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(54) FOLDABLE TUMBLER FOR WRITING ITEMS

(57) A foldable tumbler for writing articles, said foldable tumbler having a top surface (1), an opening (5), a bottom surface (3), a panel (2) being movable during the assembly and disassembly and being connected to said surfaces (1) and (3) through folding lines (21, 22), said top and bottom surfaces (1, 3) being as well connected in a hinged connection to an inner reinforcing wall connected to surrounding outer side walls (6), said surfaces (1, 3), movable panel (2) and reinforcing wall forming a foldable, hinged quadrilateral. The tumbler is obtained from one only piece of printable sheet being die-cut, indented, bent and glued in a fully automated process, wherein all of the graphic information carrying surfaces being visible belong to one and the same face of said printable sheet piece, and a developed surface (101, 102, 104) of said tumbler comprises a first strip formed by the panels making up said hinged quadrilateral, said panels being connected to each other through mutually parallel folding lines, and a second strip perpendicularly deriving from one side of said first strip and being formed by a plurality of side wall panels (6) being connected to each other through folding lines (61).

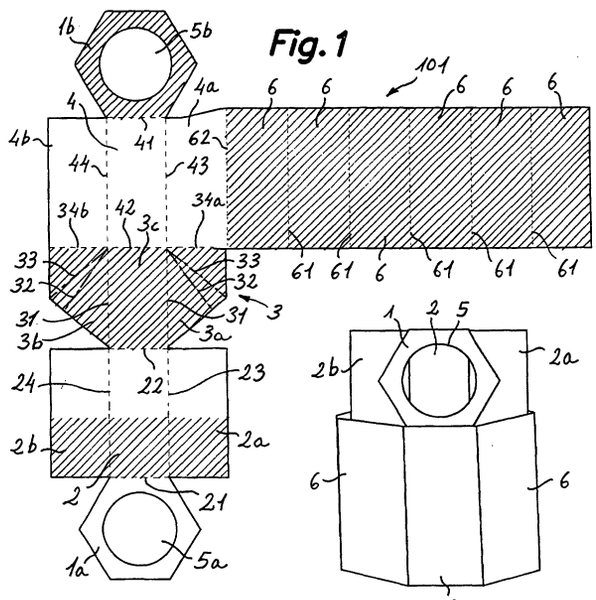

Fig.1

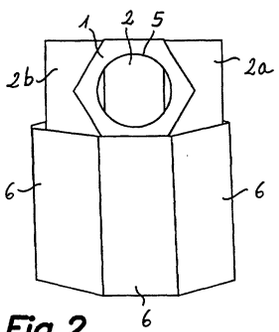

Fig.2

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Description

Field of the Invention

[0001] The present invention concerns a foldable tumbler for writing articles, said foldable tumbler being of the type being made of sheet material and comprising a top surface with an opening, a bottom surface and surrounding outer side walls, said top and bottom surfaces being connected to each other through a movable panel thus forming a foldable, hinged quadrilateral, in such a way that said tumbler is apt to be arranged in a packed, planar arrangement being apt for its storage and transportation, in said packed, planar arrangement all of the panels, surfaces and walls being fully or partially superimposed in a substantially coplanar arrangement, and in an assembled arrangement being apt for its use, in said assembled arrangement said top and bottom surfaces being parallel to each other, said movable panel acting by way of an inner reinforcing wall.

Technical Background

[0002] From Utility Model ES-A-295474U of the prior art a foldable tumbler of this type is already known which is called "an advertising device" wherein said hinged quadrilateral is formed by a hexagonal top surface, a rectangular movable panel, a hexagonal bottom surface and laps being apt to be fitted to each other at their ends in order to thus form a rectangle similar to that of the movable panel, said laps respectively deriving from sides of the top and bottom surfaces being opposite to the sides forming the connection to the movable panel. All of these members form a developed surface being comprised of a cardboard of a substantial thickness being necessary to endow the tumbler assembly with rigidity, and are obtained from a thin sheet being generally printed in those areas that will be visible once the tumbler has been assembled, said sheet being superimposed and glued on a thick carrier sheet and being later on die-cut. The side walls are formed by a strip of six rectangular side panels whose width is equivalent to the side of the hexagon, said panels being mutually connected through folding lines situated at opposite sides, said strip being properly bent in such a way that the panel situated at one end of the strip is finally superimposed and glued on an extension of the panel of the other end. Said strip is obtained from a relatively thin sheet being printed on the face that will face the outside once having been assembled. The developed surface comprising the members forming said quadrilateral is properly folded in such a way that said laps are then fitted to each other thus forming said rectangle, this latter being then superimposed and glued on the inner face of one of the intermediary side panels, this being generally done in a manual operation requiring a certain accuracy. Later on the side panel strip is closed by means of gluing the last panel on an extension of the first one as has been previously said.

[0003] As is apparent, this known tumbler is formed by three members or structures made of materials of different thicknesses and assembled by means of manual operations of a certain accuracy, one of said materials (thick cardboard) because of its substantial thickness not being apt to be directly printed, the printing having to be carried out on a thin material that later on is superimposed and glued on a thick carrier material, whereas the other material is directly printed in a separate operation. All this involves a substantial time and money expenditure.

[0004] From Utility Model ES-A-1027684 a foldable advertising display is also known which once assembled forms two warped side walls being convex towards the outside and has an ogival cross-section. Said model is obtained from one only piece of printable sheet which is die-cut, bent and glued and includes appendages being innerly situated to thus aid the walls to maintain the desired warped shape. Nevertheless, the obtained object does not constitute a true tumbler, i.e. a receptacle with an open top surface and with a bottom closing the whole inside perimeter thus being apt to contain objects (and sufficiently strong for such a purpose) such as writing articles, said object being only useful as a graphic information carrier being apt to carry the graphic information on the outer faces of its side walls.

[0005] Utility Model ES-1044717 discloses a cardboard wastepaper basket of prismatic shape with a hexagonal base and being formed from one only sheet body wherein in a die-cutting operation cutting and folding lines are defined which determine a developed surface with a first base member of hexagonal shape from one of whose sides a second rectangular member derives corresponding to the side walls divided by folding lines. Each free side of the hexagon has a projecting tab, and each side wall has a slot in its lower region. In the assembled condition of said wastepaper basket each of said tabs is inserted in one of said corresponding slots, and a tab being an extension of the end of the final side wall is inserted in a slot situated in the first edge of the side walls. This model is obtained from one only sheet piece and is assemblable and disassemblable. Nevertheless, in the disassembled state said wastepaper basket occupies the whole extension of its developed surface, and the assembly and disassembly operations are complicated and must be carried out manually in their entirety. On the other hand, in the assembled state the bottom member is at a distance from the floor and rests on it in a not very secure way only through said tabs inserted in the slots of the side walls, said tabs undesirably projecting from said slots towards the outside. On the other hand, for the sheet member to be printable it has to be thin thus causing the assembled object to be frail.

Object of the Invention

[0006] The object of the present invention is therefore to provide a foldable tumbler for writing articles, said tumbler being made of sheet material and being apt to be arranged in a packed, planar arrangement being apt for its storage and transportation, in said packed, planar arrangement all of the elements forming said tumbler being fully or partially superimposed in a substantially coplanar arrangement, and in an assembled arrangement being apt for its use, in said assembled arrangement the top and bottom surfaces being parallel to each other, said tumbler being obtained from one only piece of printable sheet of uniform thickness being apt to be die-cut, indented, bent and glued in a fully automated process, wherein all of the surfaces being useful to carry graphic information and being visible both in said packed, planar arrangement and in said assembled arrangement belong to one and the same face of said printable sheet piece, the configuration of said tumbler being such that in said assembled arrangement it is rigid enough to preserve its shape in a stable manner even when being pressed with the fingers.

