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(54) Heat insulating cup and method of manufacturing the same

Isolierter Becher und Verfahren zu seiner Herstellung

Gobelet isolant et procédé pour sa fabrication

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Description

[0001] The present invention relates to a method of manufacturing a heat-insulating cup according to the preamble of claim 1. Furthermore, the invention relates to a heat-insulating cup according to the preamble of claim 13.

[0002] From the document EP-0 458 081 A3 a generic heat-insulating cup is known. This heat-insulating cup comprises a cup body and a paper protective cover attached to cover a side wall of the cup body. The paper protective cover consists of an embossed sheet into which embossed dots are pressed.

[0003] A known heat insulating clip comprises a paper cup body and a paper protective cover of a heat insulating structure surrounding the cup body. The cup of this type can be readily disposed of when discarded. Also, the cup materials can be used again, if necessary.

[0004] A cup comprising a cup body and a corrugated board attached to the cup body to surround it is disclosed in, for example, JP-U-50-27080, said corrugated board comprising two liner boards, i.e., thick sheets, and a corrugated paper sheet sandwiched between these liner boards. In this prior art, it is necessary to form the two liner boards, which are tough, in truncated cone shapes differing from each other in the circumferential length such that the corrugated board can be wound smoothly to conform with the shape of the cup body. The requirement for the particular shapes leads to a troublesome operation for preparing the liner boards. In addition, the corrugated board tends to elastically peel off the cup body. If an external force exceeding an elastic limit is applied to the corrugated board, the liner boards of the corrugated board are wrinkled so as to impair the appearance of the cup.

[0005] Technique for overcoming the above-noted problems is disclosed in, for example, JP-A-54-1178. It is disclosed that a large number of cuts are imparted to the outer liner board of a corrugated board so as to facilitate the winding of the corrugated board into a cylindrical shape. However, the cylindrical body thus formed is rendered poor in its heat insulating property. In addition, the appearance of the cylindrical body is not satisfactory.

[0006] The object of the present invention is to provide a heat insulating cup adapted for mass production at a low cost.

[0007] Moreover, a heat insulating cup shall be provided exhibiting a good outer appearance.

[0008] Furthermore, a heat insulating cup shall be provided in which a protective cover is strongly adhered to a cup body.

[0009] Additionally a heat insulating cup shall be provided exhibiting a low feeling temperature when the cup containing hot contents is held by a person.

[0010] Moreover, a heat insulating cup shall be provided whose surface effectively prevents human fingers from slipping when the cup is held by a person.

[0011] Finally a heat insulating cup shall be provided which can be released easily when a plurality of cups are telescopically superposed one upon the other.

[0012] The above-stated object is achieved by means of the features defined in the characterizing part of claim 1. Preferred embodiments of the method of manufacturing a heat-insulating cup according to claim 1 are set forth in the dependent claims 2 to 12, respectively. The above-stated object is also achieved by means of the features defined in the characterizing part of claim 13. Preferred embodiments of the heat-insulating cup according to claim 13 are defined in the dependent claims 14 to 30, respectively.

[0013] This invention can be more fully understood from the following detailed description when taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view, partly broken away, showing a heat insulating cup according to one embodiment of the present invention together with a lid shown away from the cup;
FIG. 2 is a front view, partly broken away, showing the heat insulating cup shown in FIG. 1;
FIG. 3 is a cross sectional view showing the side wall of the cup body included in the heat insulating cup shown in FIG. 1;
FIG. 4 is a cross sectional view showing the liner board used in the heat insulating cup shown in FIG. 1;
FIG. 5 is a flow chart showing the process of manufacturing the heat insulating cup shown in FIG. 1;
FIG. 6 is a plan view showing how an adhesive is applied to a blank of a protective cover;
FIG. 7 is a plan view showing a modification of the blank of a protective sheet and also showing how an adhesive is applied to the blank;
FIG. 8 is a plan view showing a modified manner of applying an adhesive to a blank of a protective sheet;
FIG. 9 is a plan view showing a modification of a blank of a protective sheet;
FIG. 10 is a plan view showing another modification of a blank of a protective sheet;
FIG. 11 is a cross sectional view showing a modification of a flange portion of the heat insulating cup shown in FIG. 1;
FIGS. 12A to 12D collectively show a process of forming the flange portion shown in FIG. 11;
FIG. 13 is a plan view showing a modification of a liner board;

FIG. 14 is a cross sectional view showing a modification of the side wall of the cup body;

FIG. 15 shows a process of manufacturing a raw material sheet used for forming the side wall shown in FIG. 14;

FIG. 16 is a front view, partly broken away, showing a heat insulating cup according to another embodiment of the present invention;

FIGS. 17A and 17B are a cross sectional view along line XVII-XVII shown in FIG. 16 and a cross sectional view showing a modification of the heat insulating cup shows, in FIG. 16, respectively;

FIG. 18 shows a process of manufacturing the heat insulating cup shown in FIG. 16;

FIG. 19 is a perspective view, partly broken away, showing a heat insulating cup according to another embodiment of the present invention together with a cap shown away from the cup;

FIG. 20 is a perspective view partly broken away, showing a modification of the heat insulating cup shown in FIG. 19;

FIG. 21 is a perspective view, partly broken away, showing another modification of the heat insulating cup shown in FIG. 19.

[0014] FIG. 1 is a perspective view, partly broken away, showing a heat insulating cup 10 according to one embodiment of the present invention, with FIG. 2 being a front view, partly broken away, showing the heat insulating cup 10 shown in FIG. 1. A lid 11 of the cup 10 is shown in a detached fashion from the cup 10.

[0015] The cup 10 comprises a cup body 12 having a paper side wall 14 formed in a truncated cone shape, which is turned upside down, and a bottom wall 16. The side wall 14 is prepared by winding a paper board in a truncated cone shape such that side end portions 15 of the wound paper board are allowed to overlap with each other, followed by adhering the overlapping and portions 15 of the wound paper board to each other. On the other hand, the bottom wall 16 has a short cylindrical leg portion, which is engaged with the lower end portion of the side wall 14. Further, the lower end portion of the side wall 14 is folded inward to have the leg portion of the bottom wall 16 wrapped therein. As a result, the lower end portion of the resultant cup body is sealed.

[0016] The circumferential upper open end portion of the side wall 14 is folded outward such that the folded portion makes at least one complete turn so as to form a flange portion 18 serving to reinforce the cup body 12. The sheet-like lid 11 is attached to the flange portion 18. The lid 11 is made of paper or a laminate structure including a paper sheet, e.g., a laminate structure consisting of a paper sheet and an aluminum foil adhered to the paper sheet. An adhesive layer is formed on the lower surface of the lid 11. After loading of contents in the cup body 12, the lid 11 is attached to the flange portion 18 of the side wall 14. It is possible to mount a cap 11A made of a blank of a transparent resin to the flange portion 18 as shown in FIG. 19 in place of using the sheet-like lid 11.

[0017] The heat insulating cup 10 also comprises a protective cover 20 covering substantially the entire region of the outer surface of the side wall 14 of the cup body 12. The protective cover 20 is of a multi-layer structure comprising an embossed paper sheet 24 attached to cover the entire outer surface of the side wall 14 and a paper liner board 28 attached to cover the entire region of the embossed paper sheet 24.

[0018] Each of the side wall 14 and bottom wall 16 of the cup body 12 is made of a white, high-quality paper board having a basis weight of about 210 g/m^2 and a thickness of about 280 μm. As shown in FIG. 3, a polyethylene film 13 having a thickness of about 45 μm is formed by coating on the inner surface of the paper board used for forming the side wall 14 of the cup body 12. Such a polyethylene film is also formed on the inner surface of the paper board used for forming the bottom wall 16. It is desirable for the paper board used for forming the side wall 14 to have a basis weight falling within a range of between 170 g/m^2 and 310 g/m^2 and a thickness falling within a range of between 220 μm and 420 μm. On the other hand, the thickness of the polyethylene film 13 should desirably fall within a range of between 20 μm and 60 μm.

[0019] The embossed paper sheet 24 is made of a white, bleached kraft paper, and has a basis weight of 120 g/m^2. Embossment 25 consisting of a large number of embossed points is formed in the entire region of the embossed paper sheet 24. These embossed points of the embossment 25 are arranged to form first rows extending in a direction making an angle of about 45° with the axis of the cup body 12 and second rows crossing the first rows at substantially the right angles. It is necessary for the embossment 25 not to be collapsed by the ordinary use of the cup 10. Also, the embossed paper sheet 24 is required to be processed easily. In order to meet these requirements, it is desirable for the embossed paper sheet 24 to have a basis weight falling within a range of between 50 g/m^2 and 180 g/m^2. It should be noted that a bleached kraft paper is made of long fibers and, thus, is unlikely to be broken when an embossing treatment is applied thereto.

[0020] To be more specific, the embossed points of the embossment 25 consist of circular projections and circular recesses each having a diameter of about 3.5 mm, and being alternately arranged equidistantly. The whole of the projections and the whole of the recesses are respectively arranged to form lattices extending in directions making an angle of about 45° relative to the axis of the cup body 12 and complementarily overlapping each other. The density of the embossed points of the embossment 25 including both the projections and recesses is $7/cm^2$. The height of the embossment 25, which is a vertical distance between the top of the projection and the bottom of the recess and which

is uniform over the entire region of the embossed paper sheet 24, is set at about 2 mm.

[0021] The heat insulating air layer formed within the protective cover 20 is substantially defined by the shape and size of the embossment 25. In view of the desired heat insulating properties of the cup 10, the diameter of the projection and recess forming the embossed points of the embossment 25 should fall within a range of between 2 mm and 5 mm. The height of the embossment 25 should desirably fall within a range of between 1 mm and 5 mm. The density of the embossed points of the embossment 25 should desirably fall within a range of between 3/cm^2 and 25/cm^2. In the embodiment shown in FIG. 2, the embossment 25 consists of circular projections, i.e., projections each having a circular cross section, and circular recesses. In addition, it is possible for the embossment 25 to consist of rectangular projections and rectangular recesses sized substantially equal to the circular projections and circular recesses described previously. Further, a wave pattern can be used in place of projections and recesses formed in the embossed paper sheet 24.

[0022] The paper liner board 28 has a basis weight of 230 g/m^2. Letters or patterns designating a trade name or the like are indicated on the front surface of the liner board 28 by means of off-set or gravure printing. It is desirable for the liner board 28 to have a basis weight falling within a range of between 180 g/m^2 and 270 g/m^2. If the basis weight exceeds the upper limit of 270 g/m^2, the liner board 28 is rendered unduly rigid, making it troublesome to handle the liner board for preparing the protective cover 20. On the other hand, if the basis weight is lower than the lower limit of 180 g/m^2, the rigidity and mechanical strength of the liner board 28 are lowered. As a result, projections and recesses conforming with the embossment 25 are formed on the surface of the liner board. Further, the protective cover 20 mounted to the cup body 12 is likely to be broken during transfer or storage of the heat insulating cup 10. As shown in FIG. 4, ink layers 29 for denoting letters or patterns are formed on the liner board 28. Further, a varnish layer 30 is formed in a thickness of between 3 μm and 15 μm to over the entire surface of the liner board 28. The surface of the varnish layer 30, which is made of, for example, an OP (over-printing) varnish, a peeling varnish, etc., is finished smooth.

[0023] The cup body 12, embossed paper sheet 24 and liner board 28 are adhered to each other with synthetic adhesives including, for example, vinyl acetate type adhesive, and ethylene vinyl acetate (EVA) type adhesive. It is possible to use various other known adhesives, e.g., a starch type adhesive. However, in the case of using a starch type adhesive, projections and recesses conforming with the embossment 25 are likely to be formed on the surface of the liner board 28. Such being the situation, it is particularly desirable to use the vinyl acetate type adhesive and ethylene vinyl acetate (EVA) type adhesive for adhering the liner board 28 to the embossed paper sheet 24.

[0024] FIG. 5 shows a process of manufacturing the heat insulating cup shown in FIGS. 1 and 2. A known cup-forming apparatus is used for preparing the cup body 12. In the first step, a sectoral sheet 102 is wound in a truncated cone shape to form the side wall 14. On the other hand, a circular sheet 104 is wound along its periphery to form the bottom wall 16. These side wall 14 and bottom wall 16 are combined to form a master form 106 of the cup body 12, followed by folding outward, or curling, the open upper end portion of the cup body 12 to form the flange portion 18. Then, an annular embossed line or mark 19 is formed along the outer circumferential surface of the side wall 14. The annular ebmossed line 19 is used as a marking when a liquid such as hot water is poured into the cup.

[0025] On the other hand, the protective cover 20 is prepared by a system including a known roll embossing apparatus, a known combining machine and a known die-cutting apparatus. Specifically, a sheet roll 108 of a white, bleached kraft paper used as a base paper of the embossed paper sheet 24 and a sheet roll 112 of the liner board 28 are set in the system. A gravure printing and varnish coating is applied in advance to the surface of the raw material sheet of the liner board 28 by using a printer 114, etc. By this printing, letters or patterns denoting the trade name, etc. are imparted to the surface of the raw material sheet of the liner board 28.

[0026] The bleached kraft paper sheet released from the sheet roll 108 is embossed by an embossing roller 116 to prepare a raw material sheet of the embossed paper sheet. Then, one surface of the raw material sheet is supplied with an adhesive, e.g., vinyl acetate type adhesive, by an application roller 118. In the embodiment shown in FIG. 5, the adhesive application is performed after the embossing treatment. However, it is possible to carry out the adhesive application simultaneously with the embossing treatment.

[0027] A sheet is released from the sheet roll 112 for the liner board 28 in synchronism with the release of the bleached kraft paper sheet such that the released liner board 28 is superposed on the adhesive-applied surface of the raw material sheet of the embossed paper sheet 24. Under this condition, the raw material sheet of the liner board 28 is adhered to the raw material sheet of the embossed paper sheet 24 by a pair of clearance rollers 122 and a pressing belt 124. A predetermined clearance is provided between the paired rollers 122. Also, a spring force is applied to one of these rollers such that the one roller is elastically movable toward the other roller. Because of the particular construction, the liner board and the embossed paper sheet can be adhered to each other without collapsing the embossment 25 formed on the surface of the embossed paper sheet.

[0028] The raw material sheets of the embossed paper sheet 24 and the liner board 28 adhered to each other is cut by a cutter 126 into intermediates 128 each having a predetermined width. Then, these intermediates 128 are successively die-cut in conformity with the letters or patterns printed on the liner board 28 so as to obtain a sectoral blank 32

of the protective cover 20, the blank 32 having a size conforming with the size of the circumferential side surface of the cup body 12. In the manufacturing process shown in FIG. 5, it is possible to omit the step of forming the intermediate 128 such that the sectoral blank 32 of the protective cover 20 can be directly prepared by die-cutting.

[0029] The blank 32 is, then, supplied with an adhesive, e.g., an ethylene vinyl acetate type adhesive, by an application roller 132. Further, the adhesive-applied blank 32 is attached to the side wall 14 of the cup body 12 so as to form the heat insulating cup 10 comprising the cup body 10 and the protective cover 20. The adhesive-applied blank 32 can be attached to the side wall 14 by using a winding apparatus. In this case, the blank 32 is adhered by the adhesive to the side wall 14 during the winding process of the blank 32 about the side wall 14 of the cup body 12. The winding method permits the side end portions of the blank 32 not to overlap each other but to butt against each other in adhering the blank 32 to the side wall 14.

