven, made from plastic fibres, from vegetable  
25 fibres or from animal fibres. The fabric used is preferably fabric made from polypropylene, polyester, polyurethane, polyamide or cellulose having a thickness of between 15 and 200 microns. The fabric is hot-sealed in the aforesaid two zones in the bottom of the dish.

30 The cover is heat-welded or crimped to the periphery of the dish. A cartridge which can withstand the pressures which may range up to 15 bar in the extraction system is thereby obtained.

35 The cartridge is filled with a substance for the preparation of a beverage, as mentioned above. This substance is preferably ground roasted coffee.

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"Dish" is understood to mean a frustoconical, hemispherical or frustopyramidal element. Naturally, the bottom of the dish does not have to be flat.

5 The principal body of the cartridge, namely the dish, of frustoconical shape and of semi-rigid nature, may consist of a material chosen from aluminium having a thickness of 20 to 100  $\mu\text{m}$ , a pure or multi-layer plastic, a cardboard/aluminium/plastic composite and a  
10 cardboard/plastic composite.

The cover of the cartridge, of flexible nature, may be made from a material chosen from aluminium with a thickness of 15 to 60  $\mu\text{m}$  and a multi-layer material  
15 comprising either paper of 20 to 60  $\text{g}/\text{m}^2$ , plastic of a thickness of 20 to 60  $\mu\text{m}$  and aluminium with a thickness of 5 to 20  $\mu\text{m}$ , or EVOH or PVDC of a thickness of 5 to 30  $\mu\text{m}$  and plastic (PP, PE or PA) of 20 to 100  $\mu\text{m}$ , or PET (5 to 30  $\mu\text{m}$ ) and plastic (PP, PE) of 20 to 100  $\mu\text{m}$ ,  
20 or PET that is metallized or equipped with a layer which forms an efficient barrier, such as  $\text{SiO}_2$ .

The size of the cartridge according to the invention may vary according to the volume of coffee it is  
25 desired to prepare. The measure of coffee may vary between 5 and 20 g, the diameter of the cartridge is between 2.5 and 6 cm and the thickness of the bed of coffee between 10 and 40 mm.

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

Figure 1 is a diagrammatic representation of the cartridge according to the invention; and  
35 Figure 2 is a partial section of the capsule cage for the extraction of the cartridge of Figure 1.

The solution of the invention, according to Figure 1, is to provide, in the cartridge (10) having a dish (12)

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with bottom (13) and side wall (14), with a circular edge (20) and a cover (15), a layer of fabric (16) made from polyurethane having a thickness of 60 microns in the bottom (13). This layer is sealed over two zones of the bottom of the dish, namely in the central part (17) and in the peripheral part (18) of the said bottom. Sealing is effected over the entire periphery of the bottom. The bed of coffee (19) is deposited on the fabric (16). The cartridge shown contains 5 g of coffee and it has a diameter of 35 mm and a coffee-bed thickness of 30 mm. Sealing of the central part is effected over a diameter of the order of 8 mm and that of the peripheral part over a width of the order of 1-2 mm.

15 The capsule cage (1) according to Figure 2 comprises a thread (2) so that it can be screwed onto the coffee machine. The housing (3) is required so that a gasket can be arranged on it, allowing satisfactory sealing of the system. The channel (4) allows the supply of water into the housing (5) of the capsule. Directly at the exit from the channel (4) is the perforation system (6) consisting of three points with apertures (9).

25 When it is desired to extract the cartridge of Figure 1, it is placed in the housing (5) of the capsule cage (1). The points (6) will nick the bottom of the dish and perforate or push back the fabric between the two sealing zones (17) and (18). The advantage of this fabric is that it is resistant to perforation and the water passes through the said fabric and, even if the fabric is perforated anyway, at the end of extraction its flexibility and its elasticity enables it to re-close when the said points are removed from the cartridge, and the grounds do not emerge via the nicks. A cartridge guaranteeing satisfactory cleanliness of the extraction system is thus provided.

**CLAIMS:**

1. A sealed cartridge, for extraction under pressure, containing a dry edible substance for the preparation of a beverage, said cartridge comprising:
  - a dish having:
    - a bottom with a central part and a peripheral part, and
    - a side wall, substantially in the shape of a frustum of a cone, having a substantially circular top edge, said top edge having a diameter greater than the diameter of a bottom of the side wall;
  - a cover, sealed to the top edge, wherein, when in use, the cover is torn only from the pressure of an extraction fluid when extraction starts; and
  - a sheet of fabric sealed in the bottom of the dish to both the central part and the peripheral part of the bottom, for retaining the dry edible substance, when the sealed cartridge is opened during extraction.
2. The cartridge according to claim 1, wherein the cover is welded or crimped to the top edge.
3. The cartridge according to claim 1 or 2, wherein the dish is made from aluminium having a thickness of 20 to 100  $\mu\text{m}$ , a pure or multi-layer plastic, a cardboard/aluminium/plastic composite, or a cardboard/plastic composite.
4. The cartridge according to claim 1 or 2, wherein the cover is made from aluminum with a thickness of 15 to 60 microns and a multilayer material, said multilayer material comprising:
  - paper of 20 to 60  $\text{g}/\text{m}^2$ , plastic of a thickness of 20 to 60 microns, and aluminum with a thickness of 5 to 20 microns;
  - ethylene vinyl alcohol polymer (EVOH) or polyvinylidene chloride (PVDC) of a thickness of 5 to 30 microns and

