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Remarks:

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(54) **Cartridge for powdered coffee or the like, suitable for being used in apparatus for making beverages as coffee or the like and method for making said cartridge**

(57) A cartridge (10) for powdered coffee or the like, suitable to be used in apparatus for making beverages such as coffee or the like, comprises an inner receptacle (12) defining a housing cavity (14) for the powdered coffee (16) and an outer receptacle (18) defining a housing cavity (20) for the inner receptacle (12). The inner receptacle (12) is closed and manufactured in a water- and oxygen-permeable material. The outer receptacle (18) is water- and oxygen-impermeable and is a containment and reinforcement element for the inner receptacle (12). The inner receptacle (12) comprises a first sheet (22) shaped such as to provide a bottom (24), side walls (26) and an edge (28).

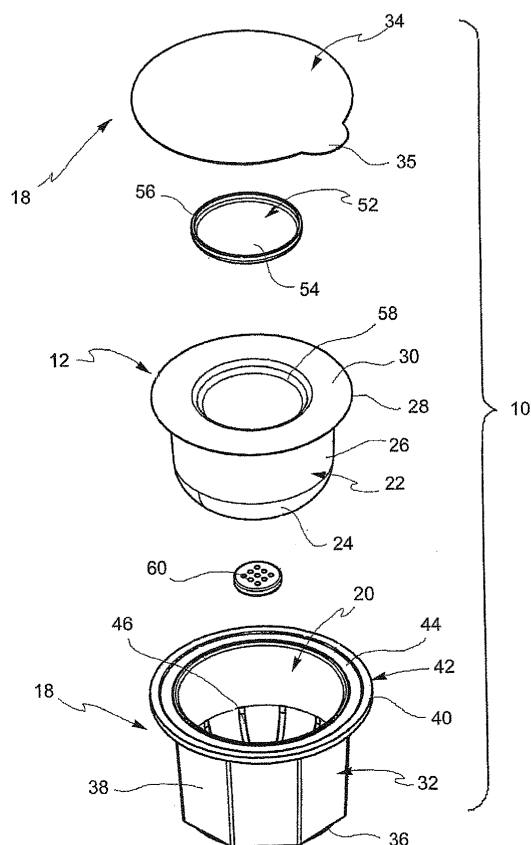


FIG. 1

Description

[0001] . The object of the present invention is a cartridge for powdered coffee or the like, suitable to be used in apparatus for making beverages such as coffee or the like and a method for making said cartridge.

[0002] . A number of cartridges is known which can be used in apparatus for making beverages such as coffee or the like, both of the automatic and manual loading type.

[0003] . In fact, the use of cartridges allows speeding up and simplifying the preparation of a beverage, also improving the cleaning conditions of the same apparatus. Furthermore, a cartridges provides a single-dose portion whose freshness and fragrance have, however, to be ensured either by a flexible outer wrapping, for example in aluminium, or by the cartridge being manufactured in an oxygen-impermeable material.

[0004] . The presence of the flexible wrapping is, however, highly limiting, since it requires the wrapping to be opened by hand before positioning the cartridge in the apparatus. Instead, the use of cartridges made of an oxygen-impermeable material which can be opened or pierced inside the apparatus, allows for the automatization of all steps, and accordingly also the use in fully automatic apparatus. While the need of providing a cartridge which allows an optimal recycle of the used materials and substances (coffee, plastic materials, etc. ...) fully compliant with the regulations in force in each single State is increasingly felt, however, it is still to be solved.

[0005] . The problem at the heart of the present invention is to provide a cartridge for powdered coffee or the like, adapted to be used in apparatus for making beverages such as coffee or the like, which has such structural and functional features as to meet the above-mentioned requirement, while overcoming the drawbacks cited with reference to the prior art.

[0006] . Such a problem is solved by means of a cartridge for powdered coffee or the like, suitable to be used in apparatus for making beverages such as coffee or the like in accordance with claim 1. Such a problem is further solved by means of a method to carry out a cartridge for powdered coffee or the like, suitable to be used in apparatus for making beverages such as coffee or the like in accordance with claim 41.

[0007] . Further characteristics and advantages of the cartridge according to the invention will be understood from the description given below of a preferred exemplary embodiment thereof, which is given as non-limiting indication, with reference to the attached figures, in which:

[0008] . Fig. 1 shows a schematic exploded view of a cartridge for powdered coffee or the like, adapted to be used in apparatus for making beverages such as coffee or the like according to the present invention;

[0009] . Fig. 2 shows the cartridge of Figure 1, in which some details have been better highlighted;

[0010] . Fig. 3 shows a perspective schematic view of the cartridge of Fig. 1 and 2, partially in section according to two radial planes incident to each other;

[0011] . Fig. 4 shows the cartridge of Fig. 3 in which some details have been better highlighted.