[0030] A fitting method can be employed in place of the winding method for attaching the blank 32 of the protective cover 20 to the side wall 14 of the cup body 12. In the fitting method, the blank 32 is wound in advance into a truncated cone shape substantially conforming with the side wall 14 of the cup body 12, followed by fitting the wound blank 32 over the side wall 14. In this fitting step, the blank 32 is adhered by an adhesive to the side wall 14 of the cup body 12. The blank 32 of the protective cover 20 is provided with an adhesive-application space or marginal portion, to which an adhesive is applied, at one side end portion as described herein later, with the result that the side end portions of the protective cover 20 are allowed to overlap each other.

[0031] An adhesive may be applied to the entire region on the back surface of the blank 32 for attaching the protective cover 20 to the cup body 12. It is also possible to apply the adhesive selectively to band-like side end regions of the blank 32. Further, it is desirable to apply the adhesive to the blank 32 as shown in FIG. 6.

[0032] FIG. 6 shows that the blank 32 includes three band-like first regions 34 to which an adhesive is applied with a pressure by an application roller, said first regions 34 consisting of two side end regions 34 in the vicinity of first and second side ends 33a, 33b and a central region 34. The blank 32 also includes two second regions 35 to which an adhesive is applied without a pressure by a spray, the two second regions 35 being interposed between the three first regions 34. The protective cover 20 is adhered by these adhesive to the side wall 14 of the cup body 12. These adhesives applied to the first and second regions 34 and 35 may be the same adhesive, e.g., an ethylene vinyl acetate adhesive, differ from each other in the application amount.

[0033] As described above, the three first regions 34 of the blank of the protective cover 20 shown in FIG. 6 are supplied with the adhesive in a pressurized state. Also, the two second regions 35 are supplied with the adhesive in a non-pressurized state and in an amount smaller than the application amount to the first regions 34. As a result, the amount of the adhesive consumption can be decreased. Also, it is possible to avoid various problems such as deformation of the cup body 12, the protective cover 20, etc. and the peeling at the side end portion of the protective cover 20, which are caused by the shrinkage of the adhesive when the adhesive is dried. Further, the heat transmission via the adhesive layer to the outer surface of the protective cover 20 can be diminished in the region other than the first regions 34 so as to lower the feeling temperature of the heat insulating cup 10 felt by the user. What should also be noted is that the protective cover 20 is adhered to the cup body 12 by the second regions 35 interposed between the three first regions 34, with the result that the protective cover 20 is prevented from floating or being deviated. It follows that the present invention permits solving various problems that the heat insulating cup is felt unreliable when held by the user, that a surface roughness is likely to occur on the protective cover 20, and that the protective cover 20 tends to be detached from the cup body 12 when the adhesive is once peeled.

[0034] FIG. 5 shows that an adhesive spray 134 is disposed downstream of the application roller 132. In this embodiment, the three first regions 34 of the blank 32 are supplied with an adhesive by the roller 132, followed by spraying an adhesive against the second regions 35 by the spray 134. As described previously, these adhesive applied to first and second regions, which may be the same adhesive, e.g., an ethylene vinyl acetate adhesive, differ from each other in the application amount. For example, in terms of the adhesive concentration in the application step, the application amount to the first regions 34 should fall within a range of between 0.1 g/cm^2 and 0.5 g/cm^2, while the application amount to the second regions 35 should fall within a range of between 0.005 g/cm^2 and 0.1 g/cm^2. It is necessary to set the application amount to the first regions 34 at a certain amount, but is desirable to make the application amount to the second regions 35 small. Where the application amount to the second regions 35 is too large, the protective cover 20 is apt to be wrinkled so as to impair the adhering between the cup body 12 and the protective cover 20.

[0035] As described above, the application roller 132 and the application spray 134 are used for applying the adhesives to the first and second regions 34 and 35, respectively, of the blank 32, making it possible to supply these regions 34 and 35 with desired amounts, differing from each other, of the adhesives. These adhesives of the first and second regions are generally applied to the blank 32 in different steps, but are applied substantially consecutively, with the result that the through-put of the heat insulating cup is not substantially lowered.

[0036] FIG. 7 shows a blank 32 having an adhesive-application space or a marginal portion 36 to be supplied with an adhesive and be overlapped. In addition, the first and second regions 34 and 35 are arranged in manners different from those shown in FIG. 6. The first band-like regions 34 are positioned at the side end portions, and the second oblong

region 35, which is laterally elongated, is positioned substantially at the center of the blank 32. These two first regions 34 are supplied with an adhesive by the application roller 132, with the second oblong region 35 being supplied with an adhesive by the spray 134.

[0037] FIG. 8 shows another modification of the blank 32. In this case, the blank 32 comprises five first regions 34 including two triangular regions at the side end portions and three band-like regions in the central portion. The blank 32 also comprises four oblong second regions 35, which are vertically elongated and positioned between the adjacent first regions 34. These first and second regions 34 and 35 are supplied with adhesives by the application roller 132 and the spray 134, respectively.

[0038] As apparent from FIGS. 7 and 8, it is possible to modify in various fashions the number, positions and shapes of the first and second regions, respectively. However, it is necessary for the first regions to include band-like regions at the side ends of the blank 32. Also, it is desirable for the second region to be positioned in substantially the central region sandwiched between adjacent first regions.

[0039] As another modification, it is possible to apply an adhesive with a pressure to the inner surface of the blank 32 by an application roller, and to apply an adhesive without a pressure to the outer surface of the side wall 14 by a spray, thereby attaching the protective cover 20 to the side wall 14 with these adhesives. In this case, it is necessary for the first regions, on which an adhesive is applied with a pressure by an application roller, to include band-like regions at the side ends of the blank 32. The second region, on which an adhesive is applied without a pressure by a spray, may be the entirety of the outer surface of the side wall 14, or a selected portion or portions thereof. Where the second region consists of a selected portion or portions of the outer surface of the side wall 14, it is desirable for the second region to be selected to correspond to the central position between the first regions, as the second regions 35 on the blank 32 shown in FIGS. 6, 7 and 8.

[0040] In this modification, since an adhesive is applied to the side wall 14 of the cup body 12 without a pressure by a spray, the adhesive can be uniformly applied to a selected position on the side wall 14 with a predetermined application amount, regardless of the curved surface of the side wall 14.

[0041] FIG. 9 shows another modification of the blank 32 of the protective cover 20, which is assembled in advance into a cylinder of a truncated cone shape and is fit over and adhered to the outer surface of the cup body. In this case, the blank 32 comprises adhesive-application spaces 36a and 36b at the side end portions. The adhesive-application space 36a is equal in its shape and function to the adhesive-application space 36 shown in FIG. 7. The adhesive-application space 36b is also coated with an adhesive. In addition, the adhesive-coating space 36b allows a side 36c of the blank 32 to abut against a conveyor guide in the step of transferring the blank 32, with the result that the blank 32 is held perpendicular to its transferring direction.

[0042] Further, the blank 32 shown in FIG. 9 comprises two straight perforations 37 each extending across the width of the blank 32. Incidentally, the upper and lower arcs of the blank 32 are concentric. As apparent from the drawing, each of these two perforations 37 extends toward the center of the two concentric circles including the upper and lower arcs of the blank 32. These two perforations 37 are arranged substantially equidistant from the center of the blank 32. Each hole of these perforations 37 extends through both the embossed paper sheet 24 and the liner board 28 so as to lower the rigidity of the blank 32 and to give directionality in the step of winding the blank 32. In other words, the perforation 37 permits the blank 32 to be wound easily and as desired in the step of forming the protective cover 20 around the side wall 14 of the cup body 12. It is important to determine appropriately the size of the hole and distance between adjacent holes of the perforation 37 in order to prevent the blank 32 from being broken when wound to prepare the protective cover 20. Specifically, the size of the hole and the distance between adjacent holes of the perforation 37 should be set at 5 mm to 8 mm. The perforation 37 can be formed in the die-cutting step for preparing the blank 32.

[0043] An experiment was conducted in order to look into the effect produced by the perforation 37, as follows. In this experiment, prepared were samples 1 to 5 of the blank 32, said samples differing from each other in the type of a folding line, so as to measure the folding strength of the sample along the folding line. Also measured were treatability and finished state in folding the blank 32 for preparing the protective cover 20. The experimental conditions and results are shown in Table 1. Sample 1 shown in Table 1 corresponds to the blank 32 shown in FIG. 9. The perforation 37 in Sample 1 consisted of holes each sized 5 mm and arranged 5 mm apart from each other. For forming the perforation 37, die-cutting was applied on the side of the liner board 28 of the blank 32. Samples 2 to 5 shown in Table 1 denote control cases. In these samples, the folding lines were formed as shown in Table 1. Specifically, the term "Ruled Line 1" denotes a groove 1.0 mm wide. The term "Back Cut" denotes a groove formed by cutting the embossed paper sheet 24 alone with a cutter blade. Further, the term "Ruled Line 2" denotes a groove of a small width formed by a cutter blade. It should be noted that, in forming the folding lines, working tools were applied in different directions in preparing Samples 1 to 5. Concerning the working direction shown in Table 1, the term "Front" denotes that a working tool was put in direct contact with the liner board 28 when the working was started, with the term "Back" denoting that the working tool was put in direct contact with the embossed paper sheet 24 when the working was started. Each of the treatability and finished state was evaluated by "◯" denoting "good", "△" denoting "fair", and "X" denoting "poor".

Table 1

Sample	Working Direction	Folding Line	Treatability	Finished State	Folding Strength (g)
1	Front	Perforation	○	○	64
2	Back	Ruled Line 1	X	X	69
3	Front	Ruled Line 1	X	X	79
4	Back	Back Cut and Ruled Line 2	△	○	66
5	Back	Back Cut	X	○	74

[0044] Table 1 clearly shows that Sample 1 was superior to Samples 2 to 5 in any of the folding strength, workability and finished state.

[0045] FIG. 10 shows still another modification of the blank 32 of the protective cover 20 shown in FIG. 9. In this case, a cut-out 38 is formed at each of the upper and lower ends of each of the two perforations 37 so as to facilitate the winding of the blank 32 along these perforations 37. Of course, the presence of these cut-outs 38 serves to ensure the winding of the blank 32. Desirably, the cut-outs 38 should be about 3 mm long. These cut-outs 38 can be formed in the die-cutting step of the blank 32 together with the perforation 37.

[0046] The blank 32 shown in FIG. 10 also comprises an adhesive-application space 36. The upper and lower ends of the space 36 are defined by oblique sides 39 each inclined by about 15° relative to the upper or lower arc of the blank 32. Where these oblique sides 39 are inclined as shown in FIG. 10, the adhesive-application space 36 is unlikely to be exposed to the surface even if the blank 32 is wound to form a truncated cone shape which is somewhat deviant from the predetermined shape. In other words, the presence of the space 36 makes it possible to prevent the appearance of the resultant protective cover 20 from being impaired even if winding of the blank 32 is somewhat unsatisfactory.

[0047] FIG. 11 is a cross sectional view showing a modification of the flange portion 18. In this modification, the upper end portion of the side wall 14 of the cup body 12 is folded outward and curled to make at least about one complete turn. Then, the curled portion is crushed by pressing in a vertical direction such that the curled portion may be flattened. The inner surface of the flange portion 18 is not in an adhesive condition, and the self-restoring force of the flange portion 18 causes the lower surface of the flange portion 18 to abut against an upper end portion 20a of the protective cover 20. As a result, the flange portion 18 is prevented from being further deformed by its self-restoring force. It should also be noted that a gap G appearing on the outer surface of the protective cover 20 between the upper end of the protective cover 20 and the lower end of the flange portion 18 is decreased to 0.5 mm or less.

[0048] In the conventional heat-insulating cup, a gap of at least about 1.0 mm is formed between the protective cover and the flange portion of the cup body because of the requirement of operating a tool for mounting the protective cover to the cup body. The large gap noted above is likely to catch a cup handling arm. In the modification shown in FIG. 11, however, the gap in question is decreased to 0.5 mm or less so as to eliminate the above-noted trouble.

[0049] The flange portion 18 is crushed by pressing in a vertical direction so as to have a flat surface. As a result, the area of the flat surface, which is brought into contact with the lid 11, of the flange portion 18 is increased so as to ensure satisfactory sealing properties. In addition, even if the curled portion before formation of the flange portion 18 has the same size, the overhanging length L of the flange portion 18 from the protective cover 20 is increased, compared with the case where the curled portion is not crushed. It follows that the heat-insulating cup is prevented from being dropped from a conveyor holder of the transferring apparatus. In this modification, the overhanging length L is set to fall within a range of between 1.5 mm and 2.5 mm.

[0050] FIGS. 12A to 12D collectively show to form the flange portion 18 shown in FIG. 11. Specifically, after formation of the master form 106 of the cup body 12 as shown in FIG. 5, the side wall 14 of the cup body 12 is folded outward along its open upper peripheral region and, then, wound to make at least one complete turn to form a curled portion 42, as shown in FIG. 12A.

[0051] In the next step, the curled portion 42 is flattened by crushing under heat and pressure so as to form the flange portion 18 having an upper plate 44 and a lower plate 46, as shown in FIG. 12B. In this step, the curled portion 42 is not crushed completely. To be more specific, a free space should be provided within the flange portion 18. In addition, the upper plate 44 and the lower plate 46 should not be adhered to each other. In this embodiment, the inner surface alone of the side wall 14 is coated with a polyethylene film 13, as shown in FIG. 14. It follows that, even if the curled portion 42 is completely crushed, the upper plate 44 is not adhered to the lower plate 46. Also, the tip of the curled portion 42 is not adhered to the upper portion of the side wall 14. However, it is desirable for the curled portion 42 not to be crushed completely because the self-restoring force of the flange portion 18 is utilized in the subsequent step.

[0052] Immediately after crushing of the curled portion 42, the protective cover 20 is adhered to the side wall 14 of the cup body 12, as shown in FIG. 12C. As described previously, the upper plate 44 and the lower plate 46 are not adhered to each other within the flange portion 18, with the result that the flange portion 18 is caused by its self-restoring force to be deformed back into the original shape of the curled portion 42, as shown in FIG. 12D. In other words, the lower plate 46 is deformed toward the upper edge 20a of the protective cover 20 so as to decrease the width of a gap appearing along the outer surface of the protective cover 20 between the protective cover 20 and the flange portion 18. Desirably, the flange portion should be deformed to cause the lower plate 46 to abut against the upper edge 20a of the protective cover 20, as shown in FIG. 11, so as to prevent the flange portion 18 from being further deformed by its self-restoring force.

[0053] As described above, the flange portion 18 is formed by crushing flat the curled portion 42 so as to increase the contact area between the lid 11 and the flange portion 18 and, thus, to increase the overhanging length of the flange portion 18 from the edge of the protective cover 20. Further, the width of the gap G between the protective cover 20 and the flange portion 18 can be decreased to a desired value of 0.5 mm or less by utilizing the self-restoring force of the flange portion 18. For utilizing the self-restoring force of the flange portion 18, it is important to select appropriately the position of the upper edge 20a of the protective cover 20 and the material of the side wall 14. It is also important to prevent the upper plate 44 and the lower plate 46 of the flange portion 18 from being adhered to each other.