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polypropylene (PP), polyethylene (PE), or polyamide (PA) plastic of 20 to 100 microns;

polyethylene terephthalate (PET) of a thickness of 5 to 30 microns and PP or PE plastic of 20 to 100 microns; or

PET that is metallized or equipped with a layer which forms an efficient barrier.

5. The cartridge of claim 4, wherein the layer that forms an efficient barrier is  $\text{SiO}_2$ .

6. The cartridge according to any one of claims 1 to 5, having a diameter of between 2.5 and 6 cm and a height of between 10 and 40 mm.

7. The cartridge according to any one of claims 1 to 6, wherein the fabric has a thickness of between 15 and 200 microns.

8. The cartridge according to any one of claims 1 to 7, wherein the dry edible substance is ground roasted coffee, tea, instant coffee, a mixture of ground coffee and instant coffee, a chocolate-based product, or a mixture thereof.

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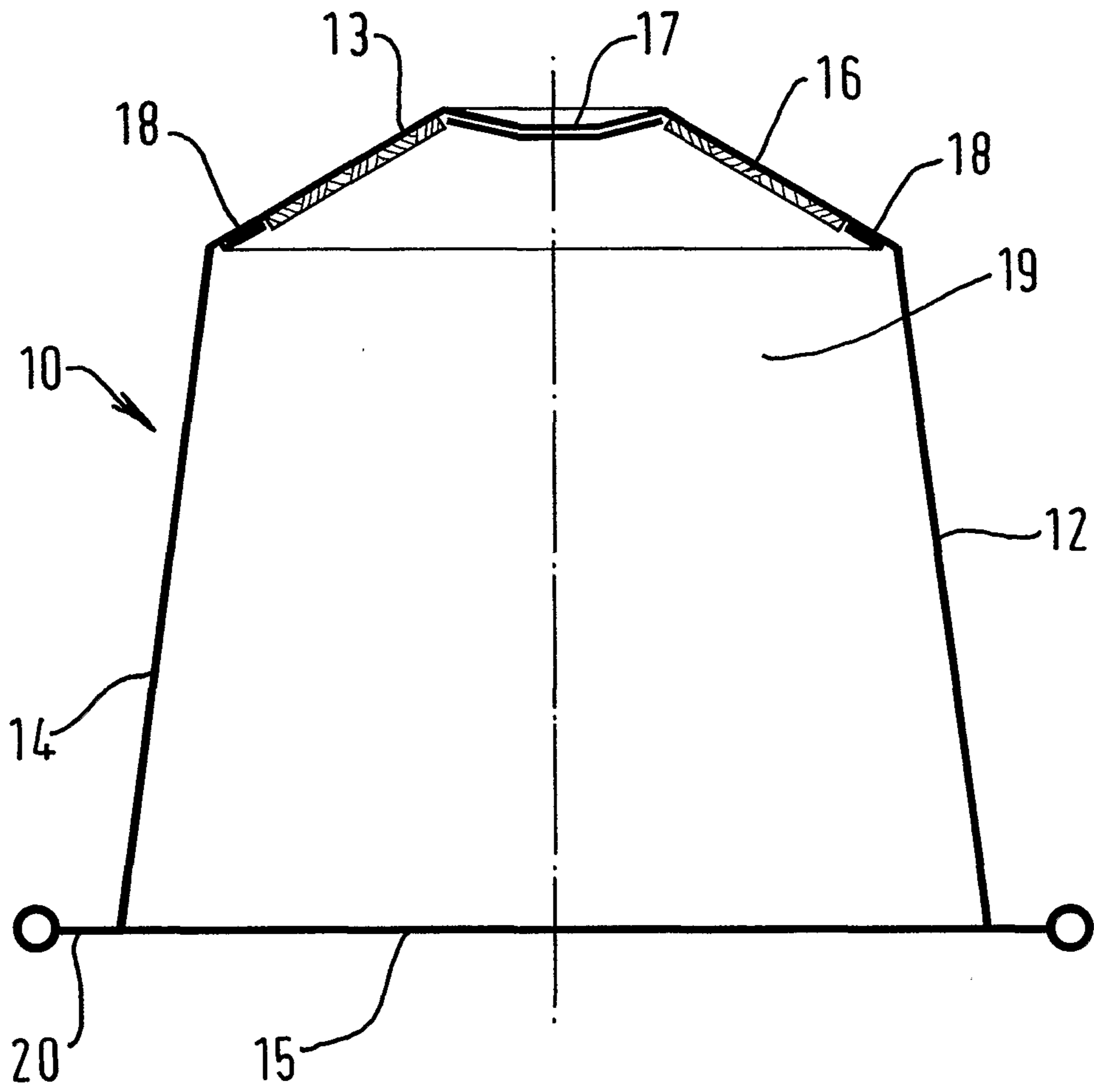


