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(54) CONTAINER FOR FOODSTUFFS AND METHOD FOR MAKING SAID CONTAINER

(57) A container (10) is described comprising:
- a side wall (20), made of paper material, closed onto itself in the shape of a ring to laterally delimit an internal volume (15), said side wall (20) having an external surface (25) and an opposite internal surface (30), said internal surface (30) having a joining portion (U) superimposed on the external surface (25),
- a bottom (45) made of paper material, provided with a bottom wall (55) adapted to close one end of said internal volume (15) and with a perimeter edge (60) fixed to the side wall (20),
wherein the internal surface (30) of the side wall (20) and the bottom wall (55) of the bottom (45) are coated with a layer (S1) of inorganic material and wherein the joining portion (U) of the side wall (20) and the perimeter edge (60) of the bottom (45) are coated with a layer (S2) of polymeric material.

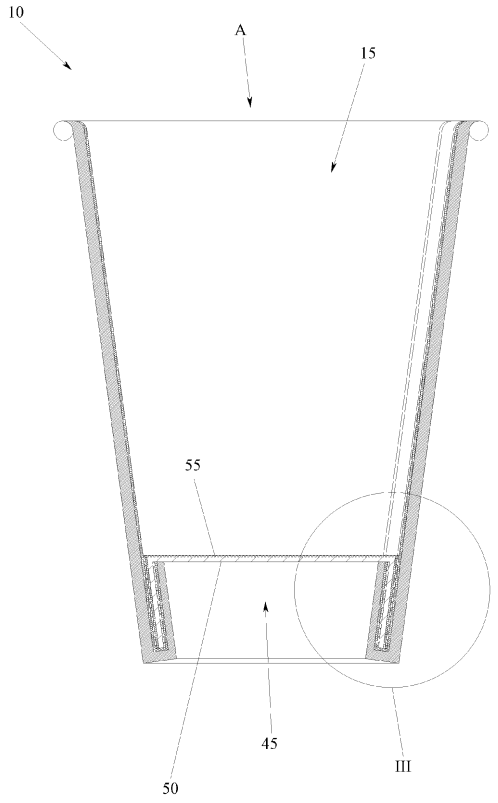

FIG.2

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Description

TECHNICAL FIELD

[0001] The present invention relates to the field of paper containers for foodstuffs.

[0002] In particular, the present invention relates to a container made of paper material suitable for containing both foodstuffs in the solid state and foodstuffs in the liquid and/or semi-liquid state.

PRIOR ART

[0003] In the food industry, containers for foodstuffs in the liquid and/or semi-liquid and/or semi-solid and/or solid state made from blanks of paper material are currently known and widely used.

[0004] In particular, for foodstuffs in the liquid and/or semi-liquid state such as for example beverages and/or yoghurt and/or mousses and the like, containers made of paper material substantially shaped like a cup so as to define an internal volume for the food type are known.

[0005] To ensure the correct preservation of foodstuffs and at the same time the integrity of the container, the internal volume is generally coated with a barrier layer that makes the receptacle resistant to liquids and fats and seals the cavity itself in order to avoid infiltration of air or oxygen.

[0006] A known drawback in the field is that this barrier layer is currently made of polymeric material, which makes sorting the materials difficult once the foodstuff is used up and makes the use of paper material in itself ineffective.

[0007] Furthermore, the European SUP (Single Use Plastic) directive has imposed severe numerical limitations on the use of such plastic-coated containers.

[0008] An object of the present invention is to solve said drawback of the prior art and to make available an alternative to containers provided with polymeric coating of the prior art, within a simple, rational and low cost solution.

[0009] Such object is achieved by the features of the invention indicated in the independent claim. The dependent claims outline preferred and/or particularly advantageous aspects of the invention.

DISCLOSURE OF THE INVENTION

[0010] The invention, particularly, makes available a container comprising:

- a side wall, made of paper material, closed onto itself in the shape of a ring to laterally delimit an internal volume, said side wall having an external surface and an opposite internal surface, said internal surface having a joining portion superimposed on the external surface,
- a bottom made of paper material, provided with a bottom wall adapted to close one end of said internal volume and with a perimeter edge fixed to the side wall,

wherein the internal surface of the side wall and the bottom wall of the bottom are coated with a layer of inorganic material and wherein the joining portion of the side wall and the perimeter edge of the bottom are coated with a layer of polymeric material.

[0011] Thanks to this solution, the invention makes available a container suitable both for foodstuffs in the solid or semi-solid state and in the liquid or semi-liquid state in which the polymeric coating is used only for the coating of a limited and peripheral portion of the side wall so as to act as an adhesive at the joining portion, and moreover only of a perimeter edge of the bottom wall of the bottom so as to act as an adhesive between the same and the side wall.

[0012] The container thus obtained is also perfectly in line with the European SUP (Single Use Plastic) directive which does not provide restrictions for containers using the polymeric material only as an adhesive.

[0013] Thanks to this solution, the container is also recyclable.

[0014] In particular, the entire portion of the internal surface of the side wall facing onto the internal volume of the container is coated only by said inorganic material (i.e., without a layer S2 of polymeric material).

[0015] The joining portion of the internal surface can be coated by the layer S1 of inorganic material and is coated by said layer S2 of polymeric material which acts as an adhesive (possibly superimposed on the layer S1 of inorganic material).

[0016] In other words, only the joining portion of the internal surface of the side wall is coated by said layer of polymeric material or at most the joining portion only and only a lower edge distal from an access opening of the container placed in contact with the bottom outside the internal space of the container.

[0017] As to the bottom, the bottom wall is coated (only) by said layer of inorganic material (i.e. without a layer of polymeric material).

[0018] In addition as the bottom, only the perimeter edge is coated with said layer of polymeric material (possibly superimposed on the layer of inorganic material), or at most only said perimeter edge and a base wall of the bottom that is arranged externally to the internal compartment of the container.

[0019] Said base wall, in particular, can be coated (only) by said layer of polymeric material, or be without a layer of inorganic material.

[0020] In other words, an entire portion of the bottom facing the internal volume of the container is coated only by said layer of inorganic material (i.e. without a layer of polymeric material).

[0021] Otherwise, the parts of the bottom that are facing the internal surface of the side wall or the outside of the container may be coated with a layer of polymeric

material.

[0022] Another aspect of the invention provides that said paper material can be multilayer. Thanks to this solution, the paper material is configured to give adequate stiffness to the container and is also capable of thermally insulating the foodstuff contained therein in a particularly effective manner.

[0023] Another aspect of the invention provides that said polymeric material can be dispersed in an aqueous solution.

[0024] Thanks to this solution, the coating of the joining portion of the internal face is particularly easy as well as the adhesion between the internal face and the external face.

[0025] Still another aspect of the invention provides that the polymeric material may comprise at least one of a polyolefin resin, an acrylic resin, a polyurethane resin, a vinyl resin and a polyester resin, preferably a biodegradable and compostable polyester resin.

[0026] Thanks to this solution, the polymeric material has proven efficacy in use as an adhesive.

[0027] A further aspect of the invention provides that said inorganic material may comprise Silica and/or an Alkoxysilane and/or a Silicon-based compound and/or Kaolin and/or clay.

[0028] Thanks to this solution, the inorganic material that coats the internal face of the side wall is particularly suitable to act as a barrier to both liquids and fats and to oxygen infiltrations, thus allowing to preserve both the integrity of the container and the characteristics of the foodstuff inserted in it.

[0029] Preferably, this inorganic material comprises a gel obtained starting from an aqueous or hydroalcoholic solution to which silica dioxide SiO_2 (in colloidal form) or an Alkoxysilane is added.

[0030] Furthermore, this inorganic material preferably has a pH lower than 4.

[0031] Still, a further aspect of the invention provides that the side wall comprises a re-joining edge between the internal surface and the external surface and that said re-joining edge can be arranged inside the internal volume and coated by the layer of polymeric material.

[0032] Thanks to this solution, also the re-joining edge that is inserted inside the internal volume of the container is coated with polymeric material which acts at the same time as an adhesive between the re-joining edge and the internal surface of the side wall and as a barrier layer that protect the re-joining edge by making it from the foodstuff contained in the container so as to preserve the strength of the container and thus the shelf life of the foodstuff inside the container.

[0033] The invention further makes available a method for making a container comprising the steps of:

- having available a first blank made of paper material, said first blank having two opposite major faces, of which a first face and a second face, the first face being coated by a layer of inorganic material and at a first perimeter edge by a layer of polymeric material;
- having available a second blank made of paper material, the second blank having two opposite major faces of which a respective first face and a respective second face, the respective first face being coated by a layer of inorganic material and at least one between the first face and the second face being coated along a contour thereof by a layer of polymeric material;
- wrapping the first blank onto itself in the shape of a ring, so as to define a side wall which laterally delimits an internal volume, wherein the first face is turned and facing onto the internal volume to define an internal surface of the side wall, and said first perimeter edge coated by the layer of polymeric material is superimposed on the second face to define a joining portion of the side wall,
- heating the first blank closed in the shape of a ring,
- assembling the first blank and the second blank so that the second blank is inserted inside the ring defined by the first blank to define a bottom which closes the internal cavity below in order to define a template of the container, and so that the second blank is arranged with the respective first face facing onto the internal volume to define a bottom wall of the bottom, and with the contour of the second blank to define a perimeter edge of the bottom in contact with the internal surface of the side wall obtained from the first blank,
- heating the obtained template.

[0034] Thanks to this solution, the invention makes available a method for making a container, mainly made of paper material (preferably at least 95% made of paper material), in which the internal volume of the container is delimited by the layer of inorganic material which acts as a barrier allowing to maintain the integrity of the container and at the same time to preserve the foodstuff contained therein, and in which the polymeric material is used exclusively as an adhesive in a small portion of the container.

[0035] Another aspect of the invention provides that having available a first blank may envisage:

- having available a tape of paper material provided with two opposite major surfaces, of which a first major surface and a second major surface;
- depositing a layer of inorganic material on the first major surface;
- depositing a layer of polymeric material on the first major surface at a limited and predetermined area thereof (for example by using a matrix or cliche);
- scoring the tape of paper material so as to obtain the first blank and so that the layer of polymeric material is arranged along a first perimeter edge thereof.

[0036] Thanks to this solution, the invention makes

available a method which allows obtaining the first blank in a particularly rapid and repeatable manner for large production volumes starting from the tape whose first major surface is coated with inorganic material.