[0054] FIG. 13 is a plan view showing the surface of the liner board 28 according to a modification of the present invention. In this modification, a surface embossment 48 consisting of projected and recessed lattice pattern is formed on the entire outer surface of the liner board 28. The lattice pattern of the embossment 48 is defined by a large number of grooves including first grooves extending in a direction making an angle of about 45° with the axis of the cup body 12 and second grooves crossing the first grooves at substantially right angles. The average distance between the first grooves and between the second grooves is about 1 mm. In other words, the average width of the lattice element is set at about 1 mm. Further, the embossment 48 has an average roughness, defined by ten points mean roughness (JIS B 0601), of about 54 μm.

[0055] The raw material sheet of the liner board 28 passing through the printer 114 shown in FIG. 5 is further passed through an embossing roll for forming the embossment 48 thereon. After formation of the embossment 48, the raw material sheet roll 112 of the liner board 28 is set in an apparatus for adhering the embossed liner board 24 to the raw material sheet.

[0056] It is desirable for the embossment 48 to have the average width of the lattice element falling within a range of between 500 μm and 1500 μm. Also, the average roughness, defined by the ten points mean roughness, of the embossment 48 should desirably fall within a range of between 40 μm and 100 μm, with the greatest roughness less than 120 μm. If the lattice width and the surface roughness noted above are greater than the upper limits noted above, the letters or patterns put on the outer surface of the heat insulating-cup are unlikely to be recognized easily and clearly. By contraries, if the lattice width and the surface roughness are smaller than the lower limits of the ranges noted above, the effective temperature of the heat-insulating cup is felt higher by the user. In addition, the surface of the cup tends to cause slipping. Incidentally, patterns other than the embossment 48 can be formed on the surface of the liner board 28. For example, a so-called "dot-pattern" consisting of a large number of projections and recesses, each being substantially equal in size to the lattice element in the embossment 48, can be formed on the surface of the liner board 28.

[0057] In the case of using the modified liner board 28 described above, the protective cover 20 consists of the embossed paper sheet 24 having the embossment 25 of the large points and the liner board 28 having the embossment 48 of the lattice pattern formed thereon, said liner board 28 covering the outer surface of the embossed paper sheet 24. The particular construction permits the letters or patterns formed on the outer surface of the protective cover 20 to be visually recognized easily and accurately. Also, the surface of the protective cover 20 is unlikely to slip when held by the user. Further, the large embossed points of the embossment 25 formed in the embossed paper sheet 24 serve to effectively suppress the heat transmission to the outer surface of the protective cover 20. In addition, the small embossed lattice pattern of the embossment 48 formed on the liner board 28 serve to lower the effective temperature of the heat-insulating cup, which is felt by the user when the cup is held.

[0058] FIG. 14 is a cross sectional view showing a modification of the side wall 14 of the cup body 10. In this modification, a matting treatment is applied to the polyethylene film 13 covering the inner surface of the side wall 14 so as to form a matted surface 13a. The matted surface should have have an average roughness, defined by the ten points mean roughness (JIS B 0601), of 10 μm to 30 μm. If the average roughness of the matted surface is smaller than the lower limit of the above-noted range, blocking is likely to take place. On the other hand, if the average roughness noted above is larger than the upper limit of the range noted above, the matting treatment itself is rendered difficult. The average roughness, defined by the ten points mean roughness, of the matted surface should not be larger than 60% of the thickness of the polyethylene film 13. Otherwise, pin holes tend to be formed in the polyethylene film 13, leading to a low reliability in resistance to water permeation. Incidentally, other resin films which can be heat-sealed such as a polyester film can be used in place of the polyethylene film 13.

[0059] In the modification shown in FIG. 14, the inner surface of the side wall 14 of the cup body 12 is covered with a

plastic layer such as the polyethylene film 13 having a relatively rough surface, i.e., a roughness, defined by the ten points mean roughnesse, of 10 μm to 30 μm. As a result, even if a large number of heat insulating cups are telescopically superposed one upon the other, the individual cups can be released easily from the superposed arrangement in spite of the fact that the protective cover 20 has a high elasticity. If the outer surface of the liner board 28 is covered with a varnish layer, the release of the individual cups from the superposed arrangement can be further facilitated. Further, the plastic layer should have a rougheness, defined by the ten points mean roughness, which should not be larger than 60% of the thickness of the plastic layer, so as to prevent pin holes from being formed in the plastic layer.

[0060] Experiments were conducted in order to confirm the effect produced by the matting treatment and to look into the relationship between the matting treatment applied to the surface of the polyethylene film 13 and the varnish layer formed to cover the outer surface of the liner board 28. In these experiments, the static frictional force and coefficient of static friction between a polyethylene film having a matted surface and a varnish layer having a smooth surface were measured on the basis of JIS K 7125. Table 2 shows experimental data of Samples A-D used in these experiments. In Table 2, "Roughness" denotes the ten points mean roughness of the polyethylene film, and "Varnish Layer" denotes a type of the varnish layer. Samples A and B were prepared to correspond to the side wall 14 shown in FIG. 14, while samples C and D were prepared to have a less matted surface, static frictional forces (gf) and coefficients of static friction measured in the experiments are shown in "SFC" and "CSF", respectively, in Table 2.

Table 2

Sample	Roughness (μm)	Varnish Layer	SFC (gf)	CSF
A	21.9	Peeling Varnish	44.45	0.222
B	21.9	OP Varnish	46.10	0.231
C	5.0	Peeling Varnish	49.00	0.245
D	5.0	OP Varnish	54.25	0.271

[0061] As apparent from Table 2, the coefficient of static friction for Samples A and B is smaller than that for Samples C and D. This clearly supports that the matting treatment applied to the polyethylene film 13 as shown in FIG. 14 permits the individual heat-insulating cups, which are telescopically superposed one upon the other during storage, to be released easily from the superposed arrangement.

[0062] FIG. 15 shows how to apply a matting treatment to the polyethylene film 13 formed to cover the side wall 14 of the cup body 12. In the first step, prepared is a raw material sheet of the side wall 14 of the cup body 12. As shown in FIG. 15, a molten polyethylene is supplied from an extruder 144 to the raw material sheet 140 released from a sheet roll 142 to coat the raw material sheet 140 with a polyethylene film. Then, the polyethylene film formed to cover the raw material sheet 140 is cooled with a cooling roller 146 having the surface which has been subjected to a matting treatment. As a result, a matting treatment is applied to the surface of the polyethylene film formed to cover the raw material sheet 140 when the raw material sheet 140 is moved along the surface of the cooling roller 146. Further, the raw material sheet 140 after the cooling and matting treatments is taken up as a sheet roll 148.

[0063] FIG. 16 is a front view, partly broken away, showing a heat insulating cup according to another embodiment of the present invention, with FIG. 17A being a cross sectional view along line XVII-XVII shown in FIG. 16. The reference numerals which were already explained in conjunction with the embodiment shown in FIGS. 1 and 2 are also used in FIGS. 16 and 17A for denoting the same members of the cup.

[0064] In the embodiment shown in FIGS. 16 and 17A, the protective cover 20 is of a multi-layer structure comprising a first thin paper sheet 22 formed to cover the entire outer surface of the side wall 14, the embossed paper sheet 24 formed to cover the entire region of the first thin paper sheet 22, a second thin paper sheet 26 formed to cover the entire region of the embossed paper sheet 24, and the paper liner board 28 formed to cover the entire region of the second thin paper sheet 26.

[0065] The embossed paper sheet 24 and the liner board 28, which were already described in conjunction with FIG. 2, are used in the embodiment shown in FIGS. 16 and 17A. The first thin paper sheet 22 is opaque white, exhibits medium duty white roll characteristics, and should have a basis weight of about 30 g/m^2. Likewise, the second thin paper sheet 26 is opaque white, exhibits medium duty white roll characteristics, and should have a basis weight of about 30 g/m^2.

[0066] The first thin paper sheet 22 co-operates with the liner board 28 to prevent the embossed paper sheet 24 from being warped, to improve the adhering strength between the cup body 12 and the protective cover 20, and to facilitate the automatic roll feeding or sheet-by-sheet feeding of the embossed paper sheet 24 so as to improve the productivity of the heat insulating cups. To meet these requirement, the first thin paper sheet 22 is required to exhibit a reasonable

mechanical strength and rigidity. To be more specific, the first thin paper sheet 22 is required to have a basis weight falling within a range of between 20 g/m^2 and 100 g/m^2. If the basis weight exceeds the upper limit of this range, the first thin paper sheet 22 is rendered unduly rigid, leading to a low processibility in preparing the protective cover 20. On the other hand, if the basis weight is lower than the lower limit of the above-noted range, the rigidity and mechanical strength of the first thin paper sheet 22 are rendered unduly low. It follows that the first thin paper sheet 22 is likely to be broken during the manufacturing process of the protective cover 20. Also, the sheet 22 is incapable of sufficiently preventing the embossed paper sheet 24 from being warped.

[0067] The second thin paper sheet 26 is intended to prevent the liner board 28 from bearing grooves or the like conforming with projections or the like formed on the surface of the embossed paper sheet 24, to prevent the outer surface of the liner board 28 from bearing traces of adhering so as not to impair the outer appearance, and to facilitate the automatic roll feeding or sheet-by-sheet feeding of the embossed paper sheet 24 so as to improve the productivity of the heat insulating cups. To meet these requirement, the second thin paper sheet 26 is required to exhibit a reasonable mechanical strength and rigidity. To be more specific, the second thin paper sheet 26 is required to have a basis weight falling within a range of between 20 g/m^2 and 100 g/m^2. If the basis weight exceeds the upper limit of this range, the second thin paper sheet 26 is rendered unduly rigid, leading to a low processibility in preparing the protective cover 20. On the other hand, if the basis weight is lower than the lower limit of the above-noted range, the rigidity and mechanical strength of the second thin paper sheet 26 are rendered unduly low. It follows that the second thin paper sheet 26 is likely to be broken during the manufacturing process of the protective cover 20.

[0068] FIG. 18 shows how to manufacture the protective cover included in the heat insulating cup shown in FIG. 16. In the first step, an embossing treatment is applied to a white, bleached kraft paper sheet released from a sheet roll 152 so as to prepare a raw material sheet of the embossed paper sheet 24 bearing the embossment 25. Then, the both surfaces of the raw material sheet of the embossed paper sheet 24 are supplied with an adhesive, e.g., vinyl acetate type adhesive, by pasting rollers 156 and 158. The adhesive application can be performed immediately after or simultaneously with the embossing treatment.

[0069] In synchronism with the release of the bleached kraft paper sheet from the roll 152, the first and second thin paper sheets 22 and 26 are released from the raw sheet rolls 162 and 164, respectively, so as to be superposed on the upper and lower surfaces of the raw material sheet of the embossed paper sheet 24 and, then, adhered to the raw material sheet of the embossed paper sheet 24 by a pair of clearance rollers 166 and a pressing belt 168. One of the paired rollers 166 is fixed and the other roller is elastically urged toward said one roller by a spring force such that a predetermined clearance is formed between the paired rollers. The particular construction permits the first and second thin paper sheets 22 and 26 to be adhered to the embossed paper sheet 24 without collapsing the embossment 25.

[0070] The raw material sheet having the first and second thin paper sheets 22 and 26 adhered to the embossed paper sheet 24 is cut by a cutter 172 to prepare intermediates 165 each having a predetermined width. The intermediate 165 is sized such that a plurality of the protective covers 20 can be prepared from each intermediate 165.

[0071] On the other hand, an off-set printing by a printer 176 or a varnish coating is applied to the surface of the raw material sheet of the liner board 28 in order to obtain a raw material sheet roll 174 of the liner board 28. By this printing, letters or patterns relating to the trade name of the heat-insulating cup are imparted to the surface of the raw material sheet of the liner board 28, said surface forming the outer surface of the protective cover 20 of the resultant heat insulating cup. Then, the raw material sheet of the liner board 28 is cut by a cutter 178 to prepare intermediates 175 equal in size to the intermediates 165.

[0072] Further, the intermediates 165 are stacked one upon the other and automatically fed one by one by a feeder 182, followed by supplying the second thin paper sheet 26 of the intermediate 165 with an adhesive, e.g., vinyl acetate type adhesive, by an adhesive-application roller 186. The intermediates 175 are also stacked one upon the other and fed one by one by a feeder 184 in synchronism with the feeding of the intermediate 165 such that the intermediate 175 is superposed on the adhesive-applied surface of the intermediate 165 and adhered to the intermediate 165 by a pair of clearance rollers 188 and a pressing belt 192 so as to obtain an intermediate 194 of the adhered structure. One of the paired rollers 188 is fixed, with the other roller being elastically movable by a spring force toward said one roller, with the result that the intermediates 165 and 175 can be adhered to each other without collapsing the embossment 25 of the embossed paper sheet 24.

[0073] The intermediate 194 of the adhered structure, which comprises a plurality of sectoral regions each having the letters or patterns relating to the trade name of the heat insulating cup printed thereon, is die-cut in the subsequent step to obtain a plurality of sectoral blanks 32 of the protective cover 20. Further, the protective cover 20 is attached to the cup body 12 as described previously so as to obtain a heat-insulating cup as shown in FIG. 17.

[0074] In the manufacturing process shown in FIG. 18, a plurality of intermediates 165 each including the embossed paper sheet 24 are stacked one upon the other. In this step, however, the projections/recesses, i.e., embossment 25, of the embossed paper sheets 24 included in the adjacent intermediates 165 are not engaged with each other because the first and second thin paper sheets 22 and 26 are adhered in advance to the surfaces of each embossed paper sheet 24. As a result, the intermediates 165 can be automatically fed one by one for the adhering of the liner board 28 to the

intermediate 165 in the subsequent step, leading to an improved productivity of the heat-insulating cup. Further, the second thin paper sheet 26 prevents the liner board 28 from bearing traces of the adhering operation and from bearing the irregularity conforming with the surface state of the embossed paper sheet 24. In short, the second thin paper sheet 26 is effective for preventing the appearance of the heat-insulating cup from being impaired.

[0075] The first thin paper sheet 22 of the protective cover 20 is adhered with an adhesive to the side wall 14 of the cup body 12 for fixing the protective cover 20 to the cup body 12. It follows that, even if the protective cover 20 is wound about the side wall 14 in the adhering step, the protective cover 20 can be adhered without fail to the cup body 12. Also, a point-to-point adhering is achieved between the first thin paper sheet 22 and projections of the embossed paper sheet 22 and between the second thin paper sheet 26 and projections of the embossed paper sheet 22. The adhering operation is performed on a flat plane or a curved plane of a large curvature radius. Also, each of the first and second thin paper sheets 22 and 26 can be deformed as desired. It follows that the first and second thin paper sheets 22 and 26 can be adhered satisfactorily to the embossed paper sheet 24.