[0012] . With reference to the above-mentioned Figures, a cartridge for powdered coffee or the like has been generally designated with 10, which is suitable to be used in apparatus for making beverages such as coffee or the like.

[0013] . With reference to the description below, the terms "upper" and "lower" have been used with reference to the cartridge as oriented in the annexed Figures, independently from the arrangement actually taken during use.

[0014] . Advantageously, cartridge 10 comprises an inner receptacle 12 defining a housing cavity 14 for the powdered coffee 16. The cartridge 10 further comprises an outer receptacle 18 defining a housing cavity 20 of the inner receptacle 12.

[0015] . The inner receptacle 12 is closed and manufactured in a water- and oxygen-permeable material. Particularly, the inner receptacle is manufactured of a material selected from: paper, fabric, filter in plastic or metallic material.

[0016] . In accordance with a possible embodiment, the inner receptacle 12 comprises a first sheet 22 that is shaped such as to provide a bottom 24, side walls 26 and an edge 28 of the inner receptacle. Advantageously, the edge 28 of the inner receptacle 12 extends transversally outwardly of the side walls 26.

[0017] . Furthermore, the inner receptacle 12 comprises a second sheet 30 forming a substantially planar closure applied to the above-mentioned edge 28. The first and second sheets are welded or glued to each other along the edge 28 after the powdered coffee 16 has been inserted, and preferably pressed, within the housing cavity 14.

[0018] . Advantageously, the first sheet 22 and the second sheet 30 are made of the same material.

[0019] . The outer receptacle 18 is water- and oxygen-impermeable, both in configuration and materials, and is a holding and reinforcing member for the inner receptacle.

[0020] . In accordance with a possible embodiment, the outer receptacle 18 comprises a first member 32 and a second member 34. The first member 32 defines a bottom 36, side walls 38 and an edge 40 of the outer receptacle. The side walls and the bottom form the housing cavity 20 of the inner receptacle. The second member 34 defines a closure membrane applied to the edge 40 of the outer receptacle 18. Advantageously, the second member 34 comprises a tab 35.

[0021] . According to a possible embodiment, the housing cavity 20 defined by the outer receptacle 18 is counter-shaped relative to the inner receptacle 12 shape. Particularly, the housing cavity 20 defined by the outer receptacle 18 has such a cross and longitudinal size as to house the inner receptacle 12 with little clearance.

[0022] . Advantageously, the edge 28 of the inner receptacle 12 at least partially rests on the edge 40 of the

outer receptacle 18, thus being arranged between the edge 40 of the outer receptacle 18 and the closure membrane 34.

[0023] . In accordance with a possible embodiment, an annular welding portion 42 is provided between the closure membrane 34 and the edge 40 of the outer receptacle 18. Furthermore, the edge 28 of the inner receptacle 12 is provided to be at least partially rested on the edge 40 of the outer receptacle 18 at an inner portion relative to the annular welding portion 42. Particularly, it can be provided that the edge 40 of the outer receptacle 18 has an inner annular groove 44 relative to the annular welding portion 42 and suitable to accommodate at least one portion of the edge 28 of the inner receptacle 12.

[0024] . In other words, the edge 28 of the inner receptacle 12 at least partially rests on the edge 40 of the outer receptacle 18 at a portion in which the closure membrane 34 and the edge 40 of the outer receptacle 18 are not joined to each other, for example welded or glued to each other. Advantageously, the edge 40 of the outer receptacle 18 can have the annular groove 44 being suitable to receive at least one portion of the edge 28 of the inner receptacle 12.

[0025] . In accordance with a possible embodiment, the outer receptacle 18 comprises at least one portion having a higher rigidity than the inner receptacle 12. Advantageously, at least the first member 32 of the outer receptacle 18 defines the portion having a higher rigidity than the inner receptacle 12.

[0026] . In accordance with a possible embodiment, the first member 32 of the outer receptacle 18 is manufactured by injection or moulding of oxygen-impermeable plastic material. The second member 34 is manufactured for example by an aluminium sheet, or a composite sheet consisting of aluminium and plastics layers, or other oxygen-impermeable material.

[0027] . According to a possible embodiment, the first member 32 comprises longitudinal grooves 46 arranged therein along at least one portion of the side walls 38 and the bottom 36 of the first member 32.