[0037] Still, another aspect of the invention provides for having available a first blank may envisage:

- having available a tape of paper material provided with two opposite major surfaces, of which a first major surface and a second major surface;
- scoring the tape of paper material so as to obtain the first blank;
- depositing a layer of inorganic material at a first face of the first blank;
- depositing a layer of polymeric material along a first perimeter edge of the first face of the first blank.

[0038] Thanks to this solution, the invention makes available a method for producing the first blank which is particularly suitable for limited productions, and which allows a particularly precise deposition of the layer of polymeric material starting from the first blank already defined.

[0039] A further aspect of the invention provides that the polymeric material can be deposited by means of flexographic or rotogravure techniques.

[0040] Thanks to this solution, the polymeric material is deposited by means of techniques which are particularly effective in making the layer of material adhere and in depositing it precisely only in specific predetermined areas.

[0041] Still, another aspect of the invention provides that having available a second blank may envisage:

- having available a tape of paper material provided with two opposite major surfaces, of which a first major surface and a second major surface;
- depositing a layer of inorganic material on the first major surface;
- depositing a continuous strip, closed in the shape of a ring, of layer of polymeric material on the first major surface or on the second major surface (for example by using a respective matrix or cliche);
- scoring the tape of paper material so as to obtain the second blank and so that the strip closed in the shape of a ring defines (i.e. is arranged at) the contour of one of the respective first face and the respective second face thereof.

[0042] Thanks to this solution, the invention makes available a method which allows obtaining the second blank in a particularly rapid and repeatable manner for large production volumes starting from the tape whose first major surface is coated with inorganic material. Another aspect of the invention provides that having available a second blank may envisage:

- having available a tape of paper material provided with two opposite major surfaces, of which a first major surface and a second major surface,
- scoring the tape of paper material so as to obtain the second blank,
- depositing a layer of inorganic material at the first face of the second blank;
- depositing a layer of polymeric material along the contour of one of the first face and the second face of the second blank.

[0043] Thanks to this solution, the invention makes available a method for producing the second blank which is particularly suitable for limited productions, and which allows a particularly precise deposition of the layer of polymeric material starting from the second blank already defined.

BRIEF DESCRIPTION OF THE DRAWINGS

[0044] Further characteristics and advantages of the invention will become clear from reading the following description provided by way of non-limiting example, with the aid of the figures illustrated in the accompanying tables.

Figure 1 is a side front view of an embodiment of a container according to the invention.

Figure 2 is a sectional view along trace II-II of Figure 1.

Figure 3 is an enlarged view of the portion III of Figure 2.

Figure 4 is a side front view of another embodiment of a container according to the invention.

Figure 5 is a sectional view along the line V-V of Figure 4.

Figure 6 is an enlarged view of the portion VI of Figure 5.

Figure 7 is a front top view of a first blank for the realization of the container of Figures 1 and 5.

Figure 8 is a front top view of the first blank of Figure 7 coated with a layer of inorganic material.

Figure 9 is a front top view of the first blank of Figure 8 coated with a layer of polymeric material.

Figure 10 is a front top view of a second blank for the realization of the container of Figure 1.

Figure 11 is a front top view of the second blank of Figure 10 coated with a layer of inorganic material.

Figure 12 is a top view of the second blank of Figure 11 coated with a layer of polymeric material.

Figure 13 is a front top view of a second blank for the realization of the container of Figure 4.

Figure 14 is a front top view of the second blank of Figure 10 coated with a layer of inorganic material.

Figure 15 is a front bottom view of the second blank of Figure 13 coated with a layer of polymeric material.

Figure 16 is a front bottom view of the blank of Figure 15 coated with a layer of polymeric material

DETAILED DESCRIPTION

[0045] With particular reference to these figures, (particularly Figures 1-6), the number 10 globally denotes a container 10 for foodstuffs, i.e., defining an internal volume 15 for receiving foodstuffs in the solid or semi-solid state and/or in the liquid or semi-liquid state. By way of non-limiting example, the container 10 can be adapted to contain beverages or mousse or jellies or yoghurt or the like.

[0046] The container 10, as will become clearer in the following, is mainly made up of paper material, for example a multilayer paper material.

[0047] Preferably, the container 10 is made of at least 95% of paper material.

[0048] Said paper material preferably has a thickness between 0.15 mm - 0.5 mm. Furthermore, said paper material with which the container 10 is made preferably has a weight between 170 gsm and 400 gsm.

[0049] The container 10 first of all comprises a side wall 20, made of said paper material, which is closed onto itself in the shape of a ring to laterally delimit the internal volume 15 of the container 10 and at one end (for example an upper end) an opening of access A to the internal volume 15.

[0050] The side wall 20 has an external surface 25, that is, turned towards the environment external to the container 10, and an opposite internal surface 30, that is, turned towards the internal volume 15.

[0051] The internal surface 30 has a joining portion U superimposed on the external surface 25 and joined thereto.

[0052] Said internal surface 30 of the side wall 20 is (preferably entirely) coated with a layer S1 of inorganic material, which acts as a barrier for liquids and fats and also prevents the transpiration of air and therefore oxygen which could ruin beforehand the foodstuff inserted inside the container 10.

[0053] Preferably, said inorganic material comprises at least one of Kaolin, clay, Silica, a Silicon-based compound and an Alkoxysilane, more preferably at least one of Silica and an Alkoxysilane..

[0054] For example, said inorganic material comprises a gel (sol-gel) obtained by adding colloidal Silica and/or an Alkoxysilane to an aqueous or hydroalcoholic solution.

[0055] The internal surface 30 of the side wall 20 is also coated, at the joining portion U, by a layer S2 of polymeric material which acts as an adhesive between the internal surface 30 and the external surface 25, possibly superimposed on the layer S1 of inorganic material.

[0056] Preferably said polymeric material comprises at least one of a polyolefin resin, an acrylic resin, a polyurethane resin, a vinyl resin and a polyester resin, preferably a biodegradable and compostable polyester resin.

[0057] Furthermore, said polymeric material is preferably dispersed in an aqueous solution.

[0058] The internal surface 30 is then coated (preferably entirely/completely) by said layer S1 of inorganic material so that the entire portion of the internal surface 30 of the side wall 20 facing onto the internal volume 15 of the container 10 is (uniquely) coated by said inorganic material (i.e. without a layer S2 of polymeric material) while the joining portion U thereof which is superimposed on the external surface 25 is coated by said layer S2 of polymeric material which acts as an adhesive (possibly superimposed on the S1 layer of inorganic material).

[0059] The internal surface 30 is, therefore, predominantly without a layer of polymeric material S2.

[0060] In particular, at least a percentage equal to 50% (i.e. at least half) of the extension of the internal surface 30 of the side wall 20 is without a layer of polymeric material S2. For example, it is also possible to provide that the internal surface 30 of the side wall 20 is further coated by a layer S2 of said polymeric material at a lower edge 35 distal from the access opening A.

[0061] The side wall 20 also has a re-joining edge 40 between the internal surface 30 and the external surface 25, which substantially defines the thickness of the side wall 20 and which is arranged inside the internal volume 15 of the container 10.

[0062] It is possible to provide that, especially if the container 10 is used for containing foodstuffs in the liquid state for a long period, said re-joining edge 40 can also be coated with a layer S2 of said polymeric material.

[0063] The container 10 then comprises a bottom 45 made of said paper material, which is associated with the side wall 20 so as to delimit the internal volume 15 at one end (for example the lower one).

[0064] In particular, the bottom 45 has a base wall 50, turned towards the environment external to the container 10, and an opposite bottom wall 55, and is fixed to the side wall 20 with the bottom wall 55 facing onto the internal volume 15 of the container 10 so as to delimit one end (for example the lower end) of said internal volume 15.

[0065] In more detail, the bottom 45 has a perimeter edge 60 fixed to the side wall 20 (i.e., to the internal surface 30 thereof), and the perimeter edge 60 is coated with a layer S2 of polymeric material, for example the same polymeric material with which the joining portion U of the internal surface 30 of the side wall 20 is coated, which acts as a bond between said perimeter edge 60 of the bottom 45 and the side wall 20 for the mutual fixing of the two.

[0066] In particular, as is visible in Figures 2, 3, 5 and 6, it is possible to provide that the perimeter edge 60 of the bottom 45 can be folded with respect to the bottom wall 55, in a direction away from the access opening A of the container 10 so as to adhere to the surface internal 30 of the side wall 20.

[0067] Furthermore, it is possible to provide that the side wall 20 can be folded so as to enclose said perimeter edge 60 of the bottom 45, externally to the internal volume 15, through said lower edge 35 of the internal surface 30 of the side wall 20 which is folded so that it is facing (in contact) onto the perimeter edge 60 at the base wall 50

of the bottom 45 and with the layer S2 of polymeric material coating said lower edge 35 of the internal surface 30 so to act as a bond.

[0068] In detail, as best visible in the enlargements of Figures 3 and 6, the side wall 20 can be folded substantially U-shaped, and defines a cavity for accommodating said perimeter edge 60 of the bottom 45.

[0069] With the side wall 20 folded to define said accommodating cavity, the lower edge 35 of the internal surface 30 is facing the perimeter edge 60 of the bottom 45.

[0070] In particular, the internal surface 30 of the side wall 20 at said lower edge 35 has a first section T1 and a second section T2 opposite and facing each other at a non-zero reciprocal distance, and a third section T3 for the connection between the first section T1 and the second section T2.

[0071] The perimeter edge 60 has two opposite surfaces of which a first surface F1 and a second surface F2, and a third surface F3 joining the first surface F1 and the second surface F2.

[0072] The perimeter edge 60 is inserted inside the accommodating cavity defined by the side wall 20, and arranged with the first surface F1 turned and facing the first section T1, the second surface F2 turned and facing the second section T2, and the third surface F3 turned and facing the third section T3.

[0073] The bottom wall 55 of the bottom 45 is (preferably entirely/completely) coated with a layer S1 of inorganic material which acts as a barrier for liquids and fats and at the same time prevents infiltration of air and therefore of oxygen, for example the same inorganic material with which the internal surface 30 of the side wall 20 is coated.

[0074] The bottom 45 can therefore have a bottom wall 55 preferably entirely coated by said layer S1 of inorganic material and moreover only the perimeter edge 60 coated by said layer S2 of polymeric material (possibly superimposed on the layer S1 of inorganic material).

[0075] The bottom wall 55 is without a layer S2 of polymeric material.

[0076] As to the bottom 45 only the perimeter edge 60 can be coated with said layer S2 of polymeric material or, at most, only the perimeter edge 60 and the base wall 50.