[0076] In the manufacturing process shown in FIG. 18, the intermediates 165 of a predetermined width are automatically fed one by one for formation of the intermediates 194. However, the automatic feeding from a roll as shown in FIG. 5 can be employed in place of the feeding performed one by one. Specifically, the raw material sheets of the first and second thin paper sheets 22 and 26 are adhered to the upper and lower surfaces of the embossed paper sheet 24 to obtain a laminate structure, followed by taking up the laminate structure as a first roll before cutting, said roll corresponding to the roll 108 shown in FIG. 5. On the other hand, letters or patterns are consecutively printed on the surface of the raw material sheet before cutting of the liner board 28, followed by taking up the raw material sheet printed with letters or the like as a second roll corresponding to the roll 112 shown in FIG. 5. Then, these raw material sheets are released from the first and second rolls in synchronism with each other such that the raw material sheet of the liner board 28 is adhered to the second thin paper sheet 26 of the raw material sheet of the laminate structure released from the first roll. Further, the resultant adhered sheet is cut to obtain the intermediates 194 of a predetermined size, or to obtain directly the sectoral blank 32 of the protective cover 20.

[0077] In the modified process described above, it is possible not to take up the first roll, but to feed the adhered raw material sheets 22, 24 and 26 as they are, and to directly combine them with the raw material sheet of the liner board 28 fed from the second roll.

[0078] Further, any one of the first and second thin paper sheets 22 and 26 can be added to the protective cover 20 shown in FIG. 2, comprising the embossed paper sheet 24 and the liner board 28. In this case, the projections/recesses, i.e., embossment 25, of the embossed paper sheets 24 included in the adjacent intermediates stacked one upon the other are not engaged with each other. It follows that the embossed paper sheet 24 can be automatically fed from a roll or automatically fed one by one easily, leading to an improved productivity and a low manufacturing cost of the heat insulating cup.

[0079] Where the first thin paper sheet 22 alone is adhered to the protective cover 20 comprising the embossed paper sheet 24 and the liner board 28, as shown in particularly FIG. 17B, an area-to-area contact is achieved between the first thin paper sheet 22 and the cup body 12, leading to an improved adhering strength between the cup body 12 and the protective cover 20. Also, the embossed paper sheet 24 is sandwiched between the first thin paper sheet 22 and the liner board 28. It follows that the embossed paper sheet 24 is prevented from deformation such as warping with time so as to ensure a high adhering strength between the cup body 12 and the protective cover 20 over a long period of time.

[0080] In the case of adding the second thin paper sheet 26 alone to the protective cover 20, the second thin paper sheet 26 prevents the liner board 28 from bearing an irregularity conforming with the surface state of the embossed paper sheet 24 or from bearing traces of the adhering operation, so as to prevent the appearance of the heat insulating cup from being impaired.

[0081] FIG. 19 is a perspective view, partly broken away, showing a heat insulating cup 10 according to another embodiment of the present invention, said cup 10 including a cap 11A which is shown away from the cup 10. The reference numerals which were already explained in conjunction with the embodiment shown in FIGS. 1 and 2 are also used in FIG. 19 for denoting the same members of the cup.

[0082] In this embodiment, a black horizontal line 52 is drawn as a marking line over substantially the entire outer circumferential surface of the side wall 14 of the cup body 12 so as to provide a criterion in pouring, for example, hot water into the cup. The marking line 52 can be printed with a black ink using, for example, a carbon black on the paper board used for preparing the side wall 14. The marking line 52 should be printed such that, when the paper board printed with the line 52 is wound to form the side wall 14, both ends of the line 52 should be aligned so as to enable the line 52 to designate a predetermined liquid level within the cup.

[0083] The cap 11A made of a transparent resin molding is mounted to the flange portion 18 of the side wall 14. It is possible to use the cap 11A made of paper. Further, a sheet-like lid 11 as shown in FIG. 1 can be mounted in place of the cap 11A to the flange portion 18.

[0084] The protective cover 20 used in the embodiment of FIG. 19 is of a multi-layer structure consisting of the first thin paper sheet 22, the embossed paper paper sheet 24 and the paper liner board 28. However, the protective cover

20 may be of other multi-layer structure. For example,the protective cover 20 may consist of the embossed paper sheet 24 and the liner board 28 as shown in FIG. 2, or may consist of the first thin paper sheet 22, the embossed paper sheet 24, the second thin paper sheet 26 and the liner board 28, as shown in FIG. 16. Further, the protective cover 20 may be formed of the embossed paper sheet alone, as shown in FIG. 22 which is to be described later.

[0085] The marking line 52 should be visually recognized from within the cup body 12 covered with the protective cover 20. In order to facilitate the visual recognition, it is important to determine appropriately the materials and other conditions of the side wall 14 and the line 52. Of course, it is most desirable for the line 52 to be visually recognized by only the light from within the cup body 12. In view of these requirements, the paper board used for forming the side wall 14 should have a basis weight falling within a range of between 170 g/m^2 and 310 g/m^2 and should have a thickness falling within a range of between 220 μm and 420 μm. The Munsell system brightness Bw of the color of side wall 14 should be 6 to 10, preferably 8 to 10. The Munsell system brightness Bm of the color of the marking line 52 should be 0 to 7, preferably 0 to 5. Further, it is important to meet the condition: $Bw - Bm \geq 3$.

[0086] For facilitating the visual recognition of the marking line 52, it is also important to meet the condition of $Bc - Bm \geq 1$, where Bc denotes the Munsell system brightness of the color of the thin paper sheet 22, which is the color of the inner surface of the protective cover 20. Further, the value of Bc should fall within a range of between 6 and 10, preferably between 8 and 10. Incidentally, it has been experimentally confirmed that, in the case of using the marking line 52 having the Munsell system brightness of 0, the marking line 52 can be slightly recognized visually even if the Munsell system brightness on the inner surface of the protective cover 20 is very close to zero. Where the thin paper sheet 22 is excluded from the protective cover 20, the inner surface of the protective cover 20 is defined by the embossed paper sheet 24. It follows that the color of the embossed paper sheet 24 is determined in accordance with the above-noted conditions for selecting the color of the thin paper sheet 22.

[0087] If the basis weight and thickness of the pasteboard used for forming the side wall 14 are higher than the upper limits of the ranges described previously, it is difficult to visually recognize easily the marking line 52. On the other hand, if these basis weight and thickness are lower than the lower limits of the ranges described previously, the paper board fails to have a rigidity and mechanical strength required for the cup body 12. If the Munsell system brightness Bw of the paper board used for forming the side wall 14 is lower than the lower limit of the range described previously, it is difficult to visually recognize easily the marking line 52. It is also difficult to visually recognize easily the marking line 52, if the Munsell system brightness Bm of the marking line 52 is higher than the upper limit of the range described previously. It is desirable for each of the paper board used for forming the side wall 14, the thin paper sheet 22 and the marking line 52 to be colorless, though it is acceptable for these members of the cup to be colored. Further, the marking line 52, which is a single straight line in the embodiment of FIG. 19, may be replaced by, for example, a broken line, a double line, a linear arrangement of small triangles, dots, letters, numerals, etc.

[0088] FIG. 20 is a perspective view, partly broken away, showing a modification of the heat insulating cup shown in FIG. 19. In the modification shown in FIG. 20, an open widow 54, which is laterally oblong, is formed in the protective cover 20 so as to expose partly the marking line 52 formed on the outer circumferential surface of the cup body 12. The window 54 can be formed in the die-cutting step of the blank 32 of the protective cover 20, with the result that the window 54 can be formed with no substantial increase in the manufacturing cost of the heat insulating cup. Also, since the marking line 52 is printed along the entire outer circumferential surface of the side wall 14 of the cup body 12, a horizontal position of the window 54 need not be aligned with the marking line 52.

[0089] The window 54 permits the marking line 52 to be visually recognized from within the cup body 12 by utilizing the external light, with the result that the marking line 52 can be visually recognized more easily. This makes it unnecessary to take the Munsell system brightness of the color of the inner surface of the protective cover 20, i.e., the thin paper sheet 22, into consideration, though it is necessary to take the particular brightness into consideration in the heat insulating cup shown in FIG. 19. However, since it is necessary to utilize the external light for visually recognizing the marking line 52, it is necessary for the paper board used for forming the side wall 14 to have a basis weight of 170 g/m^2 to 310 g/m^2 and a thickness of 220 μm to 420 μm. On the other hand, the Munsell system brightness Bw of the color of side wall 14 should be 6 to 10, preferably 8 to 10. The Munsell system brightness Bm of the color of the marking line 52 should be 0 to 8, preferably 0 to 7. Further, it is important to meet the condition: $Bw - Bm \geq 2$.

[0090] It is desirable for each of the pasteboard used for forming the side wall 14 and the marking line 52 to be colorless, though it is acceptable for these members of the cup to be colored. Further, the marking line 52, which is exposed by the open window 54 and is formed of a single straight line in the modification shown in FIG. 20, may be replaced by, for example, a broken line, a double line, a linear arrangement of small triangles, dots, letters, numerals, etc.

[0091] The window 54 facilitates the visual recognition of the marking line 52 from within the cup. In addition, the surface level of the liquid poured into the cup can be recognized through the window 54 from outside the cup. In other words, the surface level of the liquid poured into the cup can be compared with the marking line 52. In this fashion, the window 54 is highly useful in the case where the user of the cup is unable to peep into the cup.

[0092] It is possible to enlarge the window 54 or to provide a plurality of windows 54 so as to further facilitate the visual recognition of the marking line 52. It should be noted, however, that, if the open area made by the window 54 is unduly

large, the heat insulating properties of the cup are lowered.

[0093] FIG. 21 is a perspective view, partly broken away, showing another modification of the heat insulating cup shown in FIG. 19. In the modification of FIG. 21, the marking line 52 is not drawn at all on the cup body 12. Also, a triangular window 56 is formed in the protective cover 20. The window 56 can be formed in the die-cutting step for forming the blank 32 of the protective cover 20, with the result that the window 56 can be formed with no substantial increase in the manufacturing cost of the heat insulating cup.

[0094] The window 56 can be recognized from within the heat insulating cup by utilizing the external light, with the result that the contour itself of the window 56 can be used a mark of criterion. This makes it unnecessary to draw a marking line 52 as in the heat insulating cup shown in FIG. 19. It is also unnecessary to make the Munsell system brightness of the color on the inner surface of the protective cover 20, i.e., the thin paper sheet 22, into consideration. However, since it is necessary to recognize the contour of the window 56 by utilizing the external light, it is necessary for the paper board used for forming the side wall 14 to have a basis weight falling within a range of between 170 g/m^2 and 310 g/m^2 and a thickness falling within a range of between 220 μm and 420 μm.

[0095] As described above, the window 56 can be recognized from inside the cup, making it possible to use the widow 56 as a marking criterion. In addition, the surface level of the liquid poured into the cup can be recognized through the window 56 from outside the cup. It follows that the surface level of the liquid poured into the cup can be compared with the marking criterion by utilizing the window 56. In this fashion, the window 56 is highly useful in the case where the user of the cup is unable to peep into the cup.

[0096] It is possible to enlarge the window 56 or to provide a plurality of windows 56 so as to further facilitate the visual recognition of the marking criterion. It should be noted, however, that, if the open area made by the window 56 is unduly large, the heat insulating properties of the cup are lowered.

Claims

1. A method of manufacturing a heat-insulating cup (10) consisting of a cup body (12) having a paper side wall (14) and a paper bottom wall (16) and a paper protective cover (20) attached to cover the side wall of said cup body, said protective cover (20) comprising an embossed paper sheet (24), said method being
characterized by the steps of:

   adhering a first raw material sheet of said embossed paper sheet (24) and a second raw material sheet of a liner board (28) to each other with a first adhesive;
   die-cutting the adhered structure of the first and second raw material sheets to prepare a blank (32) of the shape of said protective cover (20);
   supplying said blank (32) with a second adhesive; and
   winding said blank (32) such that said liner board (28) is positioned outside;
   and adhering the wound blank (32) as said protective cover (20) to the side wall (14) of the cup body (12).

2. The method according to claim 1,
characterized in that
said step of adhering the wound blank (32) to the side wall (14) of the cup body (12) comprises the substeps of:

   imparting said second adhesive to said blank (32); and
   adhering said blank (32) to said side wall (14) with said second adhesive while winding the blank around the side wall.

3. The method according to claim 2,
characterized in that
both side end portions (33a, 33b) of said blank (32) are arranged opposite each other in adhering the blank to the side wall (14).

4. The method according to claim 1,
characterized in that
said step of adhering the wound blank (32) to the side wall (14) of the cup body (12) comprises the substeps of:

   assembling said blank (32) into a cone whose inner shape conforms with the outer shape of said cup body; and
   adhering said cone to the side wall (14) while fitting it over the side wall (14) of the cup body (12).

5. The method according to claim 1,

characterized in that
said step of adhering said first raw material sheet to said second raw material sheet comprises the substeps of:

preparing said first raw material sheet by applying an embossing treatment (116) to a sheet released from a first sheet roll (108);
imparting said first adhesive to said first raw material sheet simultaneously with or after said embossing treatment; and
adhering said second raw material sheet of said liner board (28), which is released from a second sheet roll (112) in synchronism with the release of the sheet from said first sheet roll (108), to said first raw material sheet with said first adhesive.

6. The method according to claim 1,
characterized by further comprising the steps of:

outwardly folding an open upper circumferential end region of said side wall (14) of the cup body (12) such that the folded portion makes at least one complete turn to form a curled portion (42);
pressing said curled portion (42) in a vertical direction to collapse said curled portion flat, thereby to form a flange portion (18) having an upper plate (44) and a lower plate (46) which are not adhered to each other within said flange portion; and
adhering said protective cover (20) to said side wall (14) immediately after said pressing step of the curled portion (42) such that the flange portion is deformed by its self-restoring force, thereby to decrease a distance between the lower plate (46) of the flange portion (18) and an upper end (20a) of the protective cover (20).

7. The method according to claim 6,
characterized by further comprising the step of allowing the lower surface of said lower plate (46) of the flange portion (18) to abut against the upper end portion (20a) of the protective cover (20) so as to prevent the flange portion from being further deformed by its self-restoring force.

8. The method according to claim 1,
characterized in that
said second adhesive comprises a first part imparted with a pressure to two band-like first regions (34) formed at side end regions of said blank (32) of the protective cover (20) and a second part imparted without a pressure to at least one second region (35) arranged on said blank outside said two first regions.

9. The method according to claim 8,
characterized in that
said second adhesive further comprises a third part imparted along with said first part with said pressure to a band-like region (34) along a center line of the blank (32) of the protective cover (20).

10. The method according to claim 1,
characterized in that
said second adhesive comprises a first part imparted with a pressure to two band-like first regions (34) formed at side end regions of said blank (32) of the protective cover (20) and a second part imparted without a pressure to at least one second region arranged on said side wall (14).

11. The method according to claim 10,
characterized in that
said second adhesive further comprises a third part imparted along with said first part with said pressure to a band-like region (34) along a center line of the blank (32) of the protective cover (20).

12. The method according to claim 1,
characterized in that
said protective cover further comprises a thin paper sheet (22, 26) arranged on at least one surface of said embossed paper (24) sheet and having a basis weight falling within a range of between 20 g/m^2 and 100 g/m^2, and said method further comprises the steps of:

adhering a third raw material sheet of said thin paper sheet (22, 26) to the first raw material sheet of said embossed paper sheet (24);

adhering said second raw material sheet of said liner board (28) to one of said first and third raw material sheets to prepare a laminated sheet consisting of said first, second and third raw material sheets; and
die-cutting said laminated sheet to prepare said blank (32) of the protective cover (20).