FIG. 1.

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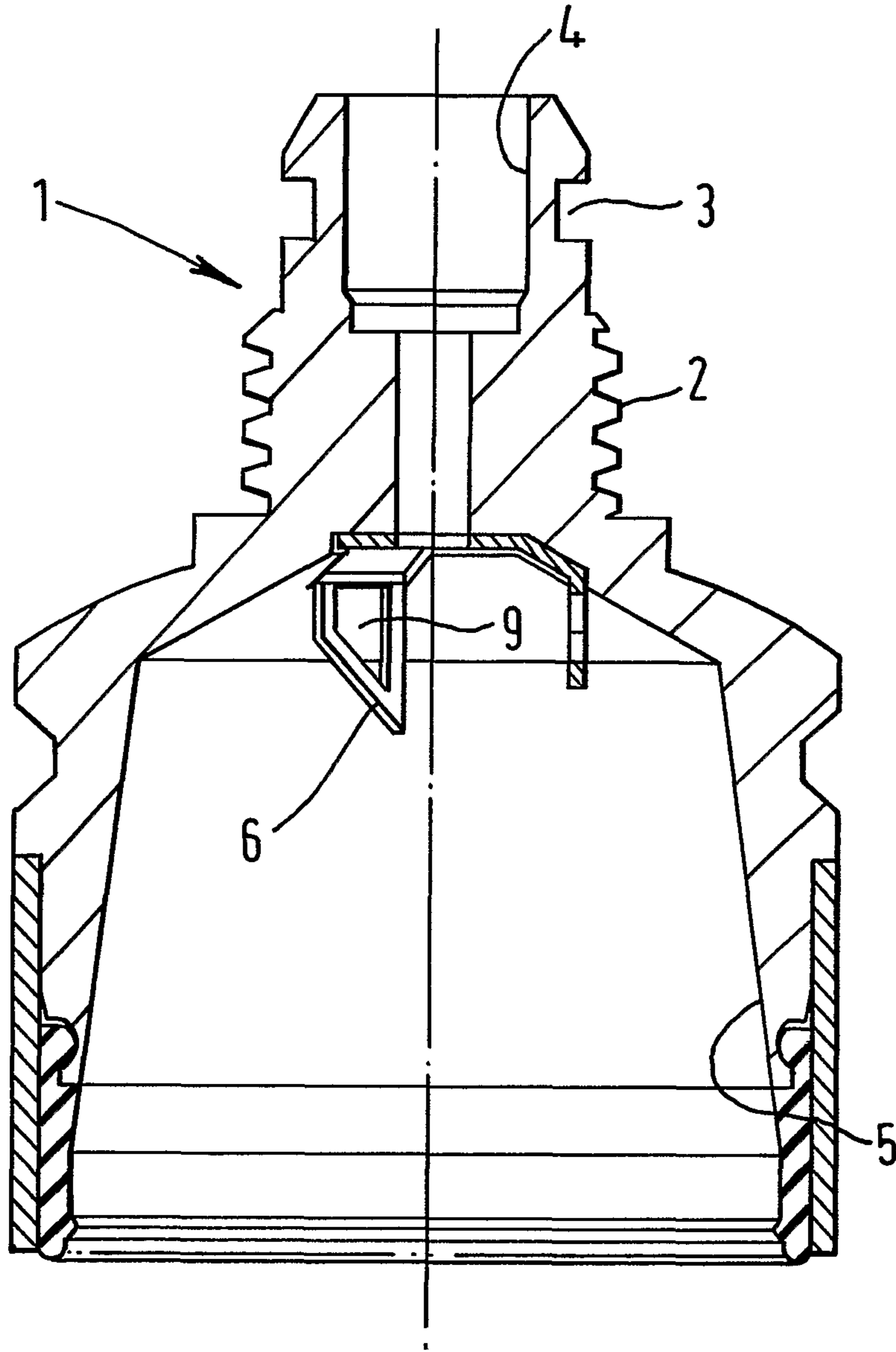


FIG. 2.