[0077] The perimeter edge 60, as mentioned above, is at least partially coated with a layer of polymeric material S2.

[0078] Furthermore, also the lower edge 35 of the internal surface 30 of the side wall 20, as mentioned above, can be (at least partially) coated with said layer S2 of polymeric material

[0079] For example, as can be seen from Figure 3 in which an embodiment of the container 10 is illustrated, it is possible to provide that, before the bottom 45 and the side wall 20 are assembled, only the first surface F1 of the perimeter edge 60 can be coated with said polymeric material and that, at the same time, only the second section T2 of the lower edge 35 of the internal surface can be coated with said layer of polymeric material S2. Once the bottom 45 has been assembled with the side wall 20, the layer of polymeric material S2 coating the first surface F1 of the perimeter edge 60 acts as a bond between the first surface F1 and the first section T1, and the layer S2 of polymeric material coating the second section T2 acts as a bond between the second surface F2 and the second section T2.

[0080] Alternatively, as can be seen from Figure 6 in which an alternative embodiment of the container 10 is illustrated, it is possible to provide that, before the bottom 45 and the side wall 20 are assembled, only the second surface F2 of the perimeter edge 60 can be coated with said layer of polymeric material S2 (and possibly also the base wall 50 of the bottom 45), and, at the same time, that the lower edge 35 of the internal surface 30 is entirely coated with said layer S2 of polymeric material, i.e. that both the first section T1 and the second section T2 and the third section T3 are coated with said layer S2 of polymeric material.

[0081] In this case, once the bottom 45 and the side wall 20 have been assembled, the layer of polymeric material S2 coating the first section T1 acts as a bond between the first section T1 and the first surface F1, the layer of polymeric material S2 coating the second surface F2 and the layer of polymeric material S2 coating the second section T2 act as a bond between the second surface F2 and the second section T2, the layer of polymeric material S2 coating the third section T3 acts as a bond between the third section T3 and the third surface F3.

[0082] Such an embodiment and such an alternative embodiment of the container 10 are substantially identical to each other and differ only in the position of the layer S2 of polymeric material at the lower edge 35 of the internal surface 30 and at the bottom 45.

[0083] The invention also makes available a method for making a container 10 as described above.

[0084] This method first of all provides for having available a first blank 65 (for example of a substantially rectangular or substantially trapezoidal shape) made of paper material, for example of the paper material described above, said first blank 65 having two opposite major faces, of which a first face 70 and a second face, in which the first face 70 is (preferably entirely) coated by a layer S1 of inorganic material and at a first perimeter edge 75, and possibly with a second perimeter edge 80 contiguous to the first perimeter edge 75, by a layer S2 of polymeric material.

[0085] The first face 70 can, therefore, be coated by said layer S2 of polymeric material only at said first perimeter edge 75, or at most, only at said first perimeter edge 75 and said second perimeter edge 80.

[0086] The first face 70 is, therefore, predominantly without a polymeric layer S2, i.e. at least half of the overall extension of the surface of the first face 70 is without said layer S2 of polymeric material.

[0087] In order to have available said first blank 65, the method can first of all provide for having available a tape of said paper material, in which the tape has two opposite major surfaces, of which a first major surface and a second major surface.

[0088] For example, said tape of paper material can be unwound or extracted from a reel thereof.

[0089] The method can subsequently provide for depositing on the first major surface a layer S1 of inorganic material, preferably said inorganic material comprises at least one of Kaolin, clay, Silica, a Silicon-based compound and an Alkoxysilane, for example said inorganic material comprising Silicon or an alkoxysilane (for example said sol-gel obtained starting from an aqueous or hydroalcoholic based solution to which silicon dioxide SiO_2 or an alkoxysilane is added).

[0090] The method then provides for depositing, preferably by flexographic or rotogravure technique, a layer S2 of polymeric material on the first major surface, in a predetermined and limited area of the first major surface, possibly overlapping it on the layer S1 of previously deposited inorganic material.

[0091] In particular, the method can provide for superimposing a matrix or cliché on the first major surface of the tape, and depositing said layer S2 of polymeric material through the matrix or cliche.

[0092] In this way, the polymeric layer is deposited only in a predetermined and limited area of the major surface of the tape.

[0093] For example, said polymeric material can comprise at least one of an acrylic resin, a polyolefin resin, a polyurethane resin, a vinyl resin and a polyester resin, preferably a biodegradable and compostable polyester resin.

[0094] The method then provides for scoring the tape of paper material coated with the layer S1 of inorganic material and with the layer S2 of polymeric material so as to obtain the first blank 65 of a desired predetermined shape, and so that the layer S2 of polymeric material is arranged on the first face 70 along a first perimeter edge 75, for example on the first face 70 along a first perimeter edge 75 and a second perimeter edge 80 that are contiguous.

[0095] Alternatively, in order to have available said first blank 65, the method can provide for having available a tape of said paper material having two opposite major surfaces, of which a first major surface and a second major surface.

[0096] For example, said tape of paper material can be unwound or extracted from a reel thereof.

[0097] The method can then provide for scoring the tape of paper material so as to obtain the first blank 65 of a desired predetermined shape.

[0098] Subsequently, the method can provide for depositing at the first face 70 of the first blank 65 a layer S1 of inorganic material, preferably said inorganic material comprises at least one of Kaolin, clay, Silica, a Silicon-based compound and an Alkoxysilane, for example said inorganic material comprising Silicon or an alkoxysilane (for example said sol-gel obtained starting from an aqueous or hydro-alcoholic based solution to which silicon dioxide SiO_2 or an alkoxysilane is added).

[0099] The method can subsequently provide for depositing, preferably by flexographic or rotogravure technique, a layer S2 of polymeric material, for example a layer S2 of polymeric material comprising at least one of a polyolefin resin, an acrylic resin, a polyurethane resin, a vinyl resin and a polyester resin (preferably a biodegradable and compostable polyester resin), along a first perimeter edge 75 of the first face 70 of the first blank 65, for example along a first perimeter edge 75 and a second perimeter edge 80 that are contiguous.

[0100] In particular, the method can provide for superimposing a matrix or cliché on the first face 70 of the first blank 65, and depositing said layer S2 of polymeric material through the matrix or cliche.

[0101] In this way, the polymeric layer is deposited only at the first perimeter edge 75, and possibly at the second perimeter edge 80, maintaining a main portion of the first face 70 without said layer S2 of polymeric material and coated only by said layer S1 of inorganic material.

[0102] Regardless of how the first blank 65 was made, the method can further provide for depositing, preferably by spray technique, a layer S2 of polymeric material, for example said polymeric material comprising at least one of an acrylic resin, a polyolefin resin, a polyurethane resin, a vinyl resin and a polyester resin (preferably a biodegradable and compostable polyester resin), at a junction edge, distal from the first perimeter edge 75, between the first face 70 and the second face which substantially defines a thickness of the first blank 65.

[0103] In order to coat said junction edge, in the case of mass production of the container 10, the method can provide for having available a plurality of first blanks 65, each of which has a first face 70 coated by a layer S1 of inorganic material and at a first perimeter edge 75, and optionally at a second perimeter edge 80 by a layer S2 of polymeric material.

[0104] The method can then provide for superimposing the first blanks 65 of the plurality one onto the other to create a stack and so as to be substantially perfectly aligned in plan with the respective junction edges overlapped and aligned (in plan) on/to each other. The method can therefore provide for depositing by means of a spray a layer of said polymeric material at the junction edges of the first stacked blanks 65.

[0105] The method further provides for having available a second blank 85 (for example of a substantially circular or polygonal shape, in any case of predetermined shape and dimensions and suitable for coupling with the first blank in the manner described below) made of the aforesaid paper material, wherein said second blank 85 has two opposite major faces of which a respective first face 90 and a respective second face 90B, and wherein the first face 90 is (preferably entirely) coated by a layer S1 of inorganic material, for example the inorganic ma-

terial described above.

[0106] The second face 90B is preferably (entirely) without a layer S1 of inorganic material.

[0107] At least one (preferably only one) between the first face 90 and the second face 90B is coated along a (entire) contour 95,95B thereof by a layer S2 of polymeric material, for example said polymeric material comprising at least one of an acrylic resin, a polyolefin resin, a polyurethane resin, a vinyl resin and a polyester resin (preferably a biodegradable and compostable polyester resin).

[0108] In particular, alternatively, only a contour 95 of the first face 90 of the second blank 85 is coated with a layer S2 of polymeric material, or at least (for example only) a contour 95b of the second face 95 of the second blank 85 is coated with a layer S2 of polymeric material.

[0109] In particular, the first face 90 can have said layer S2 of polymeric material only at said contour 95.

[0110] In order to have available said second blank 85, the method can first of all provide for having available a tape of said paper material, in which the tape has two opposite major surfaces, of which a first major surface and a second major surface.

[0111] For example, said tape of paper material can be unwound or extracted from a reel thereof.

[0112] The method can then provide for depositing on the first major surface of the tape a layer S1 of inorganic material, preferably said inorganic material comprises at least one of Kaolin, clay, Silica, a Silicon-based compound and an Alkoxysilane, for example said inorganic material comprising Silicon or an alkoxysilane (for example said sol-gel obtained starting from an aqueous or hydroalcoholic based solution to which silicon dioxide SiO_2 or an alkoxysilane is added), for example so as to coat the entire first major surface of the tape.

[0113] The method can then provide for depositing, preferably by flexographic or rotogravure technique, a continuous strip (of predetermined desired shape and dimension), closed in the shape of a ring, of layer S2 of polymeric material on the first major surface of the tape, superimposing it on the layer S1 of material inorganic deposited previously, or on the second major surface of the tape (superimposing it directly on the paper material).

[0114] In particular, the method can provide for superimposing a respective matrix or cliché on the first major surface of the tape or the second major surface of the tape, and depositing said layer S2 of polymeric material through the matrix or cliche.

[0115] In this way, the polymeric layer is deposited only in a predetermined and limited area of the major surface (the first major surface or the second major surface) of the tape.

[0116] Subsequently, the method can provide for scoring the tape of paper material so as to obtain the second blank 85 and so that the strip of polymeric material closed in the shape of a ring is arranged at the first face 90 along the entire contour 95, or (alternatively) at the second face 95 along the entire contour 95B.

[0117] Alternatively, in the event that the layer S2 of polymeric material is deposited at said second major surface, the method may provide for coating the entire second major surface of the tape with said layer S2 of polymeric material.