13. A heat-insulating cup, comprising:

a cup body (12) having a paper side wall (14) and a paper bottom wall (16); and
an embossed paper protective cover (20) attached to cover the side wall of said cup body,
characterized in that
said protective cover (20) is prepared by winding a blank (32) of a multi-layer structure including said embossed paper sheet (24) and a paper liner board (28) adhered to said embossed paper sheet, said blank (32) being wound such that said liner board (28) is positioned outside, and adhering said blank (32) to said cup body.

14. The heat-insulating cup according to claim 13,
characterized in that
said embossed paper sheet (24) has a basis weight falling within a range of between 50 g/m^2 and 180 g/m^2, and said liner board (28) has a basis weight falling within a range of between 180 g/m^2 and 270 g/m^2.

15. The heat-insulating cup according to claim 13,
characterized in that
said blank (32) of the protective cover (20) is adhered to the side wall (14) of said cup body (12) such that both side end portions (33a, 33b) of the blank are arranged opposite each other.

16. The heat-insulating cup according to claim 13,
characterized in that
an inner surface of said side wall (14) is covered with a plastic layer (13) having a thickness of 20 to 60 μm, and a matting treatment (13a) is applied to the surface of said plastic layer to enable the plastic layer to have a ten points mean roughness falling within a range of between 10 μm and 30 μm, which is not more than 60 % of the thickness of said plastic layer.

17. The heat-insulating cup according to claim 16,
characterized in that
an outer surface of said liner board (28) is covered with a varnish layer (30).

18. The heat-insulating cup according to claim 13,
characterized in that
a surface embossment (48) is formed on the outer surface of the liner board (28) to form a projected and recessed pattern, elements of said projected and recessed pattern having an average width falling within a range of between 500 μm and 1500 μm, and said surface embossment (48) having a ten points mean roughness falling within a range of between 40 μm and 100 μm.

19. The heat-insulating cup according to claim 13,
characterized by further comprising
a flange portion (18) prepared by folding outward an open upper circumferential end region of said side wall (14) of said cup body (12) such that the folded portion makes at least one complete turn, followed by pressing in a vertical direction said folded portion, said folded portion being prevented from adhered inside, and a position of an upper end portion (20a) of the protective cover (20) and a material of the side wall (14) being selected such that a gap appearing along the outer surface of the protective cover between the protective cover (20) and the flange portion (18) has a width diminished to 0.5 mm or less by deformation of the flange portion caused by its self-restoring force.

20. The heat-insulating cup according to claim 19,
characterized in that
a lower surface of said flange portion (18) abuts against the upper end portion (20a) of the protective cover (20) so as to prevent said flange portion from being further deformed by its self-restoring force.

21. The heat-insulating cup according to claim 13,
characterized in that

said protective cover (20) is adhered to said side wall with an adhesive, which comprises a first part imparted with a pressure to two band-like first regions (34) formed at side end regions of said blank (32) of the protective cover (20), and a second part imparted without a pressure to at least one second region (35) interposed between the two first regions.

22. The heat-insulating cup according to claim 21,
characterized in that
said adhesive further comprises a third part imparted along with said first part with said pressure to a band-like region (34) along a center line of said blank (32) of the protective cover (20).

23. The heat-insulating cup according to claim 13,
characterized in that
said protective cover (20) further comprises a thin paper sheet (22, 26) arranged on at least one surface of said embossed paper sheet (24) and having a basis weight falling within a range of between 20 g/m^2 and 100 g/m^2.

24. The heat-insulating cup according to claim 23,
characterized in that
said thin paper sheet (22, 26) is arranged between said side wall (14) and said embossed paper sheet (24).

25. The heat-insulating cup according to claim 13,
characterized in that
said protective cover (20) further comprises a perforation (37) serving to facilitate the winding operation.

26. The heat-insulating cup according to claim 25,
characterized in that
said protective cover (20) further comprises cut-outs (38) formed at the upper and lower ends of said perforation (37).

27. The heat-insulating cup according to claim 13,
characterized in that
a marking (52) as a criterion of liquid pouring into the cup (10) is printed on an outer surface of said side wall (14) of the cup body (12); said side wall (14) is formed of a paper sheet having a basis weight falling within a range of between 170 g/m^2 and 310 g/m^2 and a thickness falling within a range of between 220 μm and 420 μm; the paper sheet of said side wall (14) has a Munsell system brightness Bw of a color falling within a range of between 6 and 10; said marking (52) has a Munsell system brightness Bm of a color falling within a range of between 0 and 7; and the relationship $Bw - Bm \geq 3$ is satisfied.

28. The heat-insulating cup according to claim 13,
characterized in that
a marking (52) as a criterion of liquid pouring into the cup (10) is printed on an outer surface of said side wall (14) of the cup body (12); an open window (54) is formed in said protective cover (20) to expose at least partly said marking (52); said side wall (14) is formed of a paper sheet having a basis weight falling within a range of between 170 g/m^2 and 310 g/m^2 and a thickness falling within a range of between 220 μm and 420 μm; the paper sheet of said side wall (14) has a Munsell system brightness Bw of a color falling within a range of between 6 and 10; said marking (52) has a Munsell system brightness Bm of a color falling within a range of between 0 and 8; and the relationship $Bw - Bm \geq 2$ is satisfied.

29. The heat-insulating cup according to claim 13,
characterized in that
an open window (56) acting as a marking as a criterion of liquid pouring into the cup (10) is formed in said protective cover (20); and said side wall (14) is formed of a paper sheet having a basis weight falling within a range of between 170 g/m^2 and 310 g/m^2 and a thickness falling within a range of between 220 μm and 420 μm.

30. The heat-insulating cup according to claim 13,
characterized in that
an annular embossed line (19) acting as a marking as a criterion of liquid pouring into the cup (10) is formed on the side wall (14).

Patentansprüche

1. Verfahren zum Herstellen eines wärmeisolierten Bechers (10), der aus einem Becherkörper (12) mit einer Papierseitenwand (14) und einer Papierbodenwand (16) und einer Papierschutzabdeckung (20) besteht, die zum Abdekken der Seitenwand des Becherkörpers angebracht ist, wobei die Schutzabdeckung (20) ein geprägtes Papierblatt (24) aufweist,
kennzeichnet durch
die folgenden Schritte:

   Anheften eines ersten Rohmaterialblattes des geprägten Papierblattes (24) und eines zweiten Rohmaterialblattes eines Deckkartons (28) aneinander mit einem ersten Haftmittel,
   Stanzen des gehefteten Aufbaus aus dem ersten und dem zweiten Rohmaterialblatt, um einen Rohling (32) mit der Form der Schutzabdeckung (20) herzustellen,
   Auftragen eins zweiten Haftmittels auf den Rohling (32),
   Herumschlagen des Rohlings (32) in einer derartigen Weise, daß der Deckkarton (28) an der Außenseite positioniert ist, und
   Anheften des herumgeschlagenen Rohlings (32) als die Schutzabdeckung (20) an der Seitenwand (14) des Becherkörpers (12).

2. Verfahren gemäß Anspruch 1,
dadurch gekennzeichnet, daß
der Schritt des Anheftens des herumgeschlagenen Rohlings (32) an der Seitenwand (14) des Becherkörpers (12) die folgenden Unterschritte aufweist:

   Auftragen des zweiten Haftmittels auf den Rohling (32) und
   Anheften des Rohlings (32) an der Seitenwand (14) mit dem zweiten Haftmittel, während der Rohling um die Seitenwand herumgeschlagen wird.

3. Verfahren gemäß Anspruch 2,
dadurch gekennzeichnet, daß
beide Seitenendabschnitte (33a, 33b) des Rohlings (32) beim Anheften des Rohlings an der Seitenwand (14) einander gegenüberstehend angeordnet sind.

4. Verfahren gemäß Anspruch 1,
dadurch gekennzeichnet, daß
der Schritt des Anheftens des herumgeschlagenen Rohlings (32) an der Seitenwand (14) des Becherkörpers (12) die folgenden Unterschritte aufweist:

   Zusammenbauen des Rohlings (32) zu einem Kegel, dessen Innenform mit der äußeren Form des Becherkörpers übereinstimmt, und
   Anheften des Kegels an der Seitenwand (14), während er über die Seitenwand (14) des Becherkörpers (12) eingepaßt wird.

5. Verfahren gemäß Anspruch 1,
dadurch gekennzeichnet, daß
der Schritt des Anheftens des ersten Rohmaterialblattes an das zweite Rohmaterialblatt die folgenden Unterschritte aufweist:

   Vorbereiten des ersten Rohmaterialblattes durch ein Anwenden einer Prägebehandlung (116) auf ein Blatt, das von einer ersten Blattrolle (108) kommt,
   Auftragen des ersten Haftmittels an dem ersten Rohmaterialblatt gleichzeitig mit der oder nach der Prägebehandlung und
   Anheften des zweiten Rohmaterialblattes des Deckkartons (28), das von einer zweiten Blattrolle (112) gleichzeitig mit dem Herauskommen des Blattes von der ersten Blattrolle (108) kommt, an dem ersten Rohmaterialblatt mit dem ersten Haftmittel.

6. Verfahren gemäß Anspruch 1,
gekennzeichnet durch

die weiteren Schritte:

Falten eines offenen oberen Umfangsendbereiches der Seitenwand (14) des Becherkörpers (12) nach außen in einer derartigen Weise, daß der gefaltete Abschnitt zumindest eine vollständige Umdrehung ausführt, um einen geringelten Abschnitt (42) auszubilden,
Drücken des geringelten Abschnittes (42) in einer vertikalen Richtung, um den geringelten Abschnitt flach zusammen zu drücken, wodurch ein Flanschabschnitt (18) mit einer oberen Platte (44) und einer unteren Platte (46), die innerhalb des Flanschabschnittes nicht aneinander geheftet sind, ausgebildet wird, und
Anheften der Schutzabdeckung (20) an der Seitenwand (14) unmittelbar nach dem Schritt des Drückens des geringelten Abschnittes (42) in einer derartigen Weise, daß der Flanschabschnitt aufgrund seiner Wiederherstellkraft verformt wird, wodurch der Abstand zwischen der unteren Platte (46) des Flanschabschnittes (18) und einem oberen Ende (20a) der Schutzabdeckung (20) sich verringert.

7. Verfahren gemäß Anspruch 6,
gekennzeichnet durch
den weitere Schritt

Ermöglichen eines Anliegens der unteren Fläche der unteren Platte (46) des Flanschabschnittes (18) an dem oberen Endabschnitt (20a) der Schutzabdeckung (20), um so zu verhindern, daß der Flanschabschnitt sich aufgrund seiner Wiederherstellkraft weiter verformt.

8. Verfahren gemäß Anspruch 1,
dadurch gekennzeichnet, daß
das zweite Haftmittel einen ersten Anteil, der unter Druck auf zwei bandartige erste Bereiche (34) aufgebracht wird, die an Seitenendbereichen des Rohlings (32) der Schutzabdeckung (20) ausgebildet sind, und einen zweiten Anteil, der ohne Druck auf zumindest einen zweiten Bereich (35) aufgebracht wird, der an dem Rohling außerhalb der beiden ersten Bereiche angeordnet ist, aufweist.

9. Verfahren gemäß Anspruch 8,
dadurch gekennzeichnet, daß
das zweite Haftmittel des weiteren einen dritten Anteil aufweist, der zusammen mit dem ersten Anteil unter Druck auf einen bandartigen Bereich (34) entlang einer Mittellinie des Rohlings (32) der Schutzabdeckung (20) aufgebracht wird.

10. Verfahren gemäß Anspruch 1,
dadurch gekennzeichnet, daß
das zweite Haftmittel einen ersten Anteil, der unter Druck auf zwei bandartige erste Bereiche (34) aufgetragen wird, die an Seitenendbereichen des Rohlings (32) der Schutzabdeckung (20) ausgebildet sind, und einen zweiten Anteil, der ohne Druck auf zumindest einen zweiten Bereich aufgetragen wird, der an der Seitenwand (14) angeordnet ist, aufweist.

11. Verfahren gemäß Anspruch 10,
dadurch gekennzeichnet, daß
das zweite Haftmittel des weiteren einen dritten Anteil aufweist, der zusammen mit dem ersten Anteil unter Druck auf einen bandartigen Bereich (34) entlang einer Mittellinie des Rohlings (32) der Schutzabdeckung (20) aufgetragen wird.

12. Verfahren gemäß Anspruch 1,
dadurch gekennzeichnet, daß
die Schutzabdeckung des weiteren ein dünnes Papierblatt (22, 26) aufweist, das an zumindest einer Fläche des geprägten Papierblattes (24) angeordnet ist und ein Grundgewicht innerhalb eines Bereiches zwischen 20 g/m^2 und 100 g/m^2 hat, wobei das Verfahren des weiteren die folgenden Schritte aufweist:

Anheften eines dritten Rohmaterialblattes des dünnen Papierblattes (22, 26) an dem ersten Rohmaterialblatt des geprägten Papierblattes (24),
Anheften des zweiten Rohmaterialblattes des Deckkartons (28) an entweder dem ersten oder dem dritten Rohmaterialblatt, um ein beschichtetes Blatt vorzubereiten, das aus dem ersten, dem zweiten und dem dritten Rohmaterial besteht, und

Stanzen des beschichteten Blattes, um den Rohling (32) der Schutzabdeckung (20) herzustellen.

13. Wärmeisolierter Becher mit

einem Becherkörper (12) mit einer Papierseitenwand (14) und einer Papierbodenwand (16) und einer geprägten Papierschutzabdeckung (20), die zum Abdecken der Seitenwand des Becherkörpers angebracht ist,
dadurch gekennzeichnet, daß
die Schutzabdeckung (20) hergestellt wird, indem ein Rohling (32) mit einem Mehrfachlagenaufbau herumgeschlagen wird, der das geprägte Papierblatt (24) und einen an dem geprägten Papierblatt angehefteten Papierdeckkarton (28) umfaßt, wobei der Rohling (32) derart herumgeschlagen wird, daß der Deckkarton (28) an der Außenseite positioniert ist, und der Rohling (32) an dem Becherkörper angeheftet ist.

14. Wärmeisolierter Becher gemäß Anspruch 13,
dadurch gekennzeichnet, daß
das geprägte Papierblatt (24) ein Grundgewicht innerhalb eines Bereiches zwischen 50 g/m^2 und 180 g/m^2 hat und der Deckkarton (28) ein Grundgewicht innerhalb eines Bereiches zwischen 180 g/m^2 und 270 g/m^2 hat.

15. Wärmeisolierter Becher gemäß Anspruch 13,
dadurch gekennzeichnet, daß
der Rohling (32) der Schutzabdeckung (20) an der Seitenwand (14) des Becherkörpers (12) in einer derartigen Weise angeheftet ist, daß beide Seitenendabschnitte (33a, 33b) des Rohlings einander gegenüberstehend angeordnet sind.

16. Wärmeisolierter Becher gemäß Anspruch 13,
dadurch gekennzeichnet, daß
eine Innenfläche der Seitenwand (14) mit einer Kunststofflage (13) bedeckt ist, die eine Dicke von 20 bis 60 µm hat, und eine Mattierungsbehandlung (13a) auf der Oberfläche der Kunststofflage angewendet wird, um zu ermöglichen, daß die Kunststofflage eine Rauhigkeit nach der Zehnpunkte-Durchschnittsrauhigkeit innerhalb eines Bereiches zwischen 10 µm und 30 µm hat, die nicht mehr als 60% der Dicke der Kunststofflage beträgt.