[0028] . In accordance with a possible embodiment, the side walls 38 of the first member 32 extend below the respective bottom 36 of the first member, thus forming a lower peripheral wall 47.

[0029] . According to a possible embodiment, the bottom 36 of the outer receptacle 18 comprises a recess 48, for example centrally located relative to the cartridge. Advantageously, the recess 48 obtained in the bottom 36 of the outer receptacle 18 has ribs 50 extending inwardly of the outer receptacle 18.

[0030] . In accordance with a possible embodiment, an upper protecting member 52 can be provided, inserted between the inner receptacle 12 and the closure membrane 34 of the outer receptacle 18. The upper protecting member 52 is suitable to maintain a certain distance between the closure membrane 34 of the outer receptacle 18 and an upper surface of the inner receptacle 12. Particularly, the upper protecting member 52 is manufac-

ured by means of a planar perforated disk 54 suitable to be rested onto the upper surface of the inner receptacle 12 and delimited by an edge 56 extending to the closure membrane 34. Fig. 1 and 3 schematically illustrate the upper protecting member 52.

[0031] . Alternatively, the upper protecting member can be manufactured by means of a sheet or film capable of resisting the piercing, and protecting the inner receptacle.

[0032] . Generally, the upper protecting member 52 is water-permeable, for example as it is perforated or manufactured in a water-permeable material.

[0033] . Advantageously, the upper protecting member 52 is at least partially housed inside an impression 58 obtained in the upper surface of the inner receptacle 12.

[0034] . According to a possible embodiment, the upper protecting member 52 has lower cross size than the cross size of the outer receptacle 18. In this case, it is advantageously centrally located relative to the outer receptacle 18.

[0035] . In accordance with a possible embodiment, the cartridge 10 may further comprise a lower protecting member 60, inserted between the bottom 24 of the inner receptacle 12 and the bottom 36 of the outer receptacle 18. The lower protecting member 60 is adapted to maintain a certain distance between the bottom 24 of the inner receptacle 12 and the bottom 36 of the outer receptacle 18. Particularly, the lower protecting member 60 is manufactured by means of a perforated disk adapted to be rested onto the bottom 36 of the outer receptacle 18.

[0036] . Alternatively, the lower protecting member can be manufactured by means of a sheet or film capable of resisting the punching and protecting the inner receptacle.

[0037] . Generally the lower protecting member 60 is water-permeable for example as it is perforated or manufactured in a water-permeable material.

[0038] . In accordance with a possible embodiment, the lower protecting member 60 is accommodated at least partially within the recess 48 obtained in the bottom 36 of the outer receptacle 18, for example rested on the ribs 46, where provided.

[0039] . According to a possible embodiment, the lower protecting member 60 has a lower cross size than the cross size of the outer receptacle 18. In this case, it is advantageously centrally arranged relative to the outer receptacle 18.

[0040] . The mode of use of the above-described cartridge will be described below.

[0041] . The outer receptacle 18, by being oxygen-impermeable, ensures the fragrance and the preservation of the ingredient contained therein, particularly the powdered coffee. Upon use, the cartridge can be either manually or automatically introduced inside an infusion chamber of the apparatus for making the beverage.

[0042] . When the cartridge is in place within the infusion chamber, the closure membrane 34 and the bottom 36 of the outer receptacle are pierced, for example by

means of drill punches or opened otherwise, preferably at the protecting members, when provided. Advantageously, before the upper and lower drill punches (which can be optionally provided in a number greater than one) carry out the breaking of the closure membrane and the bottom, the cartridge is subjected to a pressing action exerted by a semi-elastic member, such as to create a sealing between a lowered plane of the edge 42 and the lower peripheral wall 47 of the outer receptacle 18. The semi-elastic member acts at a particularly resistant portion at the side wall of the outer receptacle.

[0043] . In accordance with a possible embodiment, the cartridge is first pierced at the bottom 36 and subsequently at the closure membrane 34, for example by means of respective drill punches. The punch piercing the closure membrane 34 consists of, for example, a nozzle through which hot pressurized water is supplied into the cartridge. The water flows through the inner receptacle, which is permeable thereto, and after it has soaked the layer of compacted powder, the beverage flows out through the opening provided in the bottom 36 of the outer receptacle 18.