[0118] The method can, in this case, subsequently provide for scoring the tape of paper material so as to obtain the second blank 85 with the entire second face 95 (and therefore also the contour 95B) thereof coated with said layer S2 of polymeric material. Alternatively, in order to have available said second blank 85, the method can first of all provide for having available a tape of paper material, for example the paper material described above, wherein the tape has two opposite major surfaces, of which a first major surface and a second major surface.

[0119] For example, said tape of paper material can be unwound or extracted from a reel thereof.

[0120] The method can then provide for scoring the tape of paper material so as to obtain the second blank 85 of a desired predetermined shape.

[0121] Subsequently, the method can provide for depositing at the respective first face 90 of the second blank 85 a layer S1 of inorganic material, preferably said inorganic material comprises at least one of Kaolin, clay, Silica, a Silicon-based compound and an Alkoxysilane, for example said inorganic material comprising Silicon or an alkoxysilane (for example said sol-gel obtained starting from an aqueous or hydroalcoholic based solution to which silicon dioxide SiO_2 or an alkoxysilane is added), for example so as to coat the entire first face 90 of the second blank 85 with said layer S1 of inorganic material (as visible in Figures 11 and 14).

[0122] Subsequently, the method can provide for depositing, preferably by flexographic or rotogravure technique, a layer S2 of polymeric material along the entire contour 95 of the respective first face 90 or along the entire contour 95B of the respective second face 90B of the second blank 85, for example said polymeric material comprising at least one of an acrylic resin, a polyolefin resin a polyurethane resin, a vinyl resin and a polyester resin (preferably a biodegradable and compostable polyester resin).

[0123] In particular, in order to deposit said layer S2 of polymeric material along the entire contour 95 of the first face 90 of the second blank 85 (as visible in Figure 12), the method can provide for superimposing a respective matrix or cliché on the first face 90 of the second blank 85, and depositing said layer S2 of polymeric material through the matrix or cliche.

[0124] In this way, the polymeric layer is deposited only at the contour 95 of the respective first face 90 of the second blank 85 maintaining a main portion of the first face without said layer S2 of polymeric material and coated only by said layer S1 of inorganic material. Alternatively, in order to deposit said layer S2 of polymeric material along the entire contour 95B of the second face 90B of the second blank 85, the method may provide for

superimposing a respective matrix or cliché on the second face 90B of the second blank 85, and for depositing said layer S2 of polymeric material through the respective matrix or cliche.

[0125] Still, alternatively, in order to deposit said layer S2 of polymeric material along the entire contour 95B of the second face 90B of the second blank 85, the method can provide for coating the second face 90B entirely with said layer of polymeric material S2 (as visible in Figure 16).

[0126] Having obtained the first blank 65 and the second blank 85, the method provides for wrapping the first blank 65 onto itself in the shape of a ring, so as to define a side wall 20 which laterally delimits an internal volume 15.

[0127] In particular, the method provides for wrapping the first blank 65 onto itself in the shape of a ring with the first face 70 turned and facing onto the internal volume 15 to define an internal surface 30 of the side wall 20, said first perimeter edge 75 coated by the layer S2 of polymeric material superimposed on the second face to define a joining portion U of the side wall 20, said second perimeter edge 80 (possibly coated with polymeric material) to define a lower edge 35 of the side wall 20 and said junction edge between the first face 70 and the second face (possibly coated with polymeric material) arranged inside the internal volume 15 to define a re-joining edge 40 between the internal surface 30 and the external surface 25.

[0128] The method subsequently provides for heating the first blank 65 closed in the shape of a ring, so as to glue the first face 70 and the second face of the first blank 65 through the layer S2 of polymeric material in order to define said side wall 20 of the container 10.

[0129] The method therefore provides for assembling the first blank 65 and the second blank 85 to define a template of the container 10.

[0130] The method provides (in order to assemble the first blank and the second blank), again, for inserting the second blank 85 inside the ring defined by the first blank 65 so as to define a bottom 45 which closes the internal cavity at the bottom and makes said template of the container 10 available as a whole.

[0131] In particular, the method provides for inserting the second blank 85 inside the ring made with the first blank 65 arranged with the respective first face 90 facing onto the internal volume 15 to define a bottom wall 55 of the bottom 45, and with the contour 95,95B of the second blank 85 coated with polymeric material to define a perimeter edge 60 of the bottom 45 in contact with the internal surface 30 of the side wall 20 obtained from the first blank 65.

[0132] For example, the method can provide for folding said contour 95,95B of the second blank 85 coated with polymeric material so as to adhere to the first face 70 of the first blank 65, and also for folding the second perimeter edge 80 of the first blank 65 to enclose the contour of the second blank 85 at the respective second face 95 thereof.

[0133] In detail, in order to arrange said contour 95.95B coated with the layer S2 of polymeric material in contact with the internal surface 30 of the side wall 20, the method can provide (before inserting the second blank 85 inside the ring made by the first blank 65) for folding the second blank 85 to define a bottom 95 having a base wall 50, an opposite bottom wall 55, and a perimeter edge 60 folded with respect to the bottom wall 55 having a first surface F1 and an opposite surface F2 and a third surface F3 for the connection between the first surface F1 and the second surface F2, and with the contour 95,95B (coated with said layer S2 of polymeric material) to define (at least one surface of) said perimeter edge 60 (for example so that the layer S2 of polymeric material is arranged only at the first surface F1 in the case in which the contour 95 of the first face 90 of the second blank 85 has been coated with said layer S2 of polymeric material, or only at the second surface F2 in the case in which the contour 95b of the second face 95 of the second blank 85 has been coated with said layer S2 of polymeric material).

[0134] The method can therefore provide for inserting the second blank 85 (folded) so that said perimeter edge 60 is folded with respect to the bottom wall 55 in a direction away from an upper opening A defined by the ring made with the first blank 65, and arranged in contact with the first face 70 of the first blank 65.

[0135] The method can further provide (in order to arrange said contour 95,95B in contact with the internal surface 30 of the side wall 20) for folding the second perimeter edge 80 of the first blank 65 to enclose (with contact) the perimeter edge 60 of the bottom 45 defined by the second blank 85.

[0136] In particular, the method can provide for folding said second perimeter edge 80 of the first blank 65 to define a lower edge 35 of the (internal surface 30 of the) side wall 20 (defining a cavity for accommodating the perimeter edge 60 defined by the second folded blank 85) provided with a first section T1 (facing the first surface F1 of the perimeter edge 60 defined by the second blank 85), a second opposite section T2 (facing the second surface F2 of the perimeter edge 60) and a third section T3 for the connection between the first section T1 and the second section T2 (facing the third surface F3 of the perimeter edge 60), and with the layer S2 of polymeric material possibly deposited on the perimeter edge 80 arranged at only the second section T2 or arranged at the first section T1, of the second section T2 and of the third section T3.

[0137] The method therefore provides for heating the template obtained so as to make the second blank 85 adhere to the first blank 65 by means of the polymeric material on the perimeter edge 60 of the bottom 45 (and possibly of the lower edge 35 of the internal surface 30 defined by the second perimeter edge 80 of the first face 70 of the first blank 65) and to obtain the container 10.

[0138] The invention thus conceived is susceptible to several modifications and variations, all falling within the

scope of the inventive concept.

[0139] Moreover, all details can be replaced by other technically equivalent elements.

[0140] In practice, the materials used, as well as the contingent shapes and sizes, can be whatever according to the requirements without for this reason departing from the scope of protection of the following claims.

Claims

1. A container (10) comprising:

- a side wall (20), made of paper material, closed onto itself in the shape of a ring to laterally delimit an internal volume (15), said side wall (20) having an external surface (25) and an opposite internal surface (30), said internal surface (30) having a joining portion (U) superimposed on the external surface (25),
- a bottom (45) made of paper material, provided with a bottom wall (55) adapted to close one end of said internal volume (15) and with a perimeter edge (60) fixed to the side wall (20),

wherein the internal surface (30) of the side wall (20) and the bottom wall (55) of the bottom (45) are coated with a layer (S1) of inorganic material and wherein the joining portion (U) of the side wall (20) and the perimeter edge (60) of the bottom (45) are coated with a layer (S2) of polymeric material.

2. A container (10) according to claim 1, wherein said paper material is multilayer.

3. A container (10) according to any one of the preceding claims, wherein the polymeric material comprises at least one of a polyolefin resin, an acrylic resin, a polyurethane resin, a vinyl resin and a polyester resin.

4. A container (10) according to claim 1, wherein said inorganic material comprises Silica and/or an Alkoxysilane and/or a Silicon-based compound and/or Kaolin and/or clay.

5. A container (10) according to claim 1, wherein the side wall (20) comprises a re-joining edge (40) between the internal surface (30) and the external surface (25), said re-joining edge (40) being arranged inside the internal volume (15) and coated with a layer (S2) of polymeric material.

6. Method for making a container (10) comprising the steps of:

- having available a first blank (65) made of paper material, said first blank (65) having two opposite major faces, of which a first face (70) and a second face, the first face (70) being coated by a layer (S1) of inorganic material and at a first perimeter edge (75) by a layer (S2) of polymeric material;
- having available a second blank (85) made of paper material, the second blank (85) having two opposite major faces of which a respective first face (90) and a respective second face, (90B), the respective first face (90) being coated by a layer (S1) of inorganic material and at least one between the first face (90) and the second face (90B) being coated along a contour (95,95B) thereof by a layer (S2) of polymeric material;
- wrapping the first blank (65) onto itself in the shape of a ring, so as to define a side wall (20) which laterally delimits an internal volume (15), wherein the first face (70) is turned and facing onto the internal volume (15) to define an internal surface (30) of the side wall (20), and said first perimeter edge (75) coated by the layer (S2) of polymeric material is superimposed on the second face to define a joining portion (U) of the side wall (20);
- heating the first blank (65) closed in the shape of a ring;
- assembling the first blank (65) and the second blank (85) so that the second blank (85) is inserted inside the ring defined by the first blank (65) to define a bottom (45) which closes the internal volume (15) below in order to define a template of the container (10), and so that the second blank (85) is arranged with the respective first face (90) facing onto the internal volume (15) to define a bottom wall (55) of the bottom (45), and with the contour (95) of the second blank (85) defining a perimeter edge (60) of the bottom (45) in contact with the internal surface (30) of the side wall (20) obtained from the first blank (65),
- heating the obtained template.

7. The method according to claim 6, wherein having available a first blank (65) provides for:

- having available a tape of paper material provided with two opposite major surfaces, of which a first major surface and a second major surface;
- depositing a layer (S1) of inorganic material on the first major surface;
- depositing a layer (S2) of polymeric material on the first major surface at a limited and predetermined area thereof,
- scoring the tape of paper material so as to obtain the first blank (65) and so that the layer (S2) of polymeric material is arranged along a first perimeter edge (75) thereof.