Summary of the Invention

[0007] The prediscussed object is attained as per the invention by providing a tumbler that is obtained from a developed surface of one only piece of a printable sheet material of uniform thickness. Said developed surface incorporates a first top surface panel with a first opening, a movable panel, a bottom panel, a stationary panel and a second top surface panel with a second opening, all of these panels in the above-mentioned order forming a first strip and being connected to each other through folding lines. From a side of said stationary panel and through a folding line derive a plurality of side wall panels in their turn forming a second strip extending in a direction being perpendicular to the first one, said side wall panels being connected to each other through folding lines. Said developed surface is apt to be folded in such a way that said first and second top surface panels deriving from opposite areas of the die-cut developed surface are superimposed in such a way that their mutually contacting faces are the opposite faces of the printable sheet piece and said first and second openings are in register, said first and second top surface panels being then glued to each other thus forming said open top surface being comprised of a double layer of material having a thickness being adequate for the required rigidity. Said side panel strip is also properly folded, and the side wall panel situated at the free end of said strip is superimposed on said stationary panel and glued on at least one area of this latter. In this way, at least one side wall formed by a side wall panel superimposed on said stationary panel has a double thickness thus enhancing the general rigidity. In the assembled arrangement the movable panel is on the other hand always innerly superimposed, although not glued, on a side wall panel, this also contributing to enhance the rigidity. In the proposed exemplary embodiments being set forth below the movable and/or stationary panels have extensions causing all of the side walls to be in their entirety or in a big area of theirs formed by a double layer. A special configuration of the bottom panel and/or of the elements connecting it to the stationary panel does besides cause said bottom panel to acquire when the tumbler is in the assembled arrangement a tridimensional configuration giving much rigidity to the assembly. The tumbler of the present invention is on the other hand apt to be arranged in a packed, folded arrangement wherein all of its panels are fully or partially superimposed in a substantially coplanar arrangement.

[0008] The term "stationary panel" is used in this description to refer to a panel forming part of said hinged quadrilateral and remaining stationary when the tumbler is held by its side walls either in the assembled or in the folded arrangement or in the transitions between both, whereas the term "movable panel" is used to refer to a panel belonging to said hinged quadrilateral and adopting different positions depending on whether the tumbler is in the assembled or in the folded arrangement, and tracing a trajectory when accompanying the pertinent positioning of the top and bottom surfaces in the transitions between both arrangements.

Description of the Drawings

[0009] Exemplary embodiments of the invention will be more deeply described below with reference to the accompanying drawings wherein:

Fig. 1 is a view of the planar developed surface of a foldable tumbler as per the invention having a cross-section in the shape of a regular hexagon;

Figs. 2 and 3 are perspective views illustrating the tumbler having been obtained from the developed surface of Fig. 1 in a planar, folded arrangement and in an assembled arrangement, respectively;

Fig. 4 is a bottom perspective view illustrating the bottom area of the assembled tumbler of Fig. 3, said bottom area as can be seen being flush with the supporting surface;

Fig. 5 is a partial view of the planar developed surface of a variation of a foldable tumbler as per the present invention having a cross-section in the shape of a regular hexagon, with additional reinforcing tabs having been added to the top surface;

Fig. 6 is a perspective view of the tumbler having been obtained from the developed surface of Fig. 5 in a folded arrangement;

Fig. 7 is a perspective view illustrating how the folded tumbler of Fig. 6 is being assembled in the course of an assembly operation;

Fig. 8 is a view of the planar developed surface of another variation of the foldable tumbler as per the

present invention having a cross-section in the shape of a regular hexagon, with a bottom panel situated at a distance from the supporting plane;

Fig. 9 is a bottom perspective view illustrating the bottom area of the tumbler of Fig. 8;

Fig. 10 is a view of the planar developed surface of another variation of a foldable tumbler as per the present invention in this case having a cross-section of ojival shape;

Figs. 11 and 12 are perspective views illustrating the tumbler having been obtained from the developed surface of Fig. 10 in a folded and assembled arrangement, respectively; and

Fig. 13 is a bottom perspective view illustrating the bottom area of the assembled tumbler of Fig. 12.

Detailed Description of the Preferred Exemplary Embodiment

[0010] Firstly referring to Fig. 1 this latter shows a developed surface 101 forming one only piece having been die-cut from a printable sheet of uniform thickness typically being a paperboard with a grammage ranging from 250 to 350 g/m^2. In said developed surface 101 a first top surface panel 1a with a first opening 5a is connected through a folding line 21 to a movable panel 2 (this latter panel being movable during the assembly and disassembly operations) being connected through a folding line 22 situated at an opposite side to a bottom surface panel 3 being in its turn connected through a folding line 42 situated at an opposite side to a stationary panel 4 being connected through a folding line 41 situated at an opposite side to a second top surface panel 1b provided with an opening 5b, said panels thus forming a strip. In this exemplary embodiment said first and second top surface panels 1a, 1b which as will be explained further below will form a top surface 1 of the tumbler are identical and have the shape of a regular hexagon, and said movable and stationary panels 2, 4 are in their turn as well of the same rectangular shape, with a width being substantially equal to the side of said regular hexagon, and of a predetermined height.

[0011] By conveniently folding this strip along said mutually parallel folding lines 21, 22, 41, 42 the second top surface panel 1b is superimposed on the first top surface panel 1a with the first and second openings 5a and 5b in register, said panels being thus superimposed and glued on one another in such a way that their mutually contacting faces are the opposite faces of said printable sheet, said panels thus forming said top surface 1 of the tumbler (Figs. 2 and 3). With this first stage of the assembly a quadrilateral is formed which is hinged along said folding lines 21, 22, 41, 42, and in which the top surface 1 is always parallel to the bottom surface 3 and the movable panel 2 is always parallel to the stationary panel 4, said quadrilateral being apt to adopt an endless number of positions, with a position wherein the movable and stationary panels 2, 4 form right angles with the top and bottom surfaces 1, 3, and at least a folded, planar and packed position wherein all of the panels and surfaces adopt a fully or partially superimposed and substantially coplanar position. It is to be pointed out that the folded assembly having been arranged in said "planar" arrangement is apt to be printed in a printing step carried out on a portion of one of the panels having been left blank in order to later on be in a position to personalize the tumbler.

[0012] Again referring to Fig. 1 the developed surface 101 does besides comprise lateral extensions 2a, 2b of the movable panel 2 being connected to this latter through respective folding lines 23, 24, and lateral extensions 4a, 4b of the stationary panel 4 being connected to this latter through respective folding lines 43, 44, the width of said lateral extensions 2a, 2b, 4a, 4b being substantially equal to that of the movable and stationary panels 2, 4 and hence to the length of the side of the hexagon. From one of said lateral extensions 4a of the stationary panel 4 and through a folding line 62 derive six side wall panels 6 being connected to each other through folding lines 61 and forming a lateral strip. Said side wall panels 6 are rectangular and have a width being substantially equal to the side of the hexagon and a height being equal to or bigger than the height of the movable and stationary panels 2, 4, said side wall panels being arranged in such a way that the top edges of the side wall panels 6 are parallel to said folding line 41 and slightly offset above this latter whereas the bottom edges of the side wall panels 6 are substantially aligned with the folding line 42 thus facilitating the automated folding (free motion of the folding blades).

[0013] The side wall panels 6 are properly folded along the folding lines 61 thus surrounding said hinged quadrilateral having been previously formed, in such a way that the three side wall panels 6 being situated at the free end of the strip are then superimposed on the stationary panel 4 and on its lateral extensions 4a, 4b, at least the side wall panel 6 of the end of the strip being glued on at least one area of the lateral extension 4a.