[0044] . When protecting members are provided, the inner receptacle is pierced in the vicinity thereof, in order to avoid being damaged by the punch. When the upper protecting member is a sheet or film, as described above, this sheet has a greater resistance than the inner receptacle, such as to resist the piercing effect of the upper punch when it pierces the closure membrane 34. Particularly, the upper protecting member, which is preferably made of a permeable material, is flexed under the action of the upper punch without being pierced. The provision of an upper protecting member made in the form of a sheet or film allows avoiding the formation of a chamber, thus facilitating the manufacturing process.

[0045] . After the beverage delivery is completed, the infusion chamber is opened and the cartridge is ejected, either in an automatic or manual manner.

[0046] . The presence of a compacted layer of coffee, or generally the powdered element, ensures an optimum and even distribution of water, thus considerably improving the organoleptic characteristics of the beverage obtained.

[0047] . In addition, the effectiveness of water infusion is further improved by the edge 28 of the inner receptacle 12 being arranged between the edge 40 and the closure membrane 34 of the outer receptacle 18. This arrangement, in fact, forces the whole amount of water to flow through the inner receptacle 12 thereby avoiding the formation of by-pass between the outer receptacle 18 and the inner receptacle 12.

[0048] . When longitudinal grooves 46 are provided, this improves the flow of water/beverage to the bottom 36 of the outer receptacle 18.

[0049] . The provision of the upper and/or lower protecting members, though not strictly required, ensures the integrity of the inner receptacle 12.

[0050] . At the end of the preparation of the beverage,

the inner receptacle 12 can be separated from the outer receptacle 18 both in a manual and automatic manner. In fact, the arrangement of the edge 28 of the inner receptacle at an area not involved with welding/gluing between the edge 40 of the outer receptacle 18 and the closure membrane 34 maintains both receptacles structurally distinct from each other thus allowing the same to be separated after the closure membrane 34 has been removed, for example by means of the tab 35, when provided.

[0051] . The outer receptacle 18, and particularly the first member 32, due to the manufacturing mode, shape and size thereof, ensures support and reinforcement to the inner receptacle 12, both during the packaging and transportation steps, and during the beverage preparation cycle. Furthermore, by selecting an oxygen-impermeable material, the fragrance and preservation of the powdered ingredient can be ensured.

[0052] . The inner receptacle 12 is suitable to receive the powdered ingredient being advantageously pressed such as to ensure an optimum diffusion of the water there-through.

[0053] . The two receptacles follow different manufacturing processes that are suitable to meet the specific requirements for which they have been conceived. At the end of the manufacturing cycle, the two receptacles are assembled with the final closure of the outer receptacle.

[0054] . In this regard, the present invention further relates to a method for manufacturing a cartridge for powdered coffee or the like, which is suitable to be used in apparatus for making beverages such as coffee or the like, and described above.

[0055] . The aforesaid method comprises the steps of:

[0056] . manufacturing the closed inner receptacle 12 from a water- and oxygen-permeable material, which receptacle defines the housing cavity 14 for the powdered coffee 16, in which the coffee is pressed before closing the inner receptacle 12,

[0057] . inserting the inner receptacle 12 within the outer receptacle 18, being the containment and reinforcement element of the inner receptacle 12, before closing the outer receptacle 18 thereby making the latter impermeable to water and oxygen.

[0058] . It is particularly advantageous that the outer receptacle 18 is closed by means of the annular welding portion 42 between the closure membrane 34 and the edge 40 of the outer receptacle 18 and that the edge 28 of the inner receptacle 12 is at least partially rested on the edge 40 of the outer receptacle 18 in an inner portion relative to the welding annular portion 42.

[0059] . In other words, it is particularly advantageous that the edge 28 of the inner receptacle 12 is at least partially rested to the edge 40 of the outer receptacle 18 and that the closure membrane 34 is welded or glued to the edge 40 of the outer receptacle 18 without involving the edge 28 of the inner receptacle 12. Preferably, the edge 28 of the inner receptacle 18 only rests at the annular groove 44 of the edge 40. The remaining part of

the edge 40 is welded to the closure membrane 34, for example by means of the annular welding portion 42.

[0060] . From what has been stated above, it may be appreciated how providing a cartridge according to the present invention allows meeting the aforesaid requirement of recycling the various members composing the same in an independent manner, by separating the various materials.

[0061] . Furthermore, the cartridge according to the present invention is suitable to be used both in completely automated apparatus and in manually loaded apparatus.

[0062] . The provision of the outer receptacle ensures the fragrance and preservation of the powdered ingredient, performs a structural function of support and stiffening both during the packaging and transportation steps and when the beverage is being made.