8. The method according to claim 6, wherein having available a first blank (65) provides for:

- having available a tape of paper material provided with two opposite major surfaces, of which a first major surface and a second major surface,
- scoring the tape of paper material so as to obtain the first blank (65),
- depositing a layer (S1) of inorganic material at the first face (70) of the first blank (65);
- depositing a layer (S2) of polymeric material along a first perimeter edge (75) of the first face (70) of the first blank (65).

9. The method according to claim 7 or 8, wherein the polymeric material is deposited by flexographic or rotogravure technique.

10. The method according to claim 6, wherein having available a second blank (85) provides for:

- having available a tape of paper material provided with two opposite major surfaces, of which a first major surface and a second major surface;
- depositing a layer (S1) of inorganic material on the first major surface;
- depositing a continuous strip, closed in the shape of a ring, of layer (S2) of polymeric material on the first major surface or on the second major surface;
- scoring the tape of paper material so as to obtain the second blank (85) and so that the strip closed in the shape of a ring defines the contour (95,95B) of one of the respective first face (90) and the second face (95) thereof.

11. The method according to claim 6, wherein having available a second blank (85) provides for:

- having available a tape of paper material provided with two opposite major surfaces, of which a first major surface and a second major surface,
- scoring the tape of paper material so as to obtain the second blank (85),
- depositing a layer (S1) of inorganic material at the respective first face (90) of the second blank (85);
- depositing a layer (S2) of polymeric material along the contour (95,95B) of one of the respective first face (90) and the respective second face (95) of the second blank (85).