[0014] With this operation the assembly of said tumbler is completed, this latter being apt to be arranged in a packed, planar arrangement (Fig. 2) being apt for its storage and transportation, in said packed, planar arrangement all of the panels, surfaces and walls being fully or partially superimposed in a substantially coplanar arrangement, and in an assembled arrangement (Fig. 3) being apt for its use, in said assembled arrangement said top and bottom surfaces 1, 3 being perpendicular to the side walls 6. In every arrangement the top surface 1 is comprised of a double layer of material having a double thickness, as has been explained above, this giving the assembly much strength in the assembled state, and the three side walls formed by the three side wall panels 6 being superimposed and glued on the stationary panel 4 and its lateral extensions 4a, 4b do also have a double thickness, whereas the movable panel 2 and its lateral extensions 2a, 2b constitute rein-

forcing inner walls being provided to reinforce the three remaining side walls when the tumbler is in the assembled arrangement.

[0015] In the exemplary embodiment shown in Fig. 1 said bottom surface panel 3 comprises two folding lines 31 being mutually parallel and respectively aligned with said folding lines 23, 43 and 24, 44 establishing the connection between said movable and stationary panels 2, 4 and their respective lateral extensions 2a, 2b and 4a, 4b, said folding lines 31 defining in said bottom surface panel 3 a central, rectangular area 3c and two lateral areas 3a, 3b each having the shape of an isosceles triangle with the equal sides slightly longer than the length of the side of said regular hexagon of the top surface 1, in such a way that when being arranged in said assembled arrangement the bottom surface panel 3 acquires a tridimensional configuration (see Fig. 4), with said lateral areas 3a, 3b slightly bent upwards, this giving more rigidity to the assembly. The developed surface 101 of Fig. 1 allows to appreciate that each of said lateral areas 3a, 3b of the bottom panel 3 comprises an extension being connected to said lateral extensions 4a, 4b of the stationary panel 4 through folding lines 34a, 34b being aligned at both sides with the folding line 42 establishing the connection of the stationary panel 4 with the bottom surface panel 3, a folding line 34a-42-34b being thus formed as a consequence of all this. The purpose of this folding line 34a-42-34b is to assure an accurate positioning of the first top surface panel 1a when being superimposed on the second top surface panel 1b for their gluing during an automated production step. Each of said extensions of the lateral areas 3a, 3b does besides comprise oblique folding lines 32, 33 defining triangular areas that when the tumbler is arranged in said assembled arrangement form inwardly folds (see Fig. 4) giving to the bottom surface panel 3 said tridimensional configuration enhancing the rigidity of the assembly.

[0016] It is to be pointed out that the bottom edges of the side wall panels 6 are substantially aligned with the folding line 42 establishing the connection of the base panel 3 with the stationary panel 4, in such a way that said tridimensional configuration of the bottom surface 3 comprises in said assembled arrangement and as can be appreciated in Fig. 4 an area being situated at a lower level and flush with the bottom edges of said side wall panels 6 and resting on a stationary plane supporting the tumbler, whereas said movable and stationary panels 2, 4 are of a height that is smaller than that of the side wall panels 6, the top edges of the side wall panels 6 being out of alignment and offset upwards with respect to the folding line 41 establishing the connection of the stationary panel 4 with the second top surface panel 1b, in such a way that in said assembled arrangement the top surface 1 is at a lower level with respect to said top edges of the side wall panels 6.

[0017] The crosshatched areas of the developed surface 101 represent all those areas of said developed surface which are visible when this latter is arranged both in said packed, planar arrangement (Fig. 2) and in said assembled arrangement (Fig. 3), said areas as is apparent belonging to one and the same face of said printable sheet piece. These visible areas are apt to serve as a carrier for graphic information such as for example advertising, calendars, useful addresses, decorative motifs and the like being printable in one only printing operation to be carried out before the die-cutting and assembling of the developed surface 101. As has been said before, a blank area (e.g. panel 2a) can be left unprinted for an ulterior printing operation to be carried out on said area when the tumbler is arranged in a planar arrangement (Figs. 2, 6 and 11).

[0018] In addition to this, both the die-cutting operations and the assembly operations including the folding and gluing steps can be carried out automatically with the conventional apparatus of the graphic arts industrial sector.

[0019] Figs. 5 through 7 show a variation of the tumbler as per the present invention which is quite similar to the tumbler of Figs. 1 through 4 except for the appendages having been added to the top surface 1. The description of the general construction of the tumbler of Figs. 5 through 7 has been omitted since it is identical to the above description of the exemplary embodiment of Figs. 1 through 4, and the same reference numerals have been used to refer to equivalent elements. Only the different parts will be described below.

[0020] The developed surface 102 of Fig. 5 does thus differ from the developed surface 101 of Fig. 1 only in that the second top surface panel 1b, which once assembled is the visible top surface panel, comprises tabs 16, 17 being connected through respective folding lines 18, 19 to two of its sides being adjacent to its side being connected to the stationary panel 4. The top edges of the lateral extensions 4a, 4b of the stationary panel 4 are for such a purpose provided with recesses 49 allowing to provide material for said tabs 16, 17. The first top surface panel 1a, which is the one being inferiorly superimposed on the second top surface panel 1b and therefore not being visible, does not in its turn have the shape of a regular hexagon. Instead of this the two sides of said top surface panel which are adjacent to its side connected to the movable panel 4 are longer than the sides being opposite to them. These longer sides comprise tabs 11, 12 being connected to them through respective folding lines 13, 14 being secants intersecting the regular hexagon of the second top surface panel 1b. Said tabs 11, 12 have pointed ends 15. In the assembled position the tabs 11, 12, 16 and 17 are bent in an orthogonal arrangement, and the pointed ends 15 of the tabs 11, 12 are leaning against the inner face of tabs 16, 17 thus preventing them from bending towards the inside and creating a reinforcement of the top surface 1 in the transversal direction. When the tumbler is in the assembled arrangement tabs 11, 12, 16, 17 are not visible, said tumbler hence having an appearance identical to that of Figs. 3 and 4.

[0021] Fig. 7 shows the way to pass from the folded arrangement of Fig. 6 to the assembled arrangement by pressing downwards the movable panel 2 and its extensions 2a, 2b, said hinged quadrilateral formed by the movable panel 2, the stationary panel 4, the top surface 1 and the bottom panel 3 thus starting to open while the side wall panels 6 start to separate thus adopting said prismatic configuration, tabs 11, 12, 16 and 17 associated to the top surface 1 being at the same time unfolded till they become locked with each other when the tumbler has been completely assembled. In order to fold the tumbler an inverse operation is carried out by pressing the bottom panel 3 towards the inside.

[0022] Figs. 8 and 9 show a developed surface 103 of a tumbler as per the present invention having many similarities with the tumbler of Figs. 1 through 4, except as regards the configuration of the bottom area. The description of the general construction of the tumbler of Figs. 8 and 9 has been omitted since it is identical to the above description of the exemplary embodiment of Figs. 1 through 4, and the same reference numerals have been used to refer to equivalent elements. Only the different parts are hence described below.

[0023] Referring to Fig. 8, in the developed surface 103 said bottom surface panel 3 as in the previous exemplary embodiments comprises two folding lines 31 defining a central, rectangular area 3c, and two lateral areas 3a, 3b having the shape of isosceles triangles, each of said lateral areas having two equal, free sides 35 being slightly longer than the length of the side of said regular hexagon of the top surface 1. These lateral, triangular areas 3a, 3b are thus not connected to the extensions 4a, 4b of the stationary panel 4, and in the assembled arrangement and due to their bigger length adopt by themselves a bent position wit respect to the central, rectangular area 3c. This bent position forms part of said tridimensional arrangement giving more strength to the base of the tumbler.

[0024] On the other hand, the movable and stationary panels 2, 4 are also of a shorter height as compared with the side wall panels 6, but in this case also the bottom edges of the side wall panels 6 are out of alignment and offset downwards with respect to the folding line 42 establishing the connection of the stationary panel 4 with the base panel 3. This in the assembled arrangement being shown in a bottom perspective view in Fig. 9 causes the base panel to be retracted towards the inside and at a distance from a plane supporting the tumbler. In order to provide a proper support and a good horizontal positioning of the base panel 3 and the top surface 1 the lateral extensions 2a, 2b of the movable panel 2 are provided with extensions 25 by way of feet being dimensioned in such a way that in said assembled arrangement said extensions 25 are abutting with said stationary supporting plane such as a table.