[0063] . The provision of the inner receptacle facilitates both the production, in that it is made and closed independently of the outer receptacle, and the beverage preparation step, thereby defining an optimum water impregnation path and allowing pressing the powdered ingredient. Furthermore, it allows separate recycling as it is structurally independent of the outer receptacle and neither being glued/welded thereto, nor otherwise connected in a permanent manner.

[0064] . A further advantage of the cartridge according to the invention is the unusual structural simplicity of the latter, which allows the latter to be manufactured at a very low cost.

[0065] . It should be understood that variations and/or additions may be provided to what has been described and illustrated above.

[0066] . For example, the cartridge can be made such as to be pierced on the one side thereof and to be opened due to the inner pressure increase on the other side, thereby avoiding the provision of the corresponding drill punch. The side opening due to pressure can advantageously have weakening points in which the thickness of the material is reduced. In accordance with a possible embodiment, the closure membrane 34 is pierced by the upper drill punch which introduces pressurized hot water within the cartridge. Due to the pressure increase inside the cartridge, the bottom 36 is opened, for example, at the weakening points, when provided.

[0067] . To the preferred embodiment of the cartridge as described above, those skilled in the art, aiming at satisfying contingent and specific requirements, may carry out a number of modifications, adaptations and replacements of elements with functionally equivalent ones, without however departing from the scope of the claims below.

Claims

1. A cartridge (10) for powdered coffee or the like, suitable to be used in apparatus for making beverages such as coffee or the like, comprising:

an inner receptacle (12) defining a housing cavity (14) for the powdered coffee (16),
an outer receptacle (18) defining a housing cavity (20) of the inner receptacle (12),
wherein said inner receptacle (12) is closed and made of a water- and oxygen-permeable material,
and wherein said outer receptacle (18) is water- and oxygen-impermeable and is a containment and reinforcement element for said inner receptacle (12),
and wherein said inner receptacle (12) comprises a first sheet (22) shaped such as to provide a bottom (24), side walls (26) and an edge (28).

2. A cartridge according to claim 1, wherein the edge (28) of the inner receptacle (12) extends transversally outwardly of the side walls (26).
3. A cartridge according to claim 1 or 2, wherein the inner receptacle (12) comprises a second sheet (30) forming a substantially planar closure applied to the edge (28).
4. A cartridge according to claim 3, wherein the first sheet (22) and the second sheet (30) are welded or glued to each other along the edge (28).
5. A cartridge according to claim 3 or 4, wherein the first sheet (22) and the second sheet (30) are made of the same material.
6. A cartridge according to anyone of the preceding claims, wherein the inner receptacle (12) is manufactured of a material selected from: paper, fabric, filter in plastic or metallic material.
7. A cartridge according to anyone of the preceding claims, wherein said outer receptacle (18) comprises a first member (32) and a second member (34), wherein said first member (32) defines a bottom (36), side walls (38) and an edge (40) of the outer receptacle (18), said side walls (38) and said bottom (36) forming said housing cavity (20) of the inner receptacle (12), and wherein said second member (34) defines a closure membrane applied to said edge (40) of the outer receptacle (18).
8. A cartridge according to claim 7, wherein the second member (34) comprises a tab (35).
9. A cartridge according to claim 7 or 8, wherein the edge (28) of the inner receptacle (12) at least partially rests on the edge (40) of the outer receptacle (18), thus being arranged between the edge (40) of the outer receptacle (18) and the second member (34).

10. A cartridge according to claim 9, comprising an annular welding portion (42) between the second member (34) and the edge (40) of said outer receptacle (18), wherein the edge (28) of the inner receptacle (12) at least partially rests onto the edge (40) of the outer receptacle (18) at an inner portion relative to the annular welding portion (42). 5
11. A cartridge according to claim 10, wherein the edge (40) of the outer receptacle (18) has an annular groove (44) therein relative to the annular welding portion (42) and suitable to receive at least one portion of the edge (28) of the inner receptacle (12). 10
12. A cartridge according to anyone of the preceding claims, wherein said outer receptacle (18) comprises at least one portion having a greater rigidity than the inner receptacle (12). 15
13. A cartridge according to claim 12, wherein at least the first member (32) of the outer receptacle (18) is of higher rigidity than the inner receptacle (12). 20