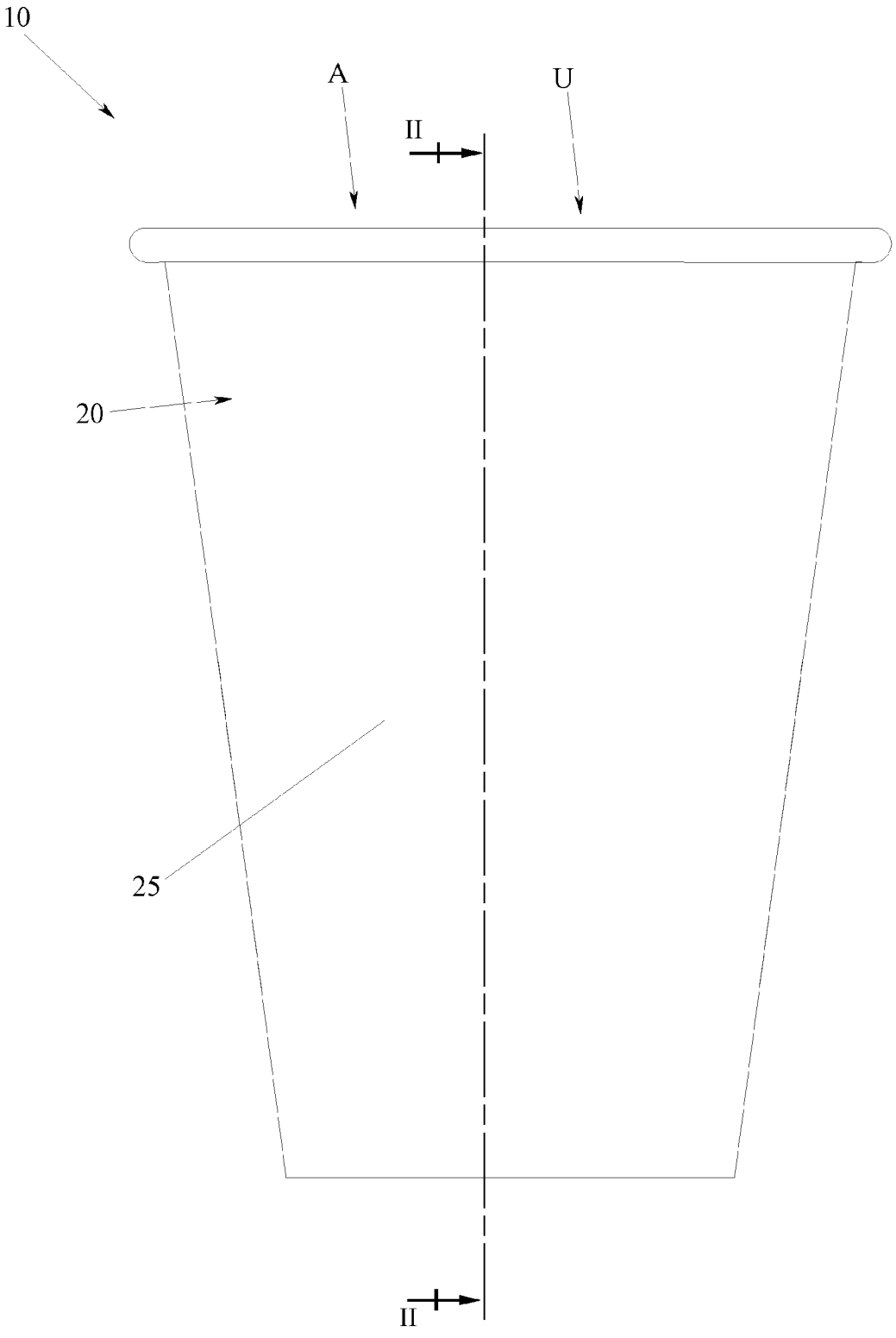

FIG.1

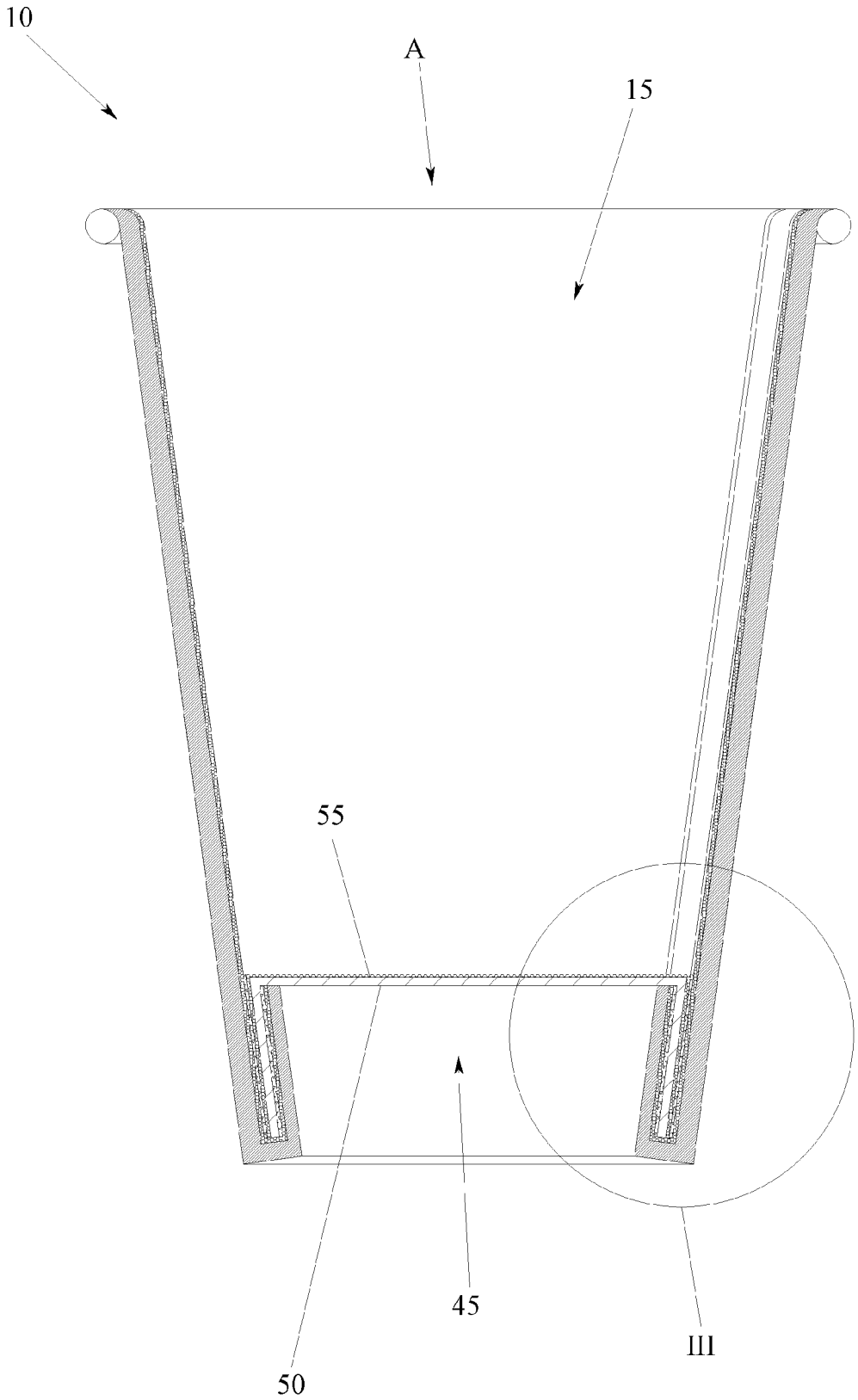

FIG.2

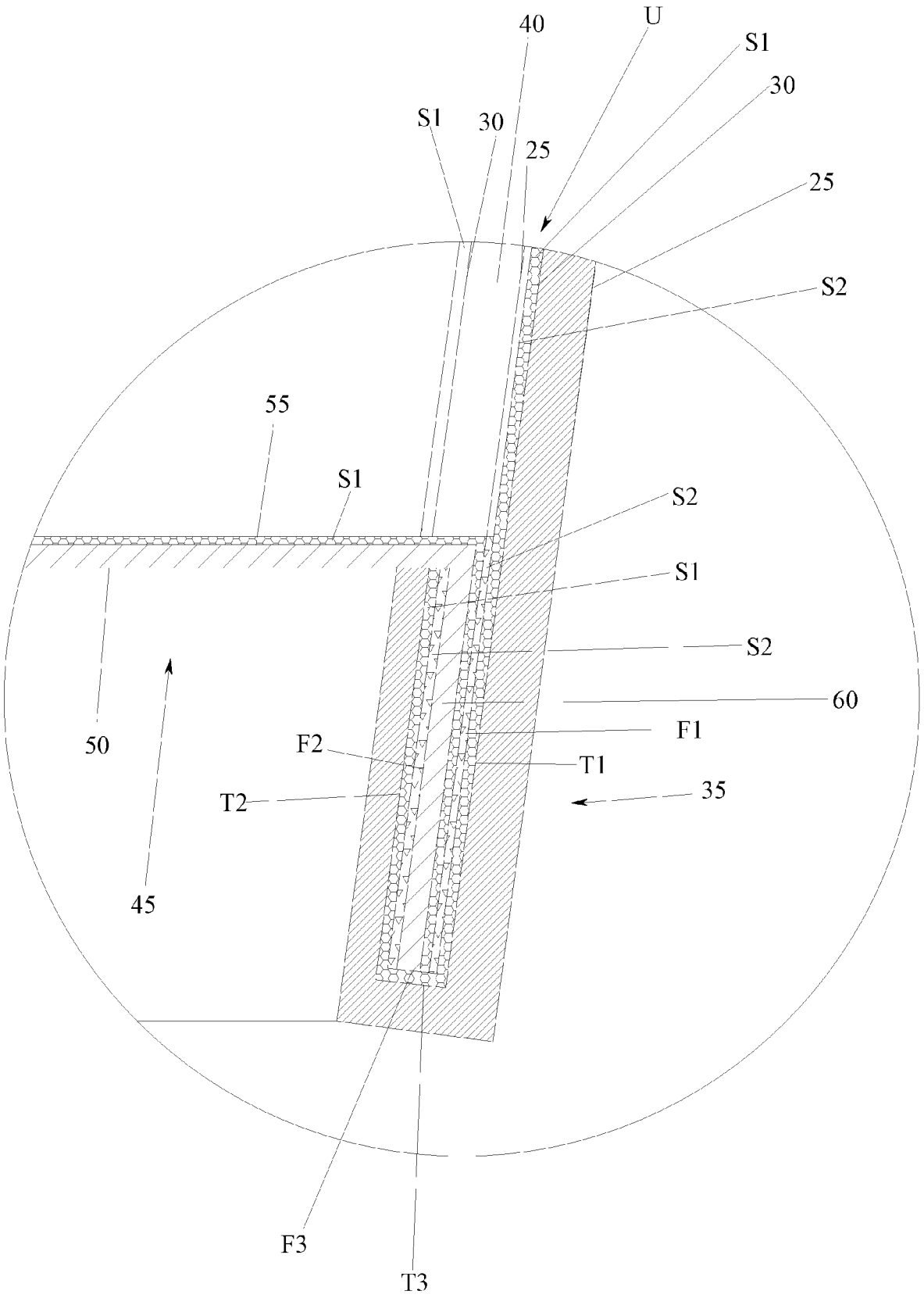

FIG.3

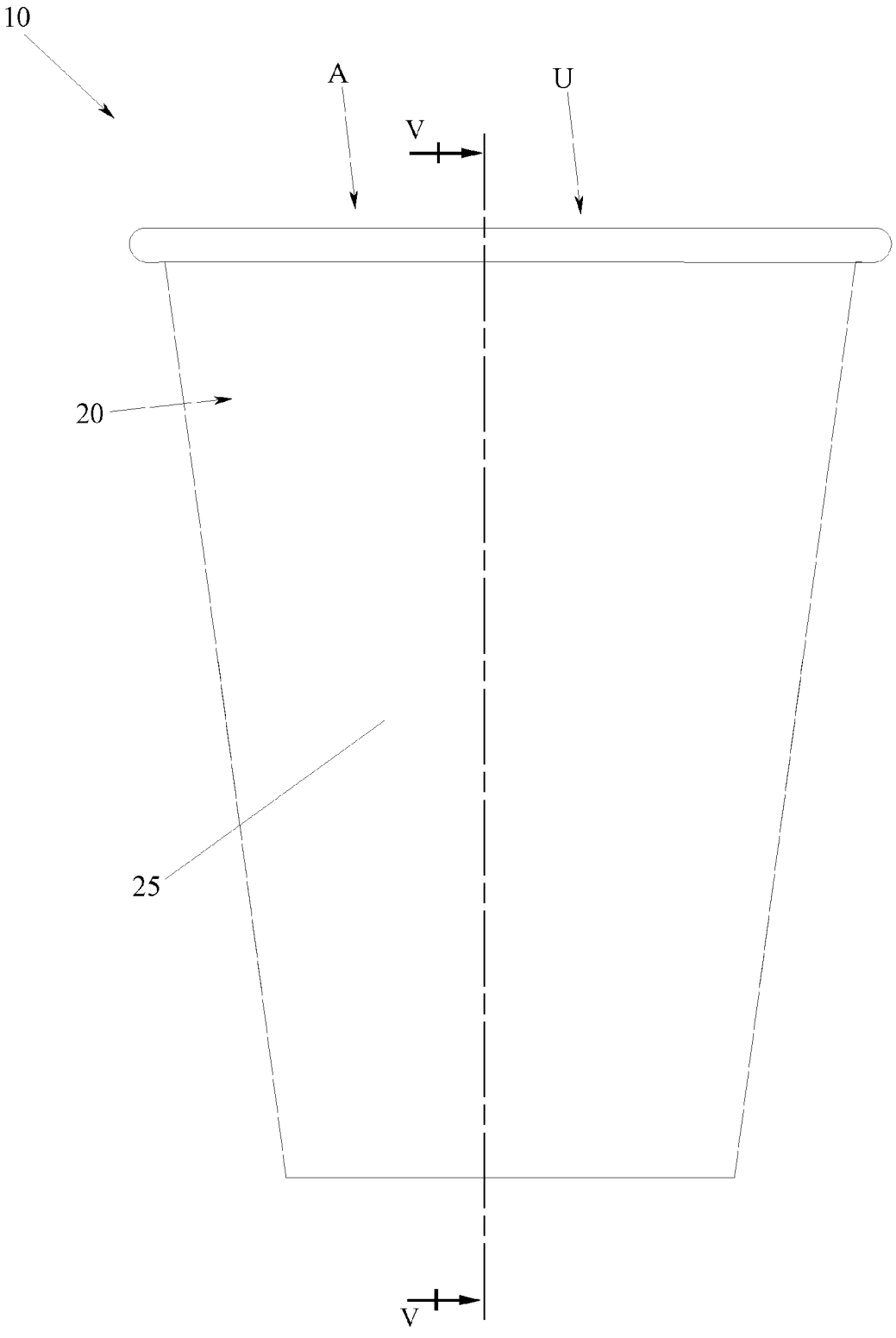

FIG.4

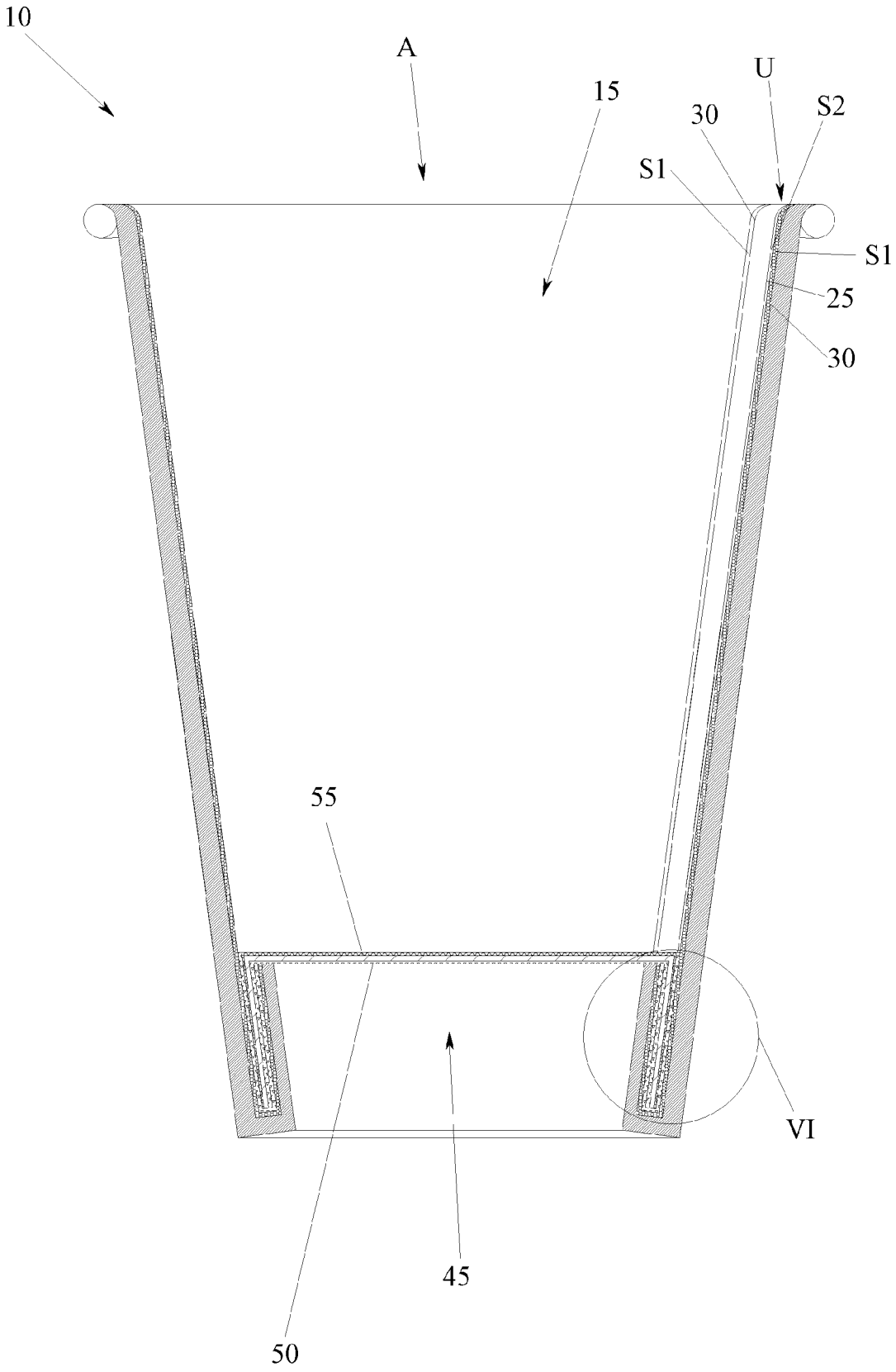

FIG.5

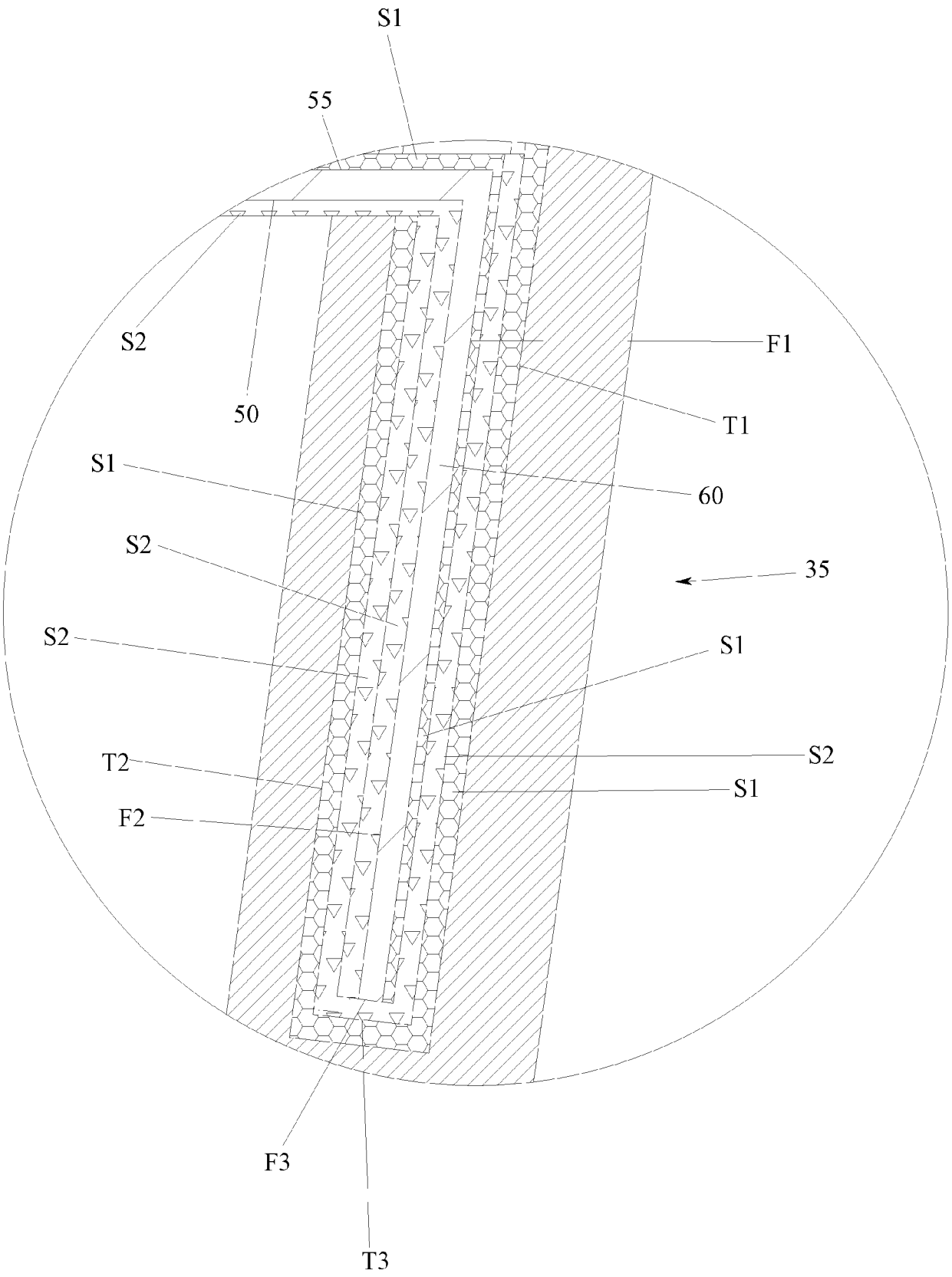

FIG.6

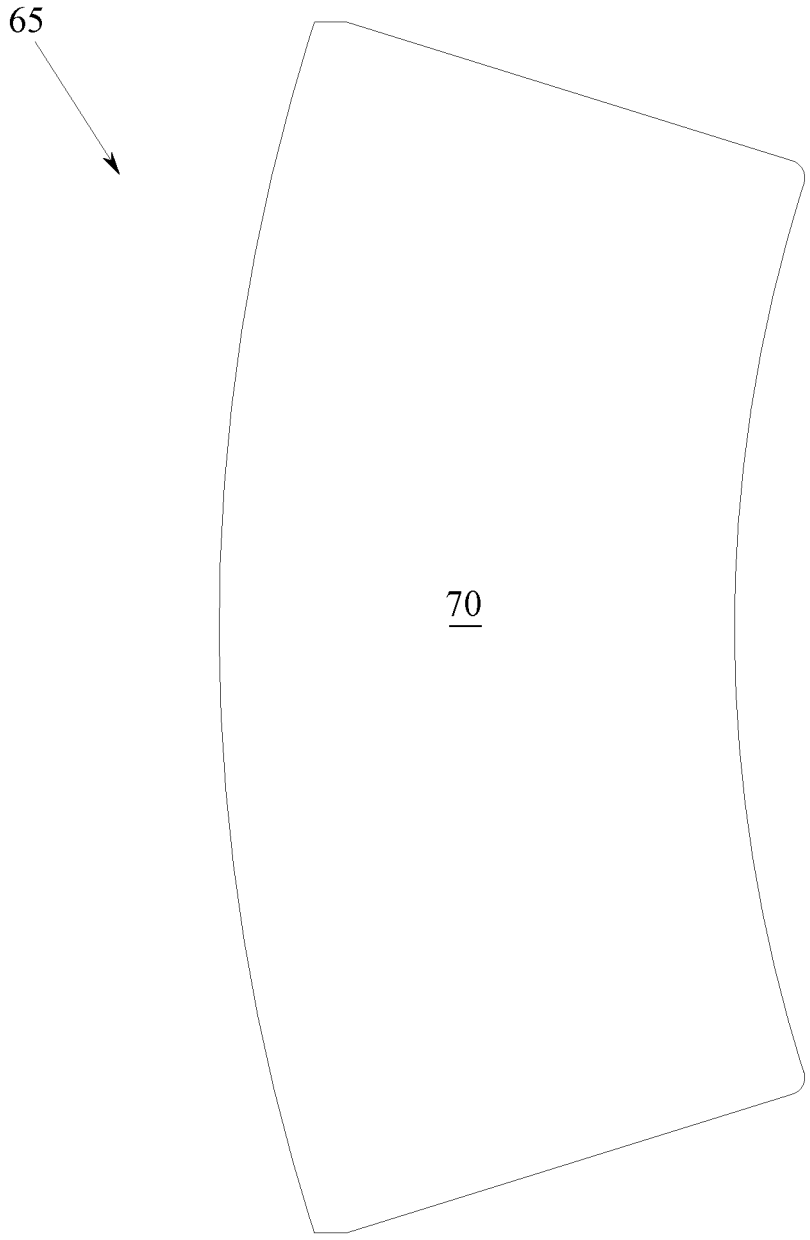

FIG.7

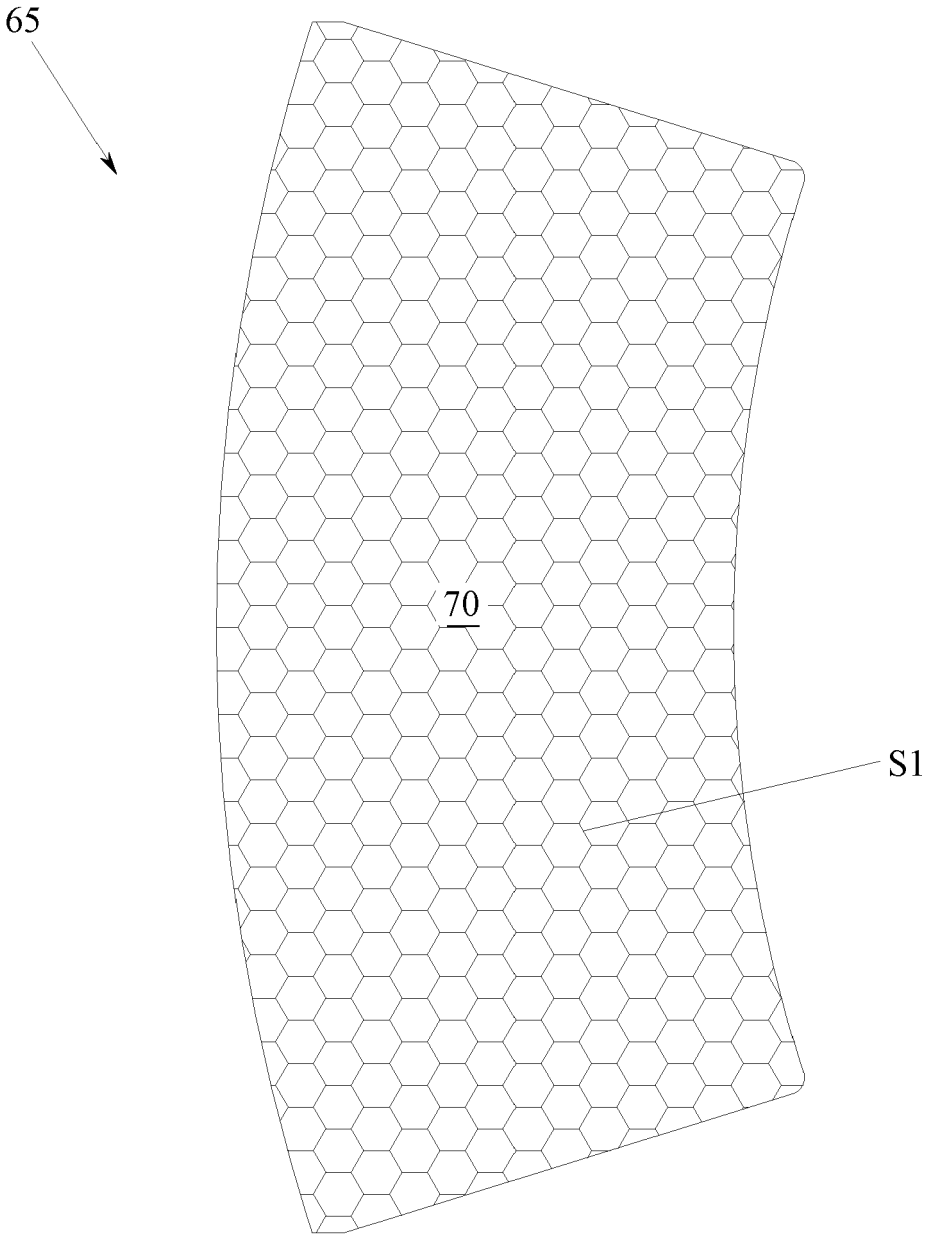

FIG.8

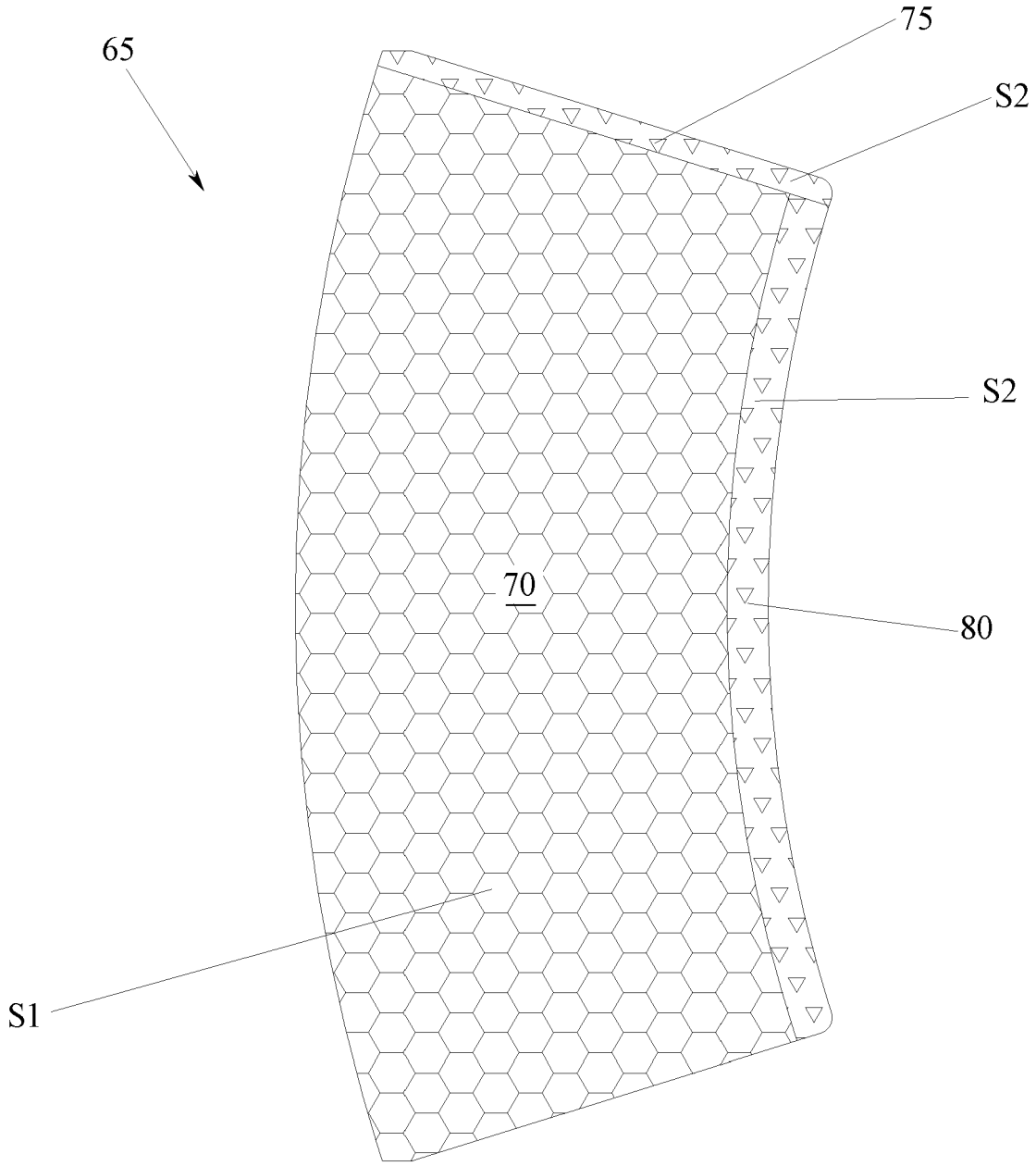

FIG.9

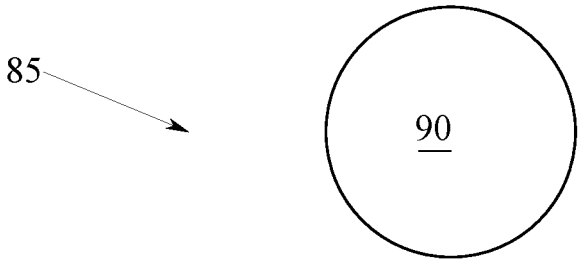

FIG.10

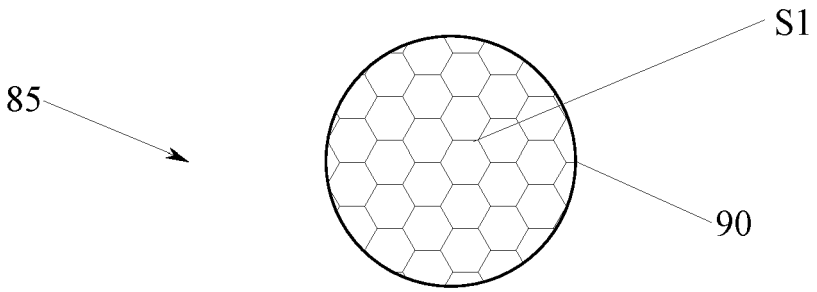