[0025] Referring now to Figs. 10 through 13 these latter show a tumbler as per the present invention having many similarities with the tumblers of the exemplary embodiments having been described above although the final shape is different, the same reference numerals having hence been used for equivalent elements in its description.

[0026] As in the previous examples a developed surface 104 comprises a first strip being successively formed by a first top surface panel 1a provided with a first opening 5a, a movable panel 2, a bottom panel 3, a stationary panel 4 and a second top surface panel 1b provided with a second opening 5b, all of these panels being connected to each other through folding lines 21, 22, 46, 41. Nevertheless, here the first and second top surface panels 1a, 1b have an ojival shape, and the movable and stationary panels 2, 4 have a width being approximately equivalent to the rectilinearly developed length of the curved sides of said ojival shape. From a side of the stationary panel 4 derives a second strip being in this case formed by two side wall panels 6 having a width being as well substantially equal to said rectilinearly developed length.

[0027] Also in this example of Figs. 10 through 13 the tumbler is apt to be arranged in a packed, planar arrangement being apt for its storage and transportation, in said packed, planar arrangement all of the panels, surfaces and walls being fully or partially superimposed in a substantially coplanar arrangement (Fig. 11), and in an assembled arrangement being apt for its use, in said assembled arrangement said top and bottom surfaces 1, 3 being perpendicular to the side walls 6, and wherein the movable panel 2 constitutes a second inner reinforcing wall, with the particularity that the assembly adopts in this case a shape of a body having an ojival cross-section (Fig. 12), with two warped side walls and an innerly curviconcave bottom (Fig. 13) comprising a lower level area being flush with bottom edges of the side walls 6 and resting on a supporting surface supporting the tumbler.

[0028] Said folding lines 21, 22 and 41 are of relatively short length in order to allow the connection and folding between panels having curved lines without forcing to curve said panels. The folding line 46 connecting the bottom panel 3 with the stationary panel 4 is in contrast of a relatively long length and has means being such that when the folding operation is carried out along said folding line 46 both said bottom panel 3 and the stationary panel 4 are forced to adopt a given warped configuration. The stationary panel 4 does for such a purpose comprise an extension 45 being connected to it through a folding line 42a, said bottom panel 3 being connected to said extension by means of said folding line 46, this latter being formed by a combination of alternated slits 46a and embossed indentations 46b of short length, each slit 46a of short length being connected at its central area to a longer slit 47 extending through said extension 45 and towards the inside of the stationary panel 4 following a direction parallel to the lateral edges of said stationary panel and thereby perpendicularly crossing said folding line 42a, in such a way that when the tumbler

is arranged in said assembled arrangement the side wall panels 6 adopt said warped configuration while the bottom surface panel 3 adopts an innerly curviconcave, tridimensional configuration (see Fig. 13) giving more rigidity to the assembly.

[0029] Returning now to said developed surface 104, the bottom surface panel 3 has a substantially ojival shape with two curviconvex sides one of them being the one facing the movable panel 2 having trimmed-off portions 36 at the ends in order to facilitate the passage of extensions 25 of the movable panel 2, this latter having a side facing the bottom surface panel 3 with a central, curviconvex portion 26 between said extensions 25. On the other hand, both the folding line 62 establishing the connection of a side wall panel 6 with the stationary panel 4 and the folding line 61 mutually connecting the two side wall panels 6 are formed by two rectilinear, embossed indentations being close to each other to thus cause the fold to form a slightly chamfered edge. The movable and stationary panels 2, 4 do besides comprise folding lines 28, 48 being relatively close and parallel to both lateral edges of said panels to thus facilitate a slight folding of said edges thus easing the pressure on the side walls in the assembled arrangement.

[0030] Also in the developed surface 104 all of its areas being visible both when the tumbler is arranged in said packed, planar arrangement (Fig. 11) and when said tumbler is arranged in said assembled arrangement (Fig. 12) are in one and the same printable face of the starting sheet material. Also the die-cutting and assembly operations including the folding and gluing operations can be carried out automatically with the conventional apparatus of the graphic arts industrial sector.

[0031] As has been evidenced above, in any of the three exemplary embodiments the tumbler is obtained from one only piece of a printable sheet material typically being a paperboard having a grammage comprised between 250 and 350 g/m^2 and one only glazed face provided to receive the totality of said graphic information in one only printing operation to be carried out before the die-cutting, folding and gluing operations. Other materials such as plastic sheet, waxed, plastic-coated or metal paper and the like are nevertheless also possible.

[0032] It is also possible to construct tumblers having a polygonal cross-section in the shape of an irregular hexagon or in a shape different from an hexagon, provided that said polygonal shape has two opposite, mutually parallel sides being respectively connected to said movable and stationary panels 2, 4 and being flanked at both sides by one and the same even number of sides, and that said outer side faces formed by the side wall panels 6 are in a number being equal to the total number of sides of said polygonal shape and are of a width equal to a respective side of said polygonal shape.

[0033] An alternative embodiment of the invention provides that the openings (5a, 5b) of the top surface panels are of rectangular shape, in which case besides of being used for writing articles the tumbler can also be used to display brochures being arranged in such a way that they are introduced through said oblong opening and project from the top of the tumbler in order to be thus picked.

Claims

1. A tumbler for writing articles, said tumbler comprising a top surface (1) provided with an opening (5), a bottom surface (3), a panel (2) being movable during the assembly and disassembly and being connected at opposite ends to said top surface (1) and said bottom surface (3) through respective folding lines (21, 22), said top and bottom surfaces (1, 3) being as well connected in a hinged connection to at least one first inner reinforcing wall connected to surrounding outer side walls (6), said top and bottom surfaces (1, 3), movable panel (2) and first inner reinforcing wall forming a foldable, hinged quadrilateral, in such a way that said tumbler is apt to be arranged in a packed, planar arrangement being apt for its storage and transportation, in said packed, planar arrangement all of the panels, surfaces and walls being fully or partially superimposed in a substantially coplanar arrangement, and in an assembled arrangement being apt for its use, in said assembled arrangement said top and bottom surfaces (1, 3) being perpendicular to said side walls (6), said movable panel (2) constituting a second inner reinforcing wall; **characterized in that** it is obtained from one only piece of printable sheet of uniform thickness being apt to be die-cut, indented, bent and glued in a fully automated process, wherein all those surfaces being useful as a graphic information carrier and being visible both when said tumbler is arranged in said packed, planar arrangement and when said tumbler is arranged in said assembled arrangement belong to one and the same face of said printable sheet piece, and **in that** a developed surface (101, 102, 104) of said tumbler having been die-cut from said printable sheet piece comprises a first strip being formed by those panels and surfaces making up the hinged quadrilateral, said panels being connected to each other through mutually parallel folding lines, and a second strip perpendicularly deriving from at least one side of said first strip through at least one folding line and being formed by a plurality of side wall panels (6) being connected to each other through mutually parallel folding lines (61).

2. A tumbler as per claim 1, **characterized in that** said top surface (1) is formed by superimposing and gluing together a first and a second top surface panels (1a, 1b) being provided with respective first and second openings (5a, 5b) and being situated at op-

posite ends of said first strip.

3. A tumbler as per claim 2, **characterized in that** in said assembled arrangement said bottom surface (3) adopts a tridimensional configuration giving rigidity to the assembly.

4. A tumbler as per claim 3, **characterized in that** said tridimensional configuration of the bottom surface (3) in said assembled arrangement comprises a lower level area being flush with the bottom edges of said side wall panels (6) and resting on a stationary plane supporting the tumbler.

5. A tumbler as per claim 3, **characterized in that** in said developed surface (101, 102, 104) said first at least one inner reinforcing wall is formed by a stationary panel (4) being connected at opposite sides to said second top surface panel (1b) and said bottom surface (3) through respective folding lines (41, 42), from said stationary panel (4) and through a folding line (62) situated at one side connecting said opposite sides deriving said second strip being formed by said plurality of side wall panels (6).