17. Wärmeisolierter Becher gemäß Anspruch 16,
dadurch gekennzeichnet, daß
die äußere Fläche des Deckkartons (28) mit einer Lacklage (30) bedeckt ist.

18. Wärmeisolierter Becher gemäß Anspruch 13,
dadurch gekennzeichnet, daß
eine Oberflächenprägung (48) an der äußeren Fläche des Deckkartons (28) zum Ausbilden eines mit Vorsprüngen und Vertiefungen versehenen Musters ausgebildet ist, wobei Elemente des mit Vorsprüngen und Vertiefungen versehenen Musters eine durchschnittliche Breite innerhalb eines Bereiches zwischen 500 µm und 1500 µm haben und die Oberflächenprägung (48) eine Rauhigkeit nach der Zehnpunkte-Durchschnittsrauhigkeit innerhalb eines Bereiches zwischen 40 µm und 100 µm hat.

19. Wärmeisolierter Becher gemäß Anspruch 13,
dadurch gekennzeichnet, daß
er des weiteren folgendes aufweist:

einen Flanschabschnitt (18), der durch ein Falten eines offenen oberen Umfangsendbereichs der Seitenwand (14) des Becherkörpers (12) nach außen in einer derartigen Weise vorbereitet wird, daß der gefaltete Abschnitt zumindest eine vollständige Umdrehung ausführt, woraufhin ein Drücken des gefalteten Abschnittes in einer vertikalen Richtung erfolgt, wobei verhindert wird, daß der gefaltete Abschnitt an der Innenseite anhaftet, und eine Position eines oberen Endabschnittes (20a) der Schutzabdeckung (20) und ein Material der Seitenwand (14) derart ausgewählt werden, daß ein entlang der äußeren Fläche der Schutzabdeckung vorhandener Zwischenraum zwischen der Schutzabdeckung (20) und dem Flanschabschnitt (18) eine Breite hat, die auf 0,5 mm oder weniger durch die Verformung des Flanschabschnittes verringert wird, die durch seine Wiederherstellkraft bewirkt wird.

20. Wärmeisolierter Becher gemäß Anspruch 19,

dadurch gekennzeichnet, daß
die untere Fläche des Flanschabschnittes (18) an dem oberen Endabschnitt (20a) der Schutzabdeckung (20) so anliegt, daß verhindert wird, daß der Flanschabschnitt durch seine Wiederherstellkraft weiter verformt wird.

21. Wärmeisolierter Becher gemaß Anspruch 13,
dadurch gekennzeichnet, daß
die Schutzabdeckung (20) an der Seitenwand mit einem Haftmittel angeheftet ist, das einen ersten Anteil, der unter Druck auf zwei bandartige erste Bereiche (34) aufgetragen wird, die an Seitenendabschnitten des Rohlings (32) der Schutzabdeckung (20) ausgebildet sind, und einen zweiten Anteil, der ohne Druck auf zumindest einen zweiten Bereich (35) aufgetragen wird, der zwischen den beiden ersten Bereichen angeordnet ist, aufweist.

22. Wärmeisolierter Becher gemäß Anspruch 21,
dadurch gekennzeichnet, daß
das Haftmittel des weiteren einen dritten Anteil aufweist, der längs des ersten Anteiles unter Druck auf einen bandartigen Bereich (34) längs einer Mittellinie des Rohlings (32) der Schutzabdeckung (20) aufgetragen ist.

23. Wärmeisolierter Becher gemäß Anspruch 13,
dadurch gekennzeichnet, daß
die Schutzabdeckung (20) des weiteren ein dünnes Papierblatt (22, 26) aufweist, daß an zumindest einer Fläche des geprägten Papierblattes (24) angeordnet ist und ein Grundgewicht innerhalb eines Bereiches zwischen 20 g/m^2 und 100 g/m^2 hat.

24. Wärmeisolierter Becher gemäß Anspruch 23,
dadurch gekennzeichnet, daß
das dünne Papierblatt (22, 26) zwischen der Seitenwand (14) und dem geprägten Papierblatt (24) angeordnet ist.

25. Wärmeisolierter Becher gemäß Anspruch 13,
dadurch gekennzeichnet, daß
die Schutzabdeckung (20) des weiteren eine Perforation (37) aufweist, die dem Erleichtern des Vorganges des Herumschlagens dient.

26. Wärmeisolierter Becher gemäß Anspruch 25,
dadurch gekennzeichnet, daß
die Schutzabdeckung (20) des weiteren Ausschnitte (38) aufweist, die an dem oberen und dem unteren Ende der Perforation (37) ausgebildet sind.

27. Wärmeisolierter Becher gemäß Anspruch 13,
dadurch gekennzeichnet, daß
eine Markierung (52) als ein Kriterium für die Flüssigkeit, die in dem Becher (10) gegossen wurde, an einer Außenfläche der Seitenwand (14) des Becherkörpers (12) aufgedruckt ist, wobei die Seitenwand (14) aus einem Papierblatt mit einem Grundgewicht innerhalb eines Bereiches zwischen 170 g/m^2 und 310 g/m^2 und einer Dicke innerhalb eines Bereiches zwischen 220 µm und 420 µm ausgebildet ist, wobei das Papierblatt der Seitenwand (14) eine Helligkeit nach dem Munsellsystem Bw einer Farbe innerhalb eines Bereiches zwischen 6 und 10 hat, wobei die Markierung (52) eine Helligkeit nach dem Munsellsystem Bm einer Farbe innerhalb eines Bereiches zwischen 0 und 7 hat und die Beziehung $Bw - Bm \geq 3$ erfüllt ist.

28. Wärmeisolierter Becher gemäß Anspruch 13,
dadurch gekennzeichnet, daß
eine Markierung (52) als ein Kriterium zum Eingießen von Flüssigkeit in den Becher (10) an einer Außenfläche der Seitenwand (14) des Becherkörpers (12) aufgedruckt ist, wobei ein offenes Fenster (54) in der Schutzabdeckung (20) zum Freilegen von zumindest einem Teil der Markierung (52) ausgebildet ist, wobei die Seitenwand (14) aus einem Papierblatt mit einem Grundgewicht innerhalb eines Bereiches zwischen 170 g/m^2 und 310 g/m^2 und einer Dicke innerhalb eines Bereiches zwischen 220 µm und 420 µm ausgebildet ist, wobei das Papierblatt der Seitenwand (14) eine Helligkeit nach dem Munsellsystem Bw einer Farbe innerhalb eines Bereiches zwischen 6 und 10 hat, wobei die Markierung (52) eine Helligkeit nach dem Munsellsystem Bm einer Farbe innerhalb eines Bereiches zwischen 0 und 8 hat und die Beziehung $Bw - Bm \geq 2$ erfüllt ist.

29. Wärmeisolierter Becher gemäß Anspruch 13,

dadurch gekennzeichnet, daß
ein offenes Fenster (56), das als eine Markierung wirkt, als ein Kriterium für das Eingießen von Flüssigkeit in den Becher (10) in der Schutzabdeckung (20) ausgebildet ist und die Seitenwand (14) aus einem Papierblatt mit einem Grundgewicht innerhalb eines Bereiches zwischen 170 g/m^2 und 310 g/m^2 und einer Dicke innerhalb eines Bereiches zwischen 220 µm und 420 µm ausgebildet ist.

30. Wärmeisolierter Becher gemäß Anspruch 13,
dadurch gekennzeichnet, daß
eine ringförmige geprägte Linie (19), die als eine Markierung wirkt, als ein Kriterium zum Eingießen von Flüssigkeit in den Becher (10) an der Seitenwand (14) ausgebildet ist.

Revendications

1. Procédé de fabrication d'un gobelet thermiquement isolant (10) constitué d'un corps (12) de gobelet ayant une paroi latérale (14) de papier et une paroi de fond (16) de papier, et d'un organe protecteur de couverture (20) formé de papier et fixé afin gu'il recouvre la paroi latérale du corps de gobelet, l'organe protecteur de couverture (20) comprenant une feuille de papier gaufré (24), le procédé étant caractérisé par les étapes suivantes :

le collage d'une première feuille initiale de la feuille de papier gaufré (24) et d'une seconde feuille initiale d'une feuille de revêtement (28) l'une à l'autre avec un premier adhésif,
la découpe par poinçonnage de la structure collée de la première et de la seconde feuille initiale pour la préparation d'un flan (32) à la foie de l'organe protecteur de couverture (20),
l'application d'un second adhésif au flan (32), et
l'enroulement du flan (32) afin que la feuille de revêtement (28) soit disposée à l'extérieur, et
le collage du flan enroulé (32) comme organe protecteur de couverture (20) à la paroi latérale (14) du corps (12) de gobelet.

2. Procédé selon la revendication 1, caractérisé en ce que :

l'étape de collage du flan enroulé (32) à la paroi latérale (14) du corps de gobelet (12) comprend les étapes auxiliaires suivantes :
l'application du second adhésif au flan (32), et
le collage du flan (32) à la paroi latérale (14) avec le second adhésif, avec enroulement du flan autour de la paroi latérale.

3. Procédé selon la revendication 2, caractérisé en ce que les deux parties d'extrémité latérale (33a, 33b) du flan (32) sont disposées afin qu'elles soient opposées lors du collage du flan à la paroi latérale (14).

4. Procédé selon la revendication 1, caractérisé en ce que l'étape de collage du flan enroulé (32) à la paroi latérale (14) du corps (12) de gobelet comprend les étapes secondaires suivantes :

l'assemblage du flan (32) sous forme d'un cône dont la forme interne correspond à la forme externe du corps de gobelet, et
le collage du cône à la paroi latérale (14) lors de son ajustement sur la paroi latérale (14) du corps (12) de gobelet.

5. Procédé selon la revendication 1, caractérisé en ce que l'étape de collage de la première feuille initiale à la seconde feuille initiale comprend les étapes secondaires suivantes :

la préparation de la première feuille initiale par application d'un traitement de gaufrage (116) à une feuille provenant d'un premier rouleau (108),
l'application du premier adhésif à la première feuille initiale en même temps que le traitement de gaufrage ou après ce traitement, et
le collage de la seconde feuille initiale de la feuille de revêtement (28), provenant d'un second rouleau (112), en synchronisme avec la séparation de la feuille du premier rouleau (108), sur la première feuille initiale ayant le premier adhésif.

6. Procédé selon la revendication 1, caractérisé en ce qu'il comprend les étapes suivantes :

le pliage vers l'extérieur d'une région d'extrémité circonférentielle supérieure ouverte de la paroi latérale (14) du corps (12) de gobelet, afin que la partie pliée forme au moins un tour complet et constitue une partie enroulée (42),

l'application d'une pression à la partie enroulée (42) en direction verticale afin que cette partie enroulée s'affaisse en s'aplatissant et forme ainsi une partie de flasque (18) ayant un plateau supérieur (44) et un plateau inférieur (46) qui sont collés l'un à l'autre dans la partie de flasque, et

le collage de l'organe protecteur de couverture (20) à la paroi latérale (14) juste après l'étape d'application d'une pression à la partie enroulée (42) afin que la partie de flasque se déforme sous l'action de sa propre force de rétablissement et réduise ainsi la distance comprise entre le plateau inférieur (46) de la partie de flasque (18) et une extrémité supérieure (20a) de l'organe protecteur de couverture (20).

7. Procédé selon la revendication 6, caractérisé en ce qu'il comprend en outre une étape d'autorisation de la mise en butée de la surface inférieure du plateau inférieur (46) de la partie de flasque (18) avec la partie d'extrémité supérieure (20a) de l'organe protecteur de couverture (20) afin que la partie de flasque ne puisse pas subir une déformation supplémentaire sous l'action de sa propre force de rétablissement.

8. Procédé selon la revendication 1, caractérisé en ce que le second adhésif comprend une première partie appliquée avec une pression à deux premières régions (34) en forme de bandes réalisées dans des régions d'extrémité latérale du flan (32) de l'organe protecteur de couverture (20) et une seconde partie appliquée sans pression à au moins une seconde région (35) disposée sur le flan en dehors des deux premières régions.

9. Procédé selon la revendication 8, caractérisé en ce que le second adhésif comprend en outre une troisième partie appliquée avec la première partie avec une pression sur une région (34) en forme de bande le long de l'axe central du flan (32) de l'organe protecteur de couverture (20).

10. Procédé selon la revendication 1, caractérisé en ce que le second adhésif comprend une première partie appliquée avec une pression à deux premières régions (34) en forme de bandes disposées dans les régions d'extrémité latérale du flan (32) de l'organe protecteur de couverture (20) et une seconde partie appliquée sans pression à au moins une seconde région disposée sur la paroi latérale (14).

11. Procédé selon la revendication 10, caractérisé en ce que le second adhésif comporte en outre une troisième partie appliquée le long de la première partie avec une pression sur une région (34) en forme de bande le long d'un axe central du flan (32) de l'organe protecteur de couverture (20).

12. Procédé selon la revendication 1, caractérisé en ce que l'organe protecteur de couverture comporte en outre une feuille mince de papier (22, 26) disposée à une face au moins de la feuille de papier gaufré (24) et ayant une masse surfacique comprise entre 20 et 100 g/m^2, et le procédé comprend en outre les étapes suivantes :

le collage d'une troisième feuille initiale d'une feuille mince de papier (22, 26) à la première feuille initiale de papier gaufré (24),

le collage de la seconde feuille initiale de revêtement (28) à l'une des première et troisième feuilles initiales pour la préparation d'une feuille stratifiée constituée des première, seconde et troisième feuilles initiales, et

la découpe par poinçonnage de la feuille stratifiée pour la préparation du flan (32) de l'organe protecteur de couverture (20).

13. Gobelet thermiquement isolant, comprenant :

un corps (12) de gobelet ayant une paroi latérale (14) de papier et une paroi (16) de fond de papier, et

un organe protecteur de couverture (20) de papier gaufré fixé afin qu'il recouvre la paroi latérale du corps de gobelet,

caractérisé en ce que l'organe protecteur de couverture (20) est préparé par enroulement d'un flan (32) d'une structure multicouche comprenant la feuille de papier gaufré (24) et une feuille de revêtement de papier (28) collée à la feuille de papier gaufré, le flan (32) étant enroulé afin que la feuille de revêtement (28) soit disposée à l'extérieur, et par collage du flan (32) au corps de gobelet.

14. Gobelet thermiquement isolant selon la revendication 13, caractérisé en ce que la feuille de papier gaufré (24) a une masse surfacique comprise entre 50 et 180 g/m^2, et la feuille de revêtement (28) a une masse surfacique comprise entre 180 et 270 g/m^2.

15. Gobelet thermiquement isolant selon la revendication 13, caractérisé en ce que le flan (32) de l'organe protecteur de couverture (20) est collé à la paroi latérale (14) du corps (12) de gobelet de manière que les deux parties d'extrémité latérale (33a, 33b) du flan soient opposées l'une à l'autre.