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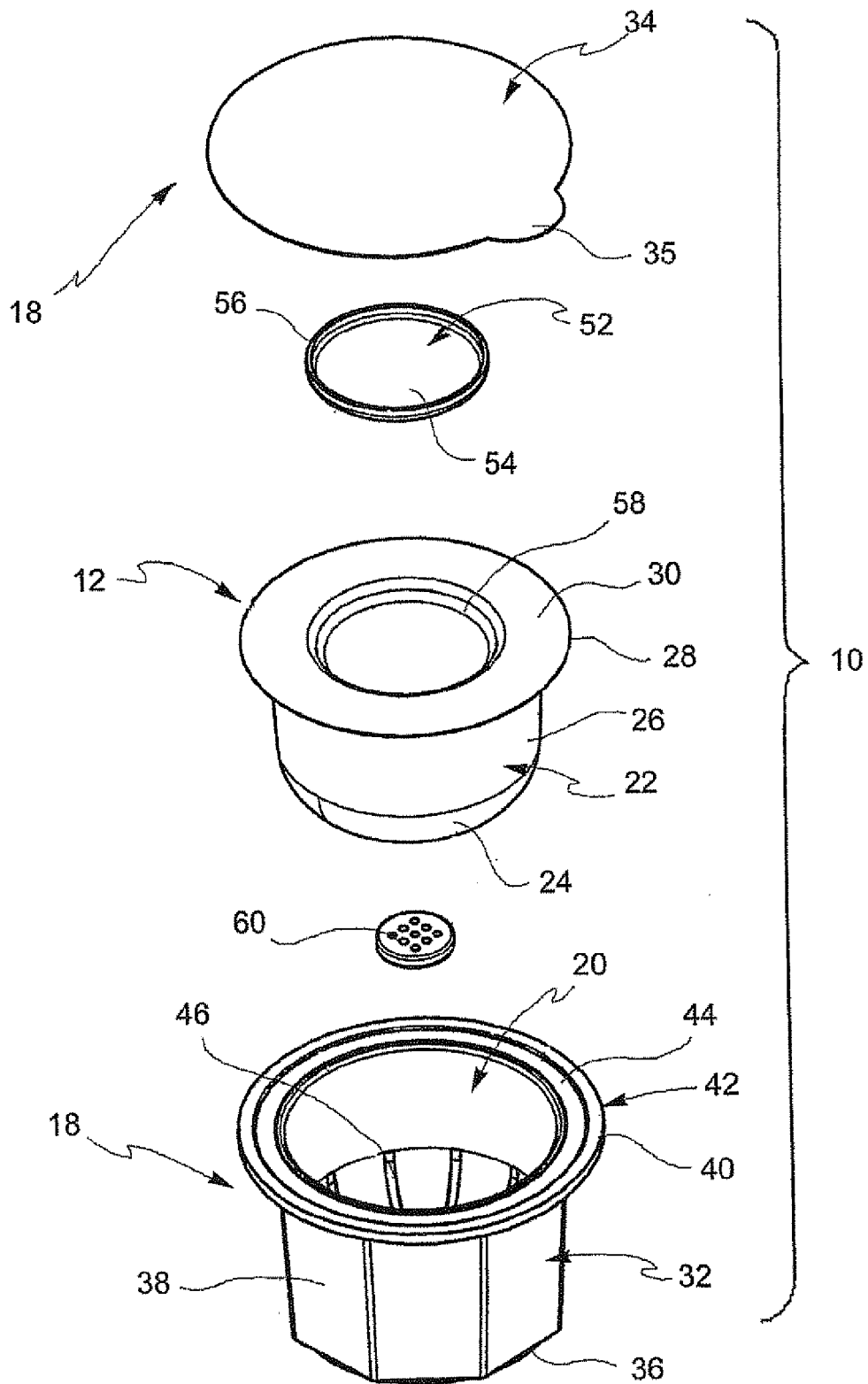