6. A tumbler as per claim 5, **characterized in that** in said developed surface (101, 102, 104) said folding line (22) establishing the connection between the movable panel (2) and the bottom surface (3) and said folding line (42) establishing the connection between the stationary panel (4) and the bottom surface (3) are situated at opposite sides of said bottom surface (3).

7. A tumbler as per claim 6, **characterized in that** said folding lines comprise embossed indentations and/or slits and/or notches along which said developed surface (101, 102, 103, 104) is apt to be folded in such a way that said first and second top surface panels (1a, 1b) are superimposed on one another with said first and second openings (5a, 5b) in register, their mutually contacting faces being the opposite faces of the printable sheet piece, said first and second top surface panels then being glued to each other thus forming said top surface (1), and at least the last of said side wall panels (6) is superimposed on said stationary panel (4) and glued to at least one area of this latter thus forming said surrounding side walls (6).

8. A tumbler as per claim 7, **characterized in that** said movable and stationary panels (2, 4) are of a shorter height as compared with the side wall panels (6), top edges of the side wall panels (6) being out of alignment and upwardly offset with respect to the folding line (41) establishing the connection of the stationary panel (4) with the second top surface panel (1b), in such a way that in said assembled arrangement the top surface (1) is at a lower level with respect to said top edges of the side wall panels (6).

9. A tumbler as per claim 7, **characterized in that** said top surface (1) formed by the first and second top surface panels (1a, 1b) is of a polygonal shape with two mutually parallel, opposite sides respectively connected to said movable and stationary panels (2, 4), said two mutually parallel, opposite sides being at both sides flanked by one and the same even number of sides, and said outer side faces formed by the side wall panels (6) are in a number being equal to the total number of sides of said polygonal shape and are rectangular, all of them having the same given height and each having a width being equal to a corresponding side of said polygonal shape, the assembly adopting in said assembled arrangement a prismatic shape.

10. A tumbler as per claim 9, **characterized in that** said polygonal shape is a hexagon.

11. A tumbler as per claim 10, **characterized in that** said hexagon is regular and said opening (5) of the top surface is circular or rectangular and is arranged in a centred arrangement.

12. A tumbler as per claim 11, **characterized in that** said developed surface (101, 102) does besides comprise lateral extensions (2a, 2b) of the movable panel (2) being connected to this latter through respective folding lines (23, 24), and lateral extensions (4a, 4b) of the stationary panel (4) being connected to this latter through respective folding lines (43, 44), the widths of the movable and stationary panels (2, 4) and of the lateral extensions (2a, 2b, 4a, 4b) being substantially equal to the length of the side of said hexagon, the lateral extension (4a) of the stationary panel (4) being interposed between the stationary panel (4) and the side wall panels (6) and connected to these latter through said folding line (62).

13. A tumbler as per claim 12, **characterized in that** said movable and stationary panels (2, 4) are of a shorter height as compared with the side wall panels (6), said lateral extensions (2a, 2b) of the movable panel (2) being provided with extensions (25) by way of feet being dimensioned in such a way that in said assembled arrangement said extensions (25) are abutting with a stationary supporting plane thus defining the correct position of the top and bottom surfaces (1, 3).

14. A tumbler as per claim 12, **characterized in that** said bottom surface panel (3) comprises two mutually parallel folding lines (31) being respectively

aligned with said folding lines (23, 43, 24, 44) establishing the connection between said movable and stationary panels (2, 4) and their respective lateral extensions (2a, 2b and 4a, 4b), said folding lines (31) defining in said bottom surface panel (3) a central, rectangular area (3c) and two lateral areas (3a, 3b).

15. A tumbler as per claim 14, **characterized in that** in said developed surface (101) each of said lateral areas (3a, 3b) has a triangular shape with two equal free sides (35) having a length being slightly bigger than the length of the side of said regular hexagon of the top surface (1), in such a way that when being arranged in said assembled arrangement the bottom surface panel (3) adopts said tridimensional configuration enhancing the rigidity.

16. A tumbler as per claim 15, **characterized in that** in said developed surface (102) each of said lateral areas (3a, 3b) is besides connected to said lateral extensions (4a, 4b) of the stationary panel (4) through folding lines (34a, 34b) being at both sides aligned with the folding line (42) establishing the connection of the stationary panel (4) with the bottom surface panel (3), a relatively long folding line (34a-42-34b) being thus formed as a consequence of all this, this latter folding line assuring an accurate positioning of the first top surface panel (1a) when being superimposed on the second top surface panel (1b) to be later on glued together with it during an automated production step, each of said lateral areas (3a, 3b) comprising oblique folding lines (32, 33) defining triangular areas which when the tumbler is arranged in said assembled arrangement are inwardly folded thus giving to the bottom surface panel (3) said tridimensional configuration enhancing the rigidity.

17. A tumbler as per claim 11, **characterized in that** the first top surface panel (1a) comprises tabs (11, 12) being connected through respective folding lines (13, 14) to two of its sides being adjacent to its side being connected to the movable panel (4), said folding lines (13, 14) being secants intersecting the sides of the hexagon, and said tabs (11, 12) have pointed ends (15), whereas the second top surface panel (1b) comprises tabs (16, 17) being connected through respective folding lines (18, 19) to two of its sides being adjacent to its side being connected to the stationary panel (4), in such a way that in the assembled position the tabs (11, 12) are bent with their pointed ends (15) leaning against the inner face of the also bent tabs (16, 17) thus creating a reinforcement of the top surface (1) in the transversal direction.

18. A tumbler as per claim 7, **characterized in that** said top surface formed by the first and second top surface panels (1a, 1b) has an ojival outer shape, and said outer side faces formed by the side wall panels (6) are in a number of two and are rectangular, both being of a same given height and each having a width being equal to the rectilinearly developed length of the corresponding sides of said ojival shape, in said assembled arrangement the assembly adopting the shape of a body having an ojival cross-section with two warped side walls and an innerly curviconcave bottom.

19. A tumbler as per claim 18, **characterized in that** in said developed surface (104) the bottom surface panel (3) has a substantially ojival shape with a curviconvex side facing the movable panel (2) and having trimmed-off portions (36) at the ends, said movable panel (2) having a side facing the bottom surface panel (3) with a central, convex portion (26), and **in that** both the folding lines (21 and 22) establishing the connection of the movable panel (2) with the first top surface panel (1a) and the bottom surface panel (3), respectively, and the folding line (41) establishing the connection of the stationary panel (4) with the second top surface panel (1b) are rectilinear and of relatively short length, whereas a curved folding line (46) connecting said bottom surface panel (3) with an extension (45) of said stationary panel (4) connected to this latter through a folding line (42a) is formed by a combination of alternated slits (46a) and embossed indentations (46b) of short length, each short length slit (46a) being connected at its central area to a longer slit (47) extending through said extension (45) and towards the inside of the stationary panel (4) following a direction parallel to the lateral edges of said stationary panel and thereby perpendicularly crossing said folding line (42a), in such a way that when the tumbler is arranged in said assembled arrangement the side wall panels (6) adopt said warped configuration while the bottom surface panel (3) adopts an innerly curviconcave, tridimensional configuration by way of said tridimensional configuration enhancing the rigidity.

20. A tumbler as per claim 19, **characterized in that** both the folding line (62) establishing the connection of a side wall panel (6) with the stationary panel (4) and the folding line (61) mutually connecting the two side wall panels (6) are formed by two rectilinear, embossed indentations being close to each other, and **in that** the movable and stationary panels (2, 4) comprise relatively close folding lines (28, 48) being parallel to both lateral edges of said panels.

21. A tumbler as per claim 19, **characterized in that** the openings (5a, 5b) of the top surface panels (1a,

1b) are of elliptic or rectangular configuration.