16. Gobelet thermiquement isolant selon la revendication 13, caractérisé en ce qu'une surface interne de la paroi latérale (14) est recouverte d'une feuille (13) de matière plastique ayant une épaisseur de 20 à 60 μm, et un traitement de matage (13a) est appliqué à la surface de la couche de matière plastique pour permettre à celle-ci d'avoir une rugosité moyenne en dix points comprise entre 10 et 30 μm, ne dépassant pas 60 % de l'épaisseur de la couche de matière plastique.

17. Gobelet thermiquement isolant selon la revendication 16, caractérisé en ce qu'une surface externe de la feuille de revêtement (28) est couverte d'une couche de vernis (30).

18. Gobelet thermiquement isolant selon la revendication 13, caractérisé en ce qu'un gaufrage de surface (48) est formé à la surface externe de la feuille de revêtement (28) pour former un dessin en saillie et en creux, les éléments du dessin en saillie et en creux ayant une largeur moyenne comprise entre 500 et 1 500 μm, et le gaufrage de surface (48) ayant une rugosité moyenne en dix points comprise entre 40 et 100 μm.

19. Gobelet thermiquement isolant selon la revendication 13, caractérisé en ce qu'il comporte en outre une partie de flasque (18) préparée par pliage vers l'extérieur d'une région d'extrémité circonférentielle supérieure ouverte de la paroi latérale (14) du corps (12) du gobelet afin que la partie pliée forme au moins un tour complet, le pliage étant suivi de l'application d'une pression en direction verticale sur la partie pliée, celle-ci ne pouvant pas coller à elle-même à l'intérieur, une position de la partie d'extrémité supérieure (20a) de l'organe protecteur de couverture (20) et un matériau de la paroi latérale (14) étant sélectionnés afin qu'un espace apparaissant le long de la surface externe de l'organe protecteur de couverture entre l'organe protecteur de couverture (20) et la partie de flasque (18) ait une largeur réduite à une valeur inférieure ou égale à 0,5 mm par la déformation de la partie de flasque provoquée par sa propre force de rétablissement.

20. Gobelet thermiquement isolant selon la revendication 19, caractérisé en ce qu'une surface inférieure de la partie de flasque (18) est en butée contre la partie d'extrémité supérieure (20a) de l'organe protecteur de couverture (20) afin que la partie de flasque ne puisse pas subir une déformation supplémentaire sous l'action de sa propre force de rétablissement.

21. Gobelet thermiquement isolant selon la revendication 13, caractérisé en ce que l'organe protecteur de couverture (20) est collé à la paroi latérale par un adhésif qui comprend une première partie appliquée avec une pression à deux premières régions (34) en forme de bandes réalisées dans les régions d'extrémité latérales du flan (32) de l'organe protecteur de couverture (20), et une seconde partie appliquée sans pression à au moins une seconde région (35) disposée entre les deux premières régions.

22. Gobelet thermiquement isolant selon la revendication 21, caractérisé en ce que l'adhésif comporte en outre une troisième partie appliquée avec la première partie avec une pression dans une région (34) en forme de bande disposée le long d'un axe central du flan (32) de l'organe protecteur de couverture (20).

23. Gobelet thermiquement isolant selon la revendication 13, caractérisé en ce que l'organe protecteur de couverture (20) comporte en outre une feuille mince de papier (22, 26) placée à au moins une surface de la feuille de papier gaufré (24) et ayant une masse surfacique comprise entre 20 et 100 g/m^2.

24. Gobelet thermiquement isolant selon la revendication 23, caractérisé en ce que la feuille mince de papier (22, 26) est placée entre la paroi latérale (14) et la feuille de papier gaufré (24).

25. Gobelet thermiquement isolant selon la revendication 13, caractérisé en ce que l'organe protecteur de couverture (20) comporte en outre une perforation (37) destinée à faciliter l'opération d'enroulement.

26. Gobelet thermiquement isolant selon la revendication 25, caractérisé en ce que l'organe protecteur de couverture (20) comporte en outre des découpes (38) formées aux extrémités supérieure et inférieure de la perforation (37).

27. Gobelet thermiquement isolant selon la revendication 13, caractérisé en ce qu'une marque (52) constituant une référence pour le versement d'un liquide dans le gobelet (10) est imprimée à une surface externe de la paroi laté-

rale (14) du corps (12) du gobelet, la paroi latérale (14) est formée d'une feuille de papier ayant une masse surfacique comprise entre 170 et 310 g/m^2 et une épaisseur comprise entre 220 et 420 µm, la feuille de papier de la paroi latérale (14) a une luminosité du système Munsell Bw d'une couleur comprise dans la plage allant de 6 à 10, la marque (52) a une luminosité du système Munsell Bm d'une couleur comprise entre 0 et 7, et la relation $Bw - Bm \geq 3$ est respectée.

28. Gobelet thermiquement isolant selon la revendication 13, caractérisé en ce qu'une marque (52) formant une référence pour le versement de liquide dans le gobelet (10) est imprimée sur une surface externe de la paroi latérale (14) du corps (12) de gobelet, une fenêtre ouverte (54) est formée dans l'organe protecteur de couverture (20) pour l'exposition au moins partielle de la marque (52), la paroi latérale (14) est formée d'une feuille de papier ayant une masse surfacique comprise entre 170 et 310 g/m^2 et une épaisseur comprise entre 220 et 420 µm, la feuille de papier de la paroi latérale (14) a une luminosité du système Munsell Bw d'une couleur comprise entre 6 et 10, la marque (52) a une luminosité du système Munsell Bm d'une couleur comprise entre 0 et 8, et la relation $Bw - Bm \geq 2$ est respectée.

29. Gobelet thermiquement isolant selon la revendication 13, caractérisé en ce qu'une fenêtre ouverte (56) jouant le rôle d'une marque de référence de versement d'un liquide dans le gobelet (10) est formée dans l'organe protecteur de couverture (20), et la paroi latérale (14) est formée d'une feuille de papier ayant une masse surfacique comprise entre 170 et 310 g/m^2 et une épaisseur comprise entre 220 et 420 µm.

30. Gobelet thermiquement isolant selon la revendication 13, caractérisé en ce qu'une ligne annulaire gaufrée (19) jouant le rôle d'une marque de référence de versement de liquide dans le gobelet (10) est formée sur la paroi latérale (14).

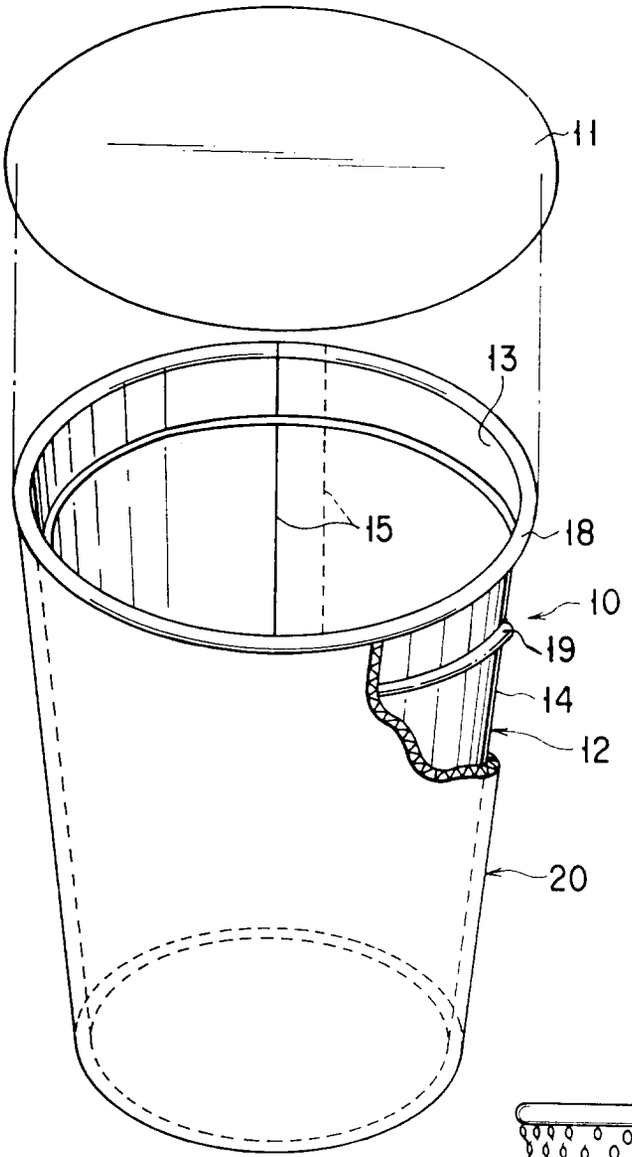

FIG. 1

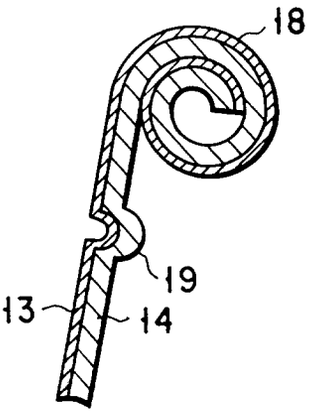

FIG. 3

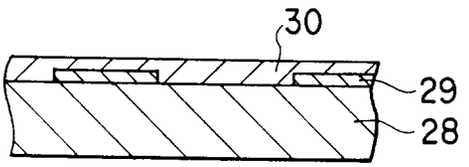

FIG. 4

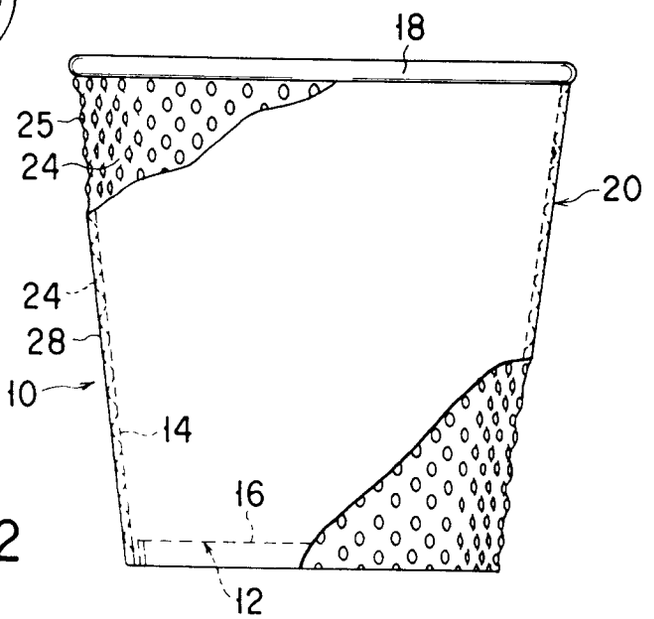

FIG. 2

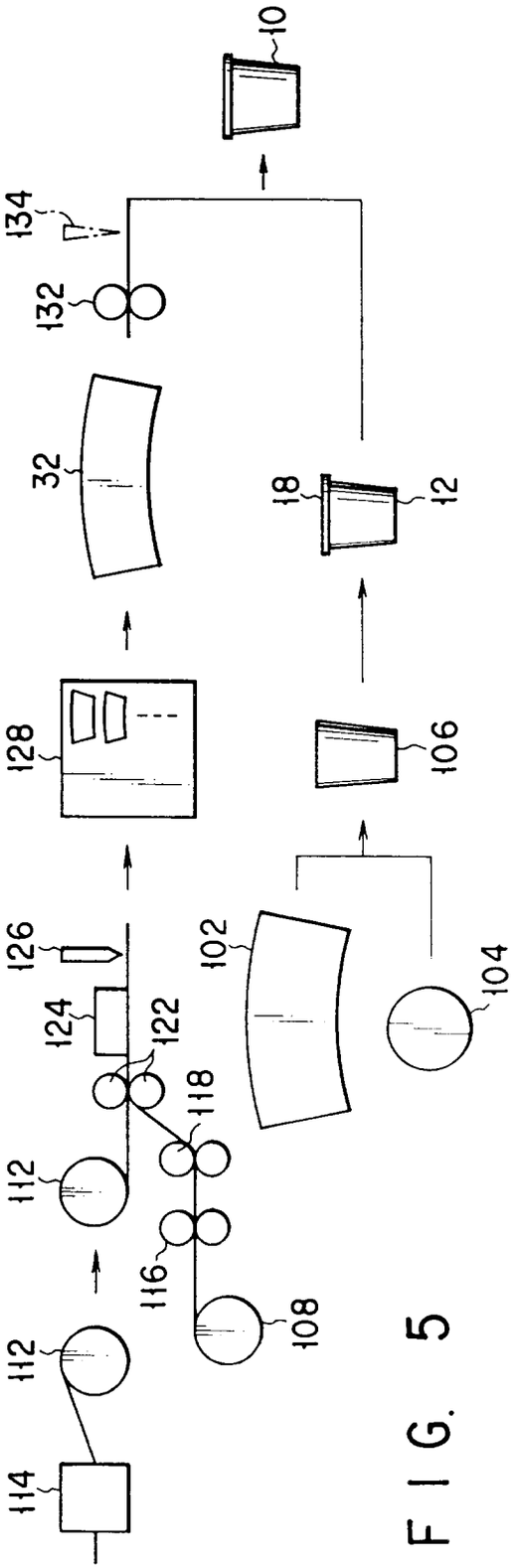
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FIG. 5

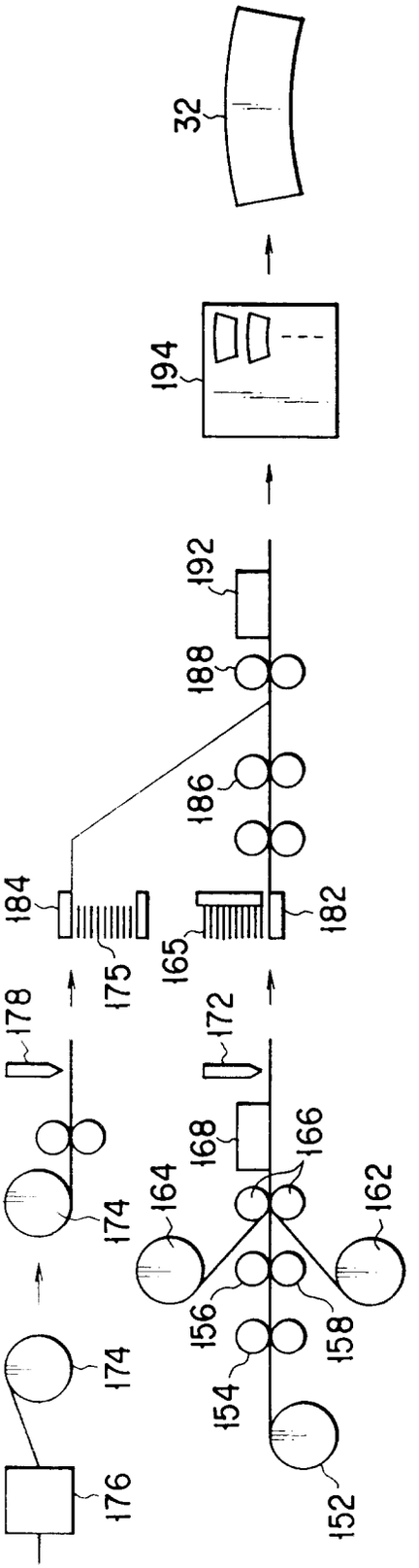
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FIG. 18