FIG. 1

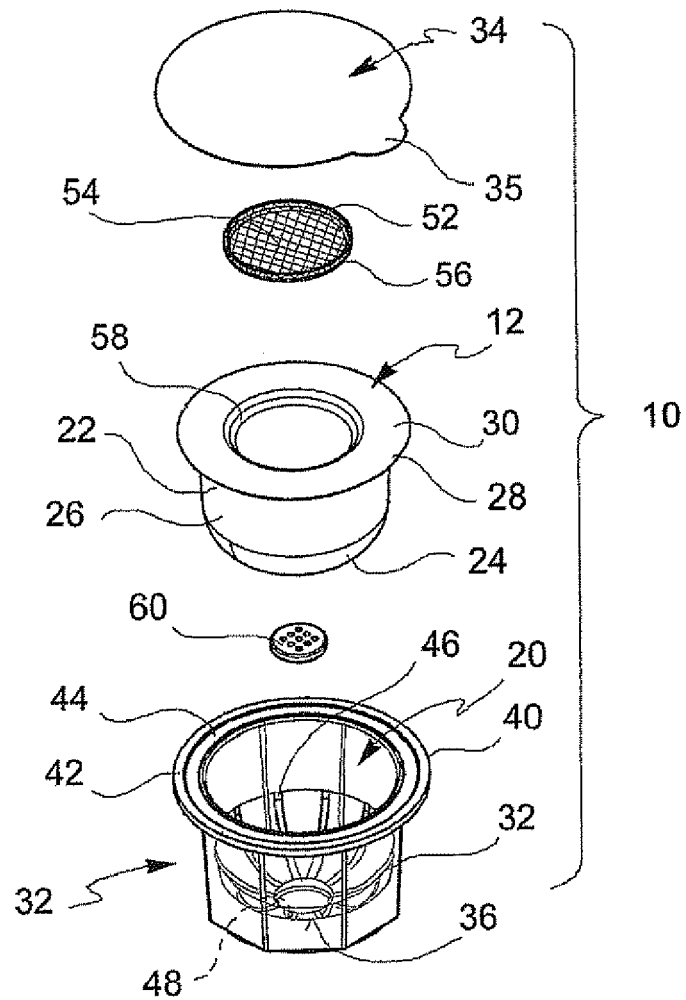


FIG. 2

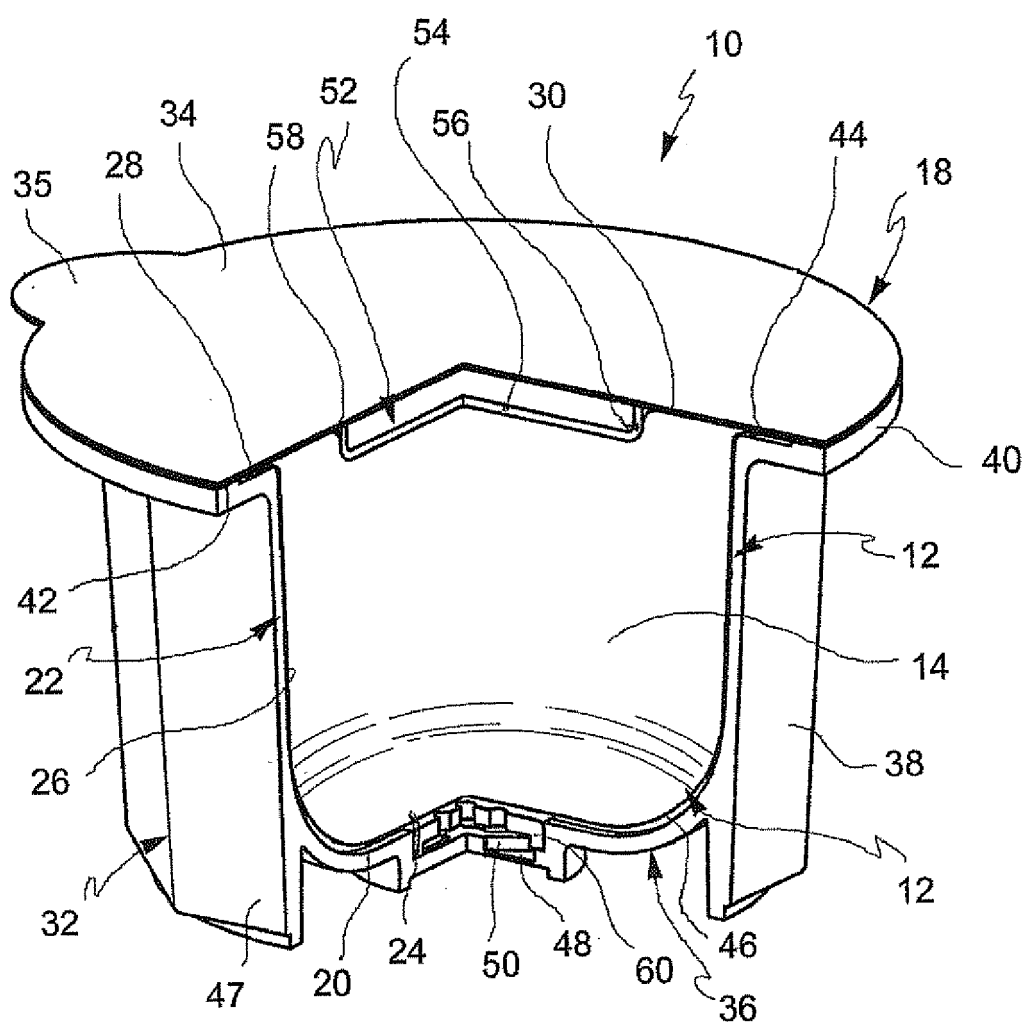


FIG. 3

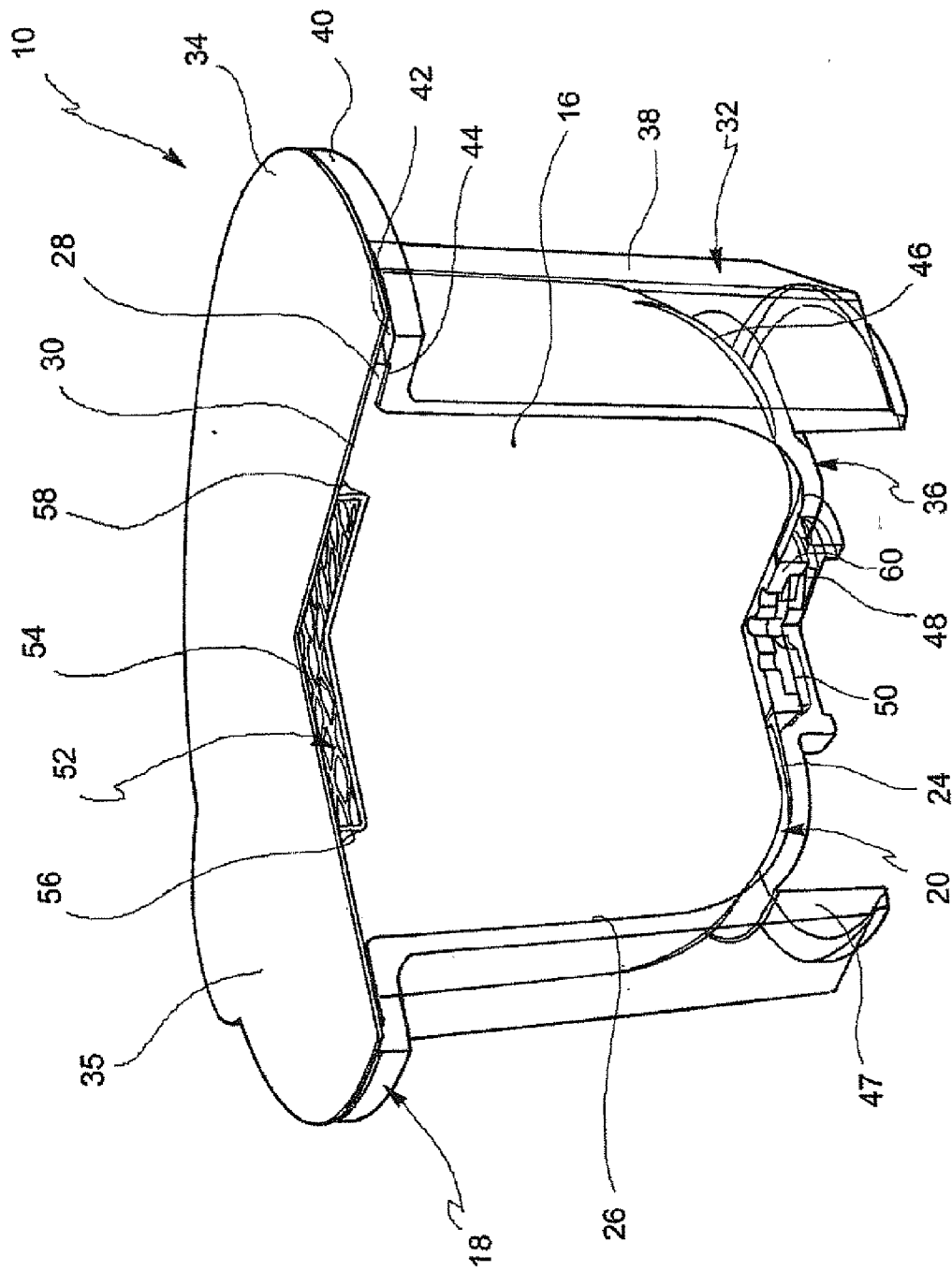


FIG. 4



EUROPEAN SEARCH REPORT

Application Number
EP 15 15 9642

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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