22. A tumbler as per claim 1, **characterized in that** said printable sheet piece is a paperboard having a grammage comprised between 250 and 350 g/m^2 and one only glazed face provided to receive the totality of said graphic information in one only printing operation to be carried out before the die-cutting, folding and gluing operations

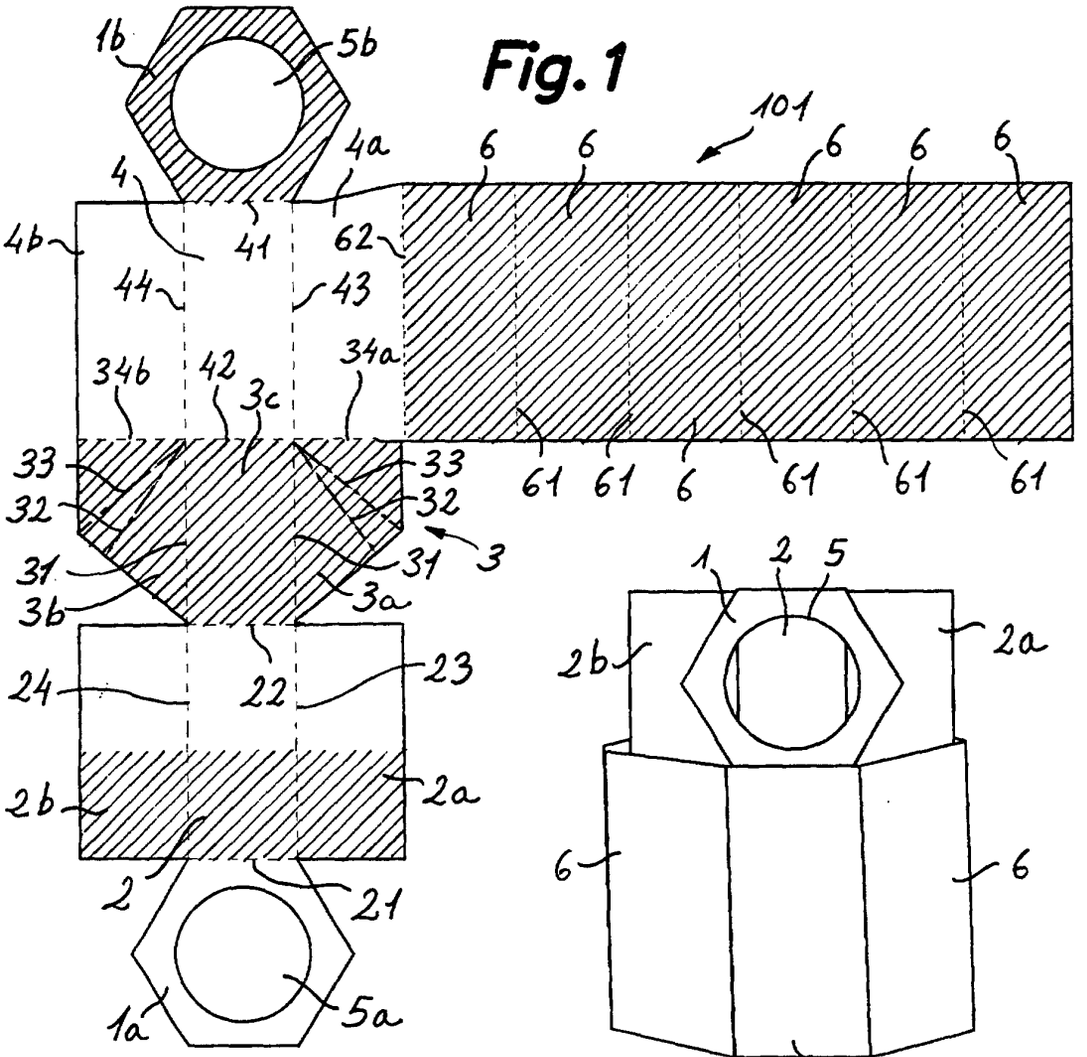


Fig. 1

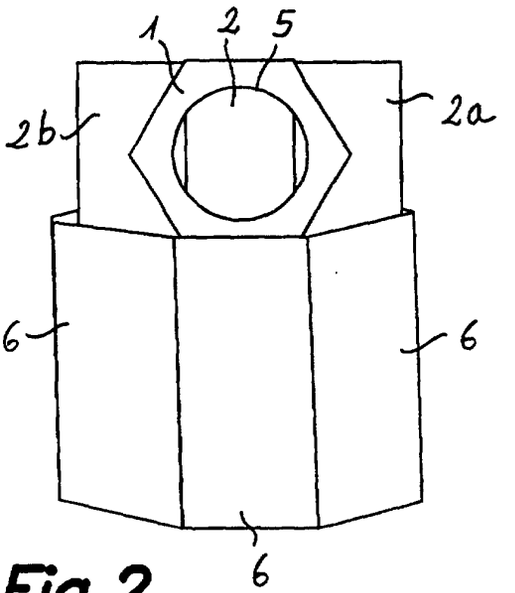


Fig.2

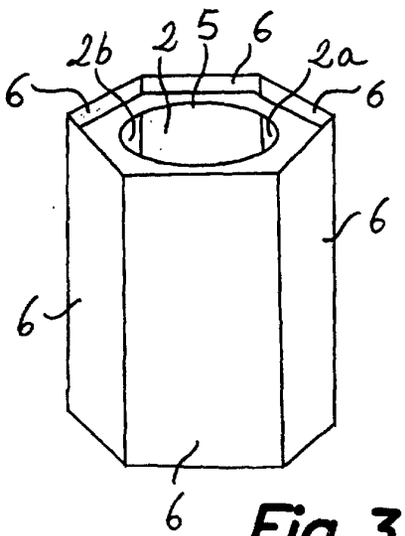


Fig.3

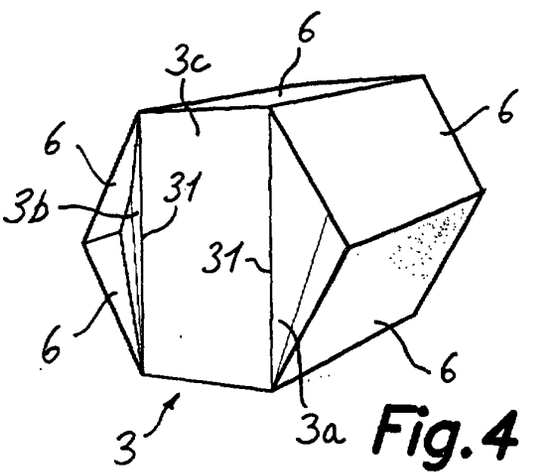


Fig.4

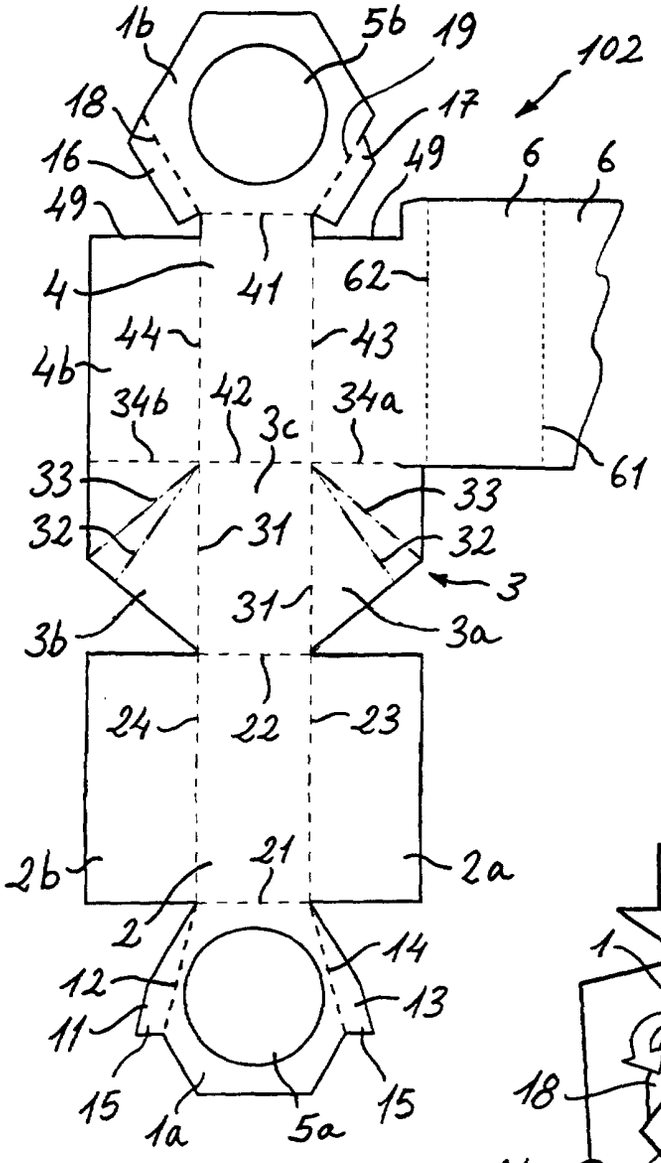


Fig.5

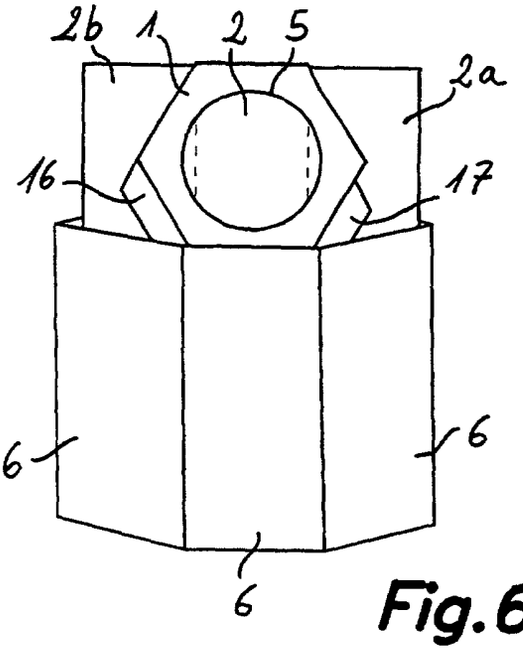


Fig.6

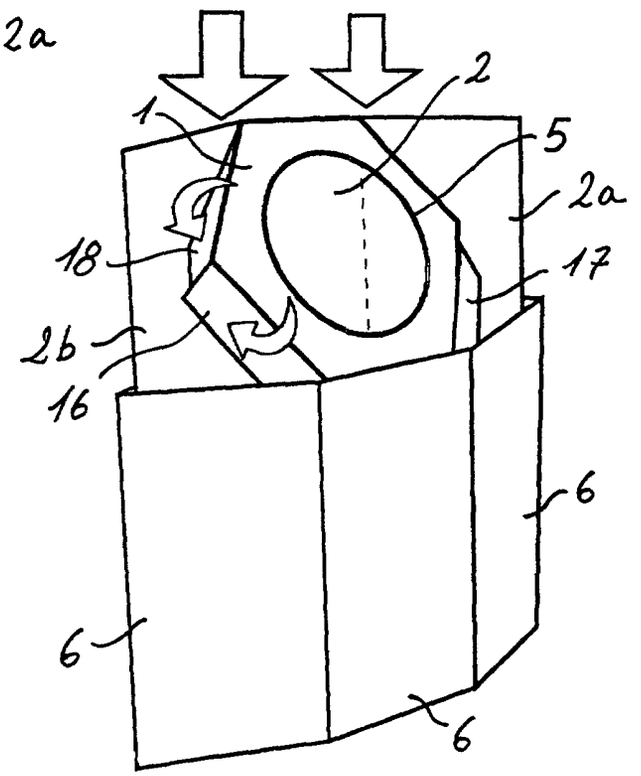
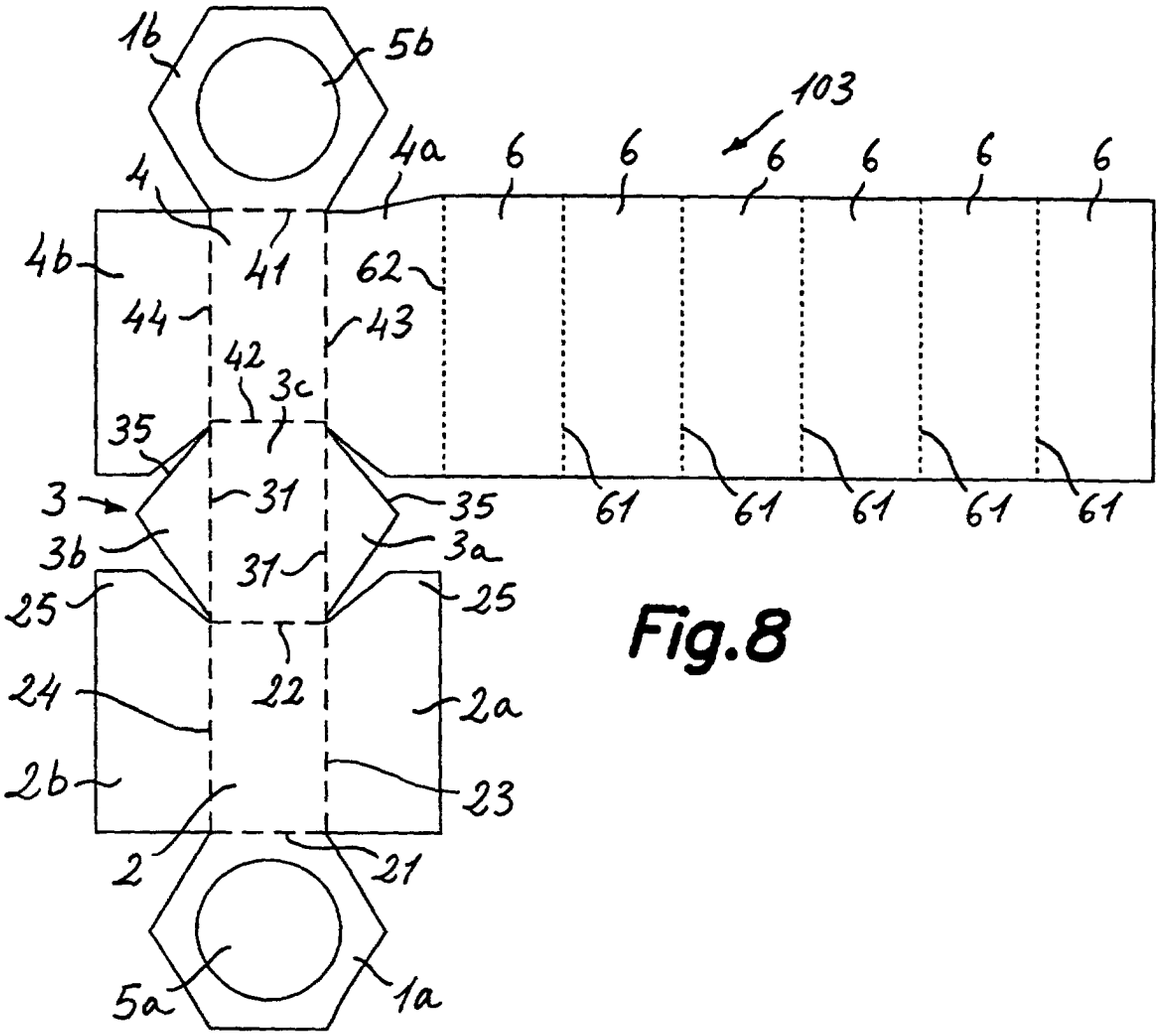