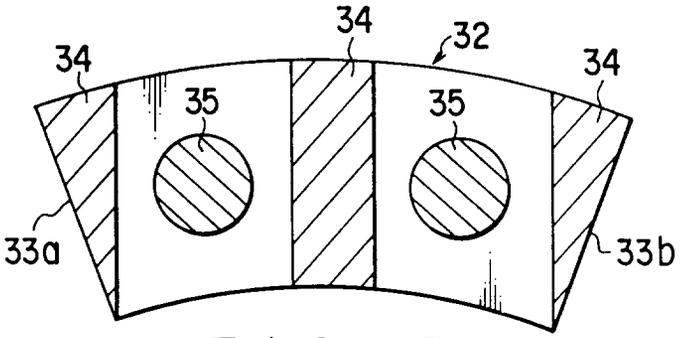

FIG. 6

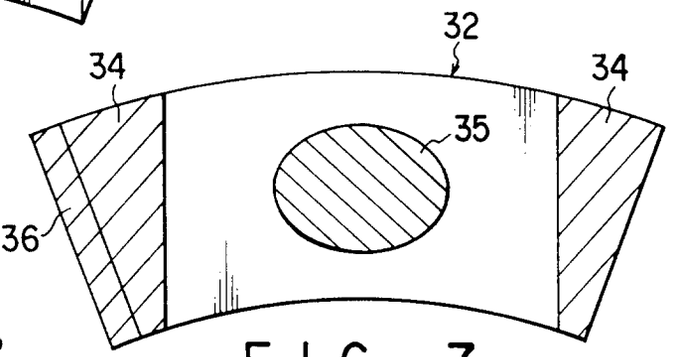

FIG. 7

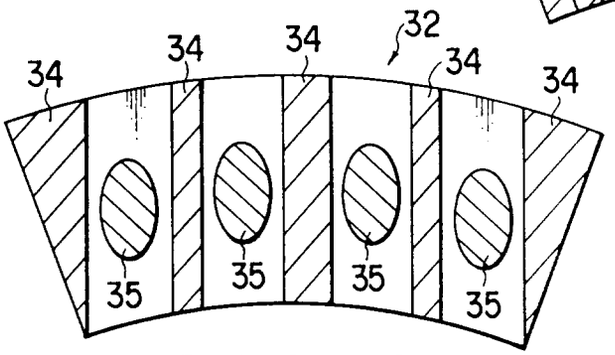

FIG. 8

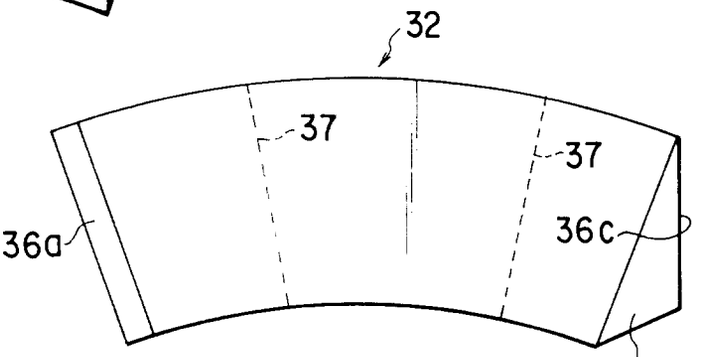

FIG. 9

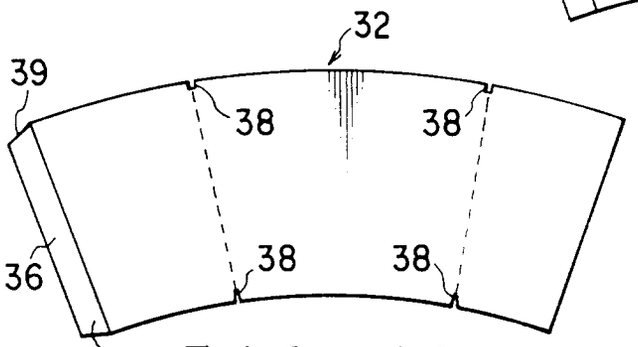

FIG. 10

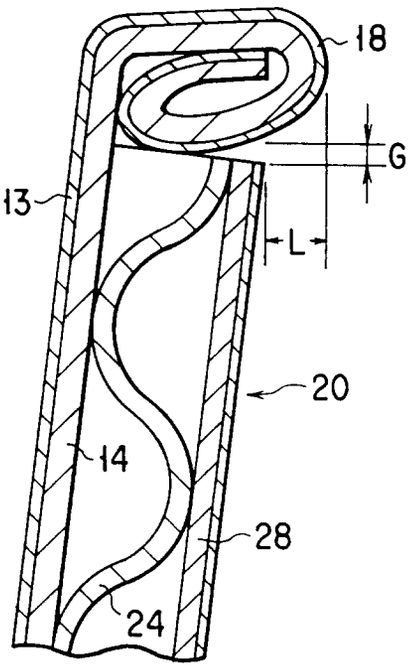

FIG. 11

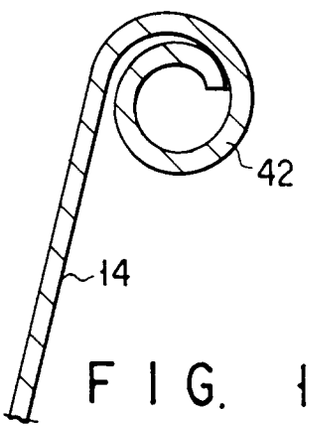

FIG. 12A

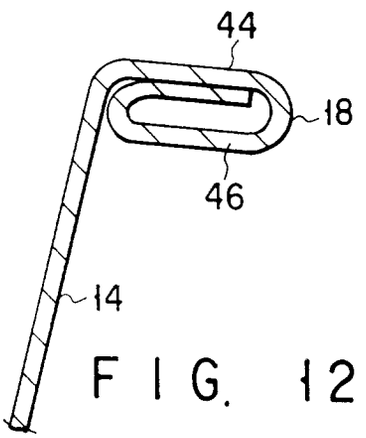

FIG. 12B

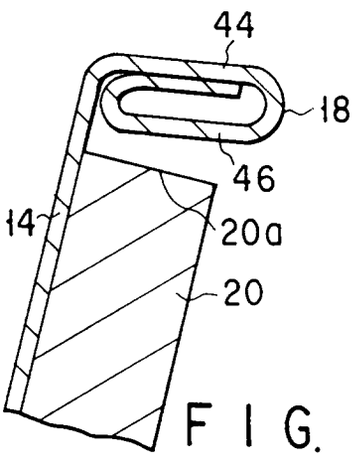

FIG. 12C

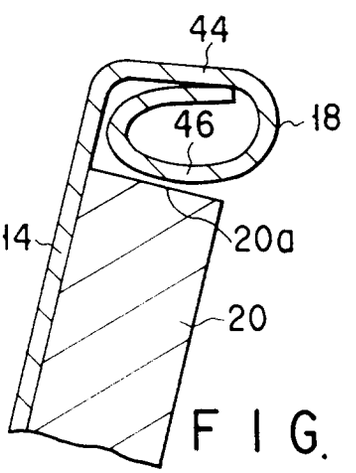

FIG. 12D

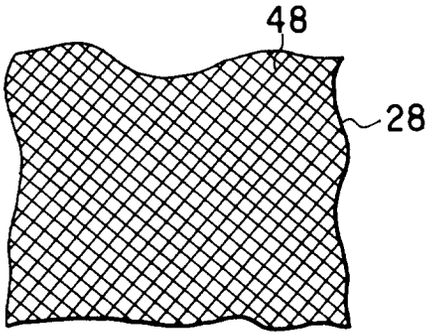

FIG. 13

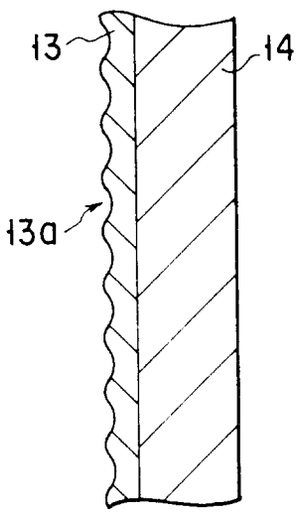

FIG. 14

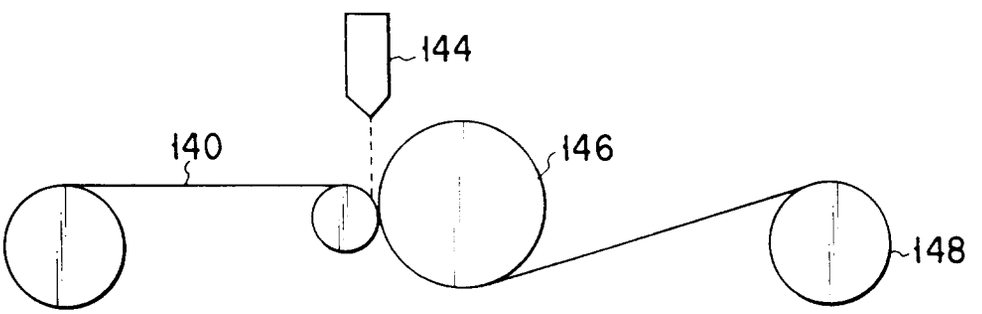

FIG. 15

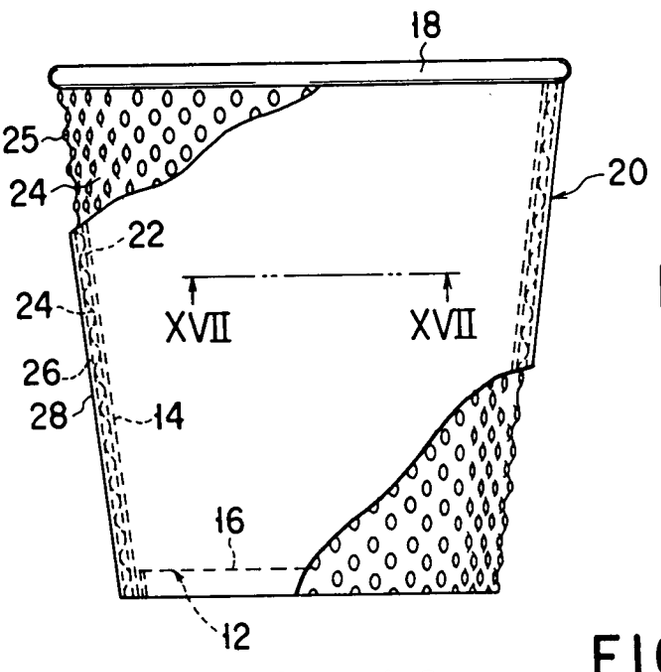

FIG. 16

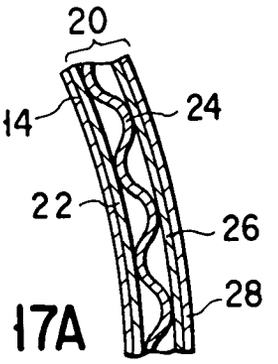

FIG. 17A

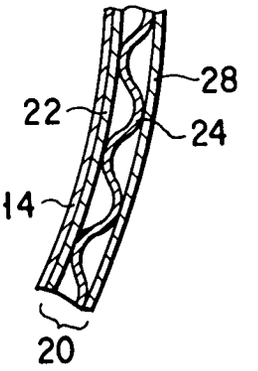

FIG. 17B

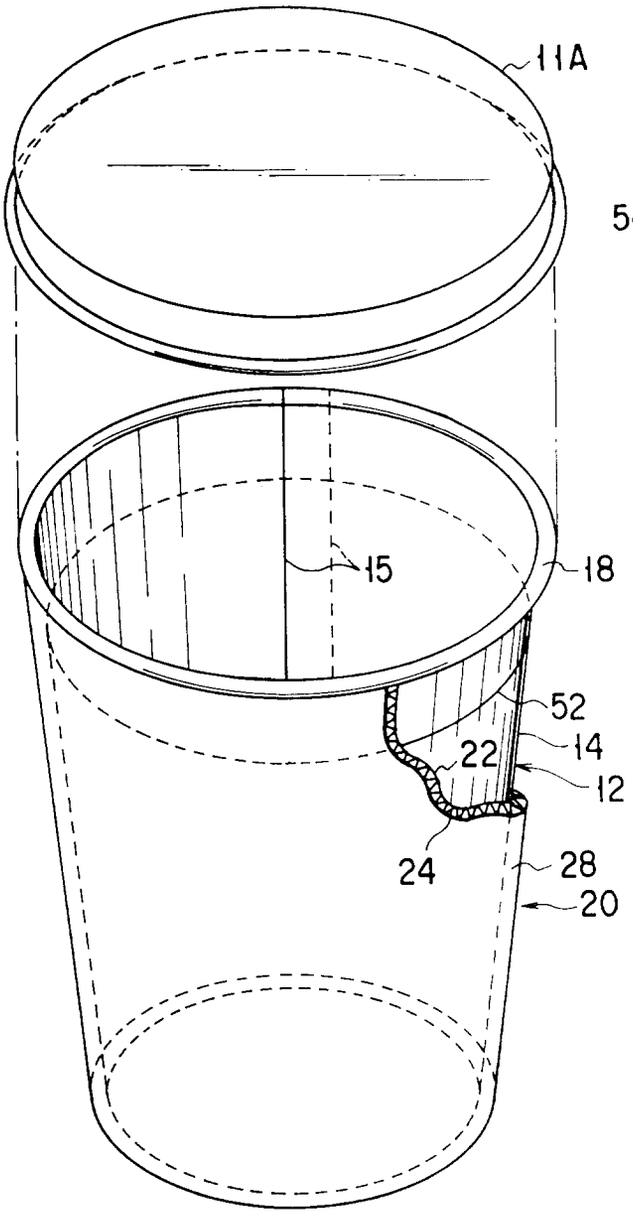

FIG. 19

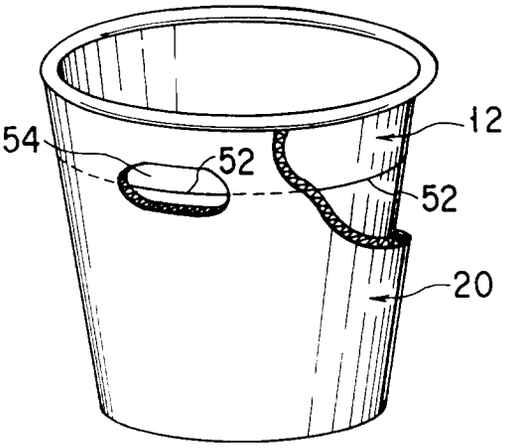

FIG. 20

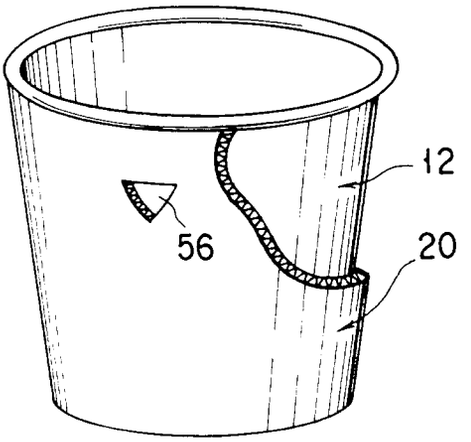

FIG. 21