FIG.11

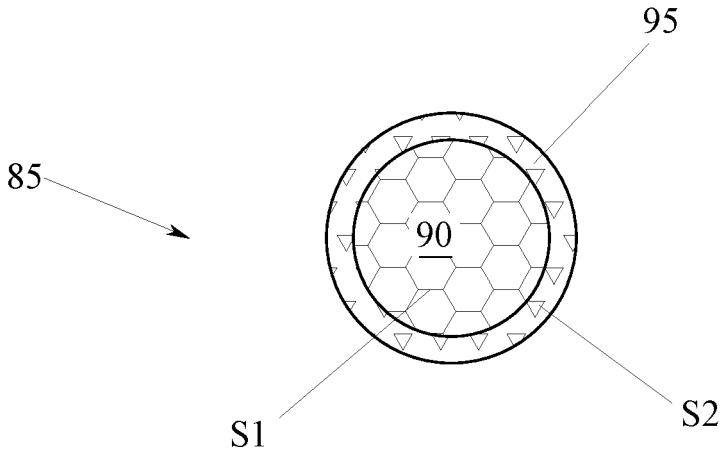

FIG.12

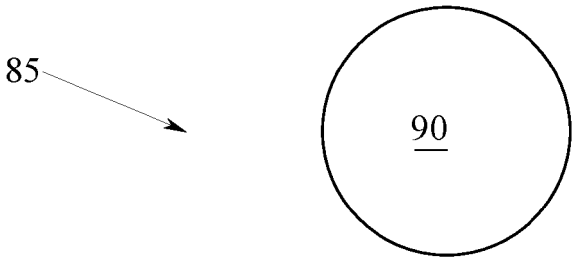

FIG.13

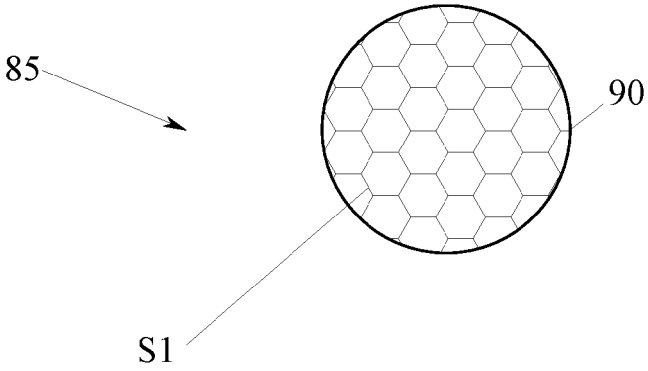

FIG.14

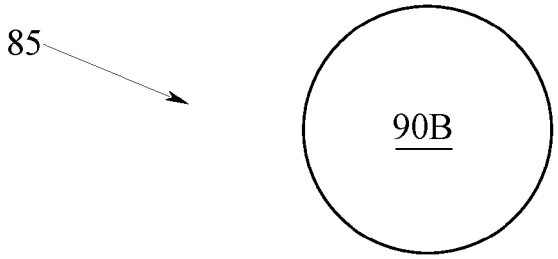

FIG.15

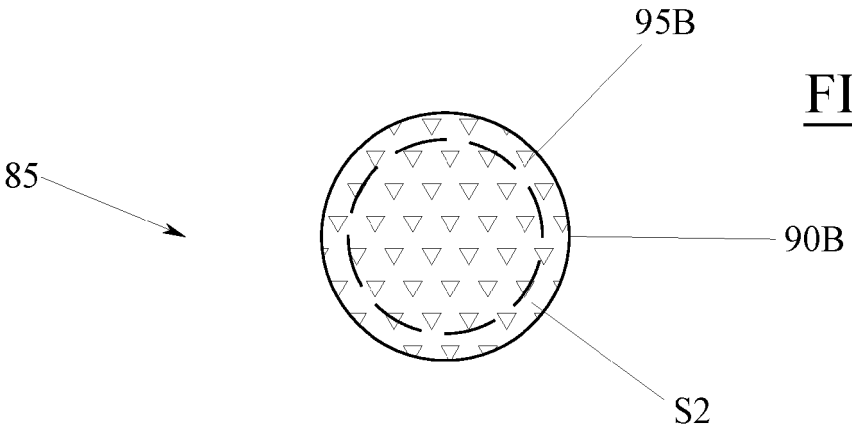

FIG.16

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EUROPEAN SEARCH REPORT

Application Number
EP 22 15 6081

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2012/064478 A1 (MEADWESTVACO CORP [US]; YAN ZHIQUAN Q [US]) 18 May 2012 (2012-05-18) * paragraphs [0032] - [0034] *	1-11	INV. B65D81/38
A	US 2006/196923 A1 (TEDFORD RICHARD A JR [US]) 7 September 2006 (2006-09-07) * paragraphs [0026], [0030] - [0032]; figure 6 *	1-11	

TECHNICAL FIELDS SEARCHED (IPC)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	22 June 2022	Jervelund, Niels

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22-06-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2012064478 A1	18-05-2012	NONE	
US 2006196923 A1	07-09-2006	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82