Fig.7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5b
103
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62
4b
44
43
42
3c
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21
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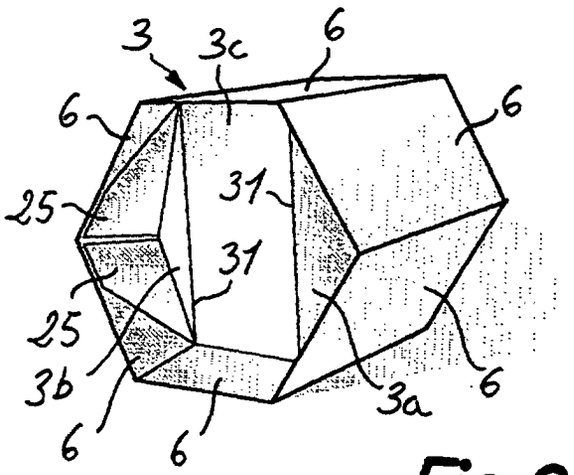
1a

Fig.8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3a

Fig.9

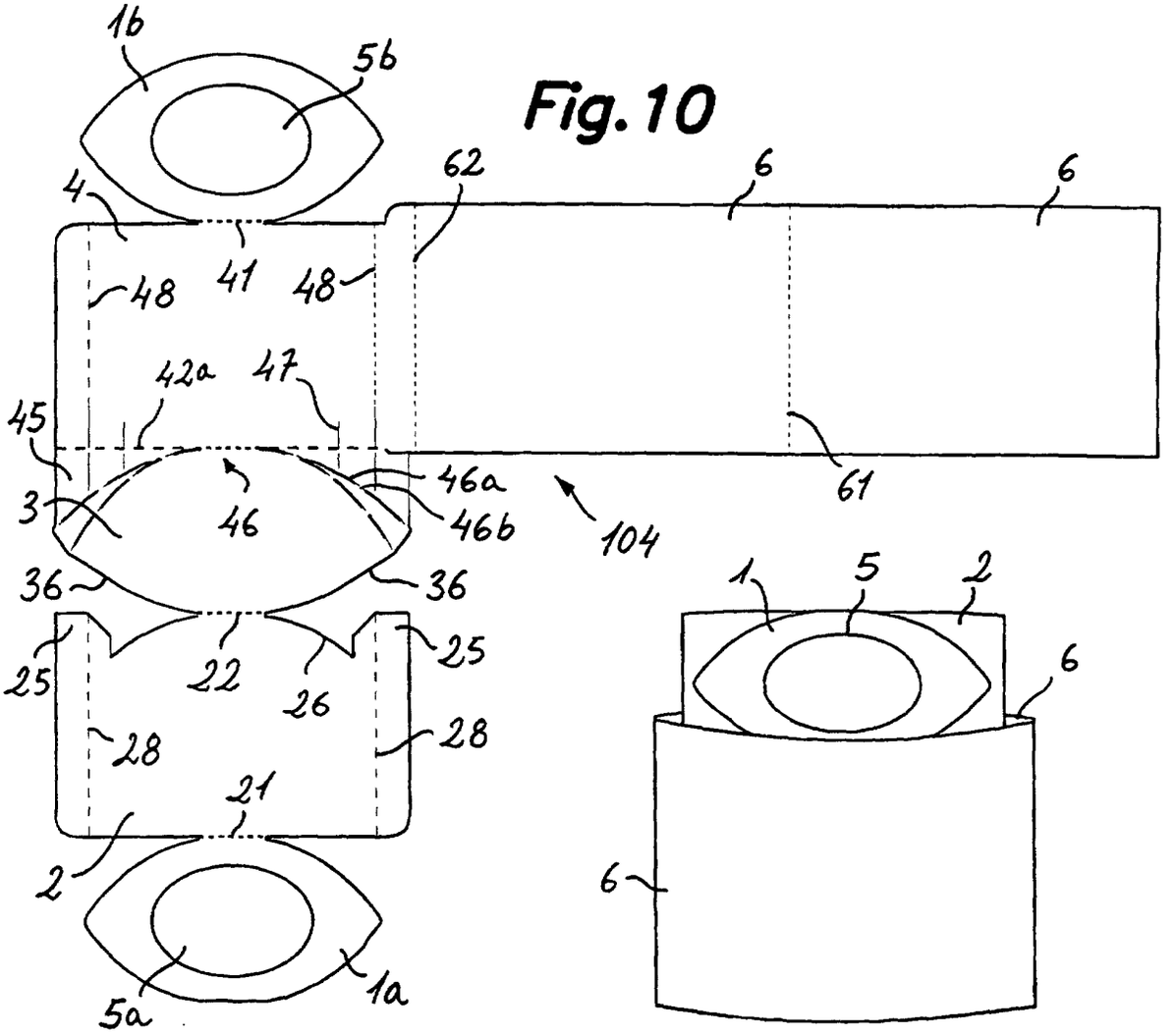

Fig. 10

Fig. 11

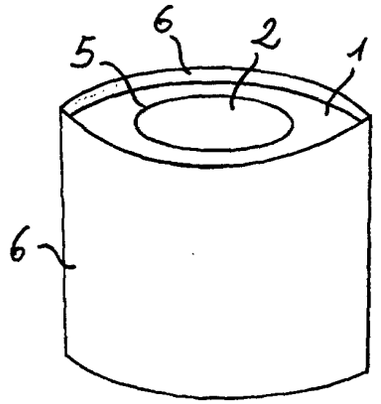

Fig. 12

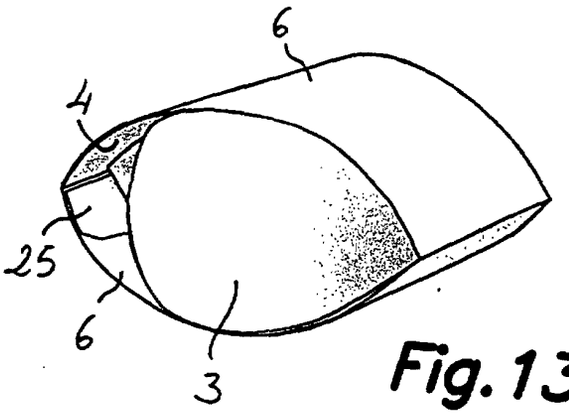

Fig. 13

INTERNATIONAL SEARCH REPORT

International application n°
PCT/ ES 00/00372

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B43M17/00 ; A45C11/34
According to International Patent Classification (IPC) or to both national classification and

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A45C, A63F, A63H, B43K, B43M B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ES 1039122 U (FERNANDEZ JULIA) 16 October 1998 (16.10.98), column 2, Line 49 – line 4, column 24 ; figures 1-3	1, 4. 7-11, 14, 17-22
A	ES 28666669 U (TORRAS HOSTENCH) 01 June 1985 (01.06.85)	
A	ES 213611 U (ARTES GRAFICAS SAN JUAN) 16 November 1976 (16.11.76)	
A	ES 1040130 U (PROMOTEC) 01 March 2000 (01.03.00)	
A	GB 400907 A (SENNET) 30 January 1932 (30.01.32)	
A	US 4619426 A (DRUEK et al.) 28 October 1986 (28.10.86)	
A	US 4002237 A (NICHOLS) 11 January 1977 (11.01,77)	
A	US 2439435 A (MOISTUREPROOF) 13 April 1948 (13.04.48)	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents.

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot beconsidered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 November 2000 (29.11.00)	11 December 2000 (11.12.00)
Name and mailing address of the ISA/ RU	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992) Page 1

INTERNATIONAL SEARCH REPORT
Information on patent family members

International Application No
PCT/ ES00/00372

Patent document cited in search report	Publication date	Patent familiy member(s)	Publication date
ES 1039122 U	16.10.1998		
ES 2866669 U	01.06.1985		
ES 213611 U	16.11.1976		
ES 1040130 U	01.03.2000		
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Form PCT/ISA/210 (patent family annex) (July 1992)