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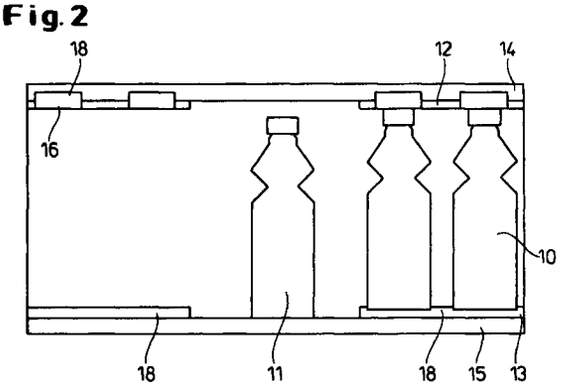
(54) Bottle case

(57) The present invention is directed to a case (1) having six substantially rectangular sides, which comprises top and bottom sides opposing each other, left and right sides opposing each other, and front and back sides opposing each other, further comprising top inner flaps (12) and bottom inner flaps (13), top outer flaps (14) and bottom outer flaps (15), said top inner flaps (12) being disjoined, and said case containing at least two package units disposed in at least one layer, characterized in that, the distance between the top of a package unit and the corresponding internal surface of the case is substantially equal, for all the package units in the uppermost layer, so that said package units substantially equally contribute in carrying the top load, for example when several cases are stacked in a pallet.

Fig. 2



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Description

Field of the invention

[0001] The present invention relates to a case for grouping package units.

Background of the invention

[0002] Regular cardboard slotted cases, containing bottles for handling and shipping from a manufacturing plant to a point of sale are representative of the various cases for grouping package units, to which the present invention can apply. For example, such cases made out of cardboard, have a substantially parallelepipedal shape with six sides and twelve edges, respectively, the top, bottom, back, front, left and right sides. For definition purposes as well, we will consider that in normal upright position, the top and bottom sides are in the horizontal plane, the four other sides being vertical. If the front side is facing an observer, the left side of the case is on the left of the observer, the right is on the right of the observer, and the back side is invisible to the observer.

[0003] Such cases are usually folded and glued/stapled from a corresponding flat structure which is die cut, or slotted cut, both of these manufacturing processes being well known by those skilled in the art. The flat structure is usually made out of one single piece for cost reasons. Furthermore, cardboard is not an isotropic material and so, it has a grain direction, which is the preferred direction along which the die cut is more resistant. In the case of corrugated cardboard, the grain direction corresponds to the direction of the corrugations.

[0004] Such cases further typically comprise left and right, and front and back side panels, as well as pairs of top inner flaps, bottom inner flaps, top outer flaps, and bottom outer flaps. Usually, the pairs of top and bottom inner flaps are not joined when the case is formed and closed, i.e. they do not cover the whole surface of respectively the top and bottom internal sides of the case, as shown in attached figure 1.

[0005] Each package unit (i.e. each bottle) has an inherent strength and can carry a certain top load for an extended period of time. While cases were usually designed such as to carry the full top load when several cases are stacked, the package unit (i.e. the bottle) is increasingly being put at contribution, in order to reduce the amount of packaging material used and the case cost. To do so, the case is dimensioned such as the bottle and the case reach their peak compression resistance together i.e. at the same deflection. For example, if the case reaches its peak at 12 mm of deflection and the bottle reaches it at 8 mm, the case must be 4 mm taller than the bottle to create the synergy and optimize the compression resistance.

[0006] Cases as described above have a number of disadvantages. With such cases, not all the package units (for example the bottles) of the uppermost layer are placed at the same level, relatively to the inner top surface of the case: while some are standing on the inner bottom flaps and show a gap of 4 mm with the inner top flaps, others are standing on the outer bottom flap only, and show a gap of 4 mm increased by 2 times the case corrugation thickness (usually about 8 mm). In such a configuration, only the package units (i.e. the bottles) placed on the inner bottom flaps (30 to 60% of a case count) can contribute to carrying the top load when several cases are stacked (see figure 1). In this way, the case, once filled, shows only limited compression resistance.

[0007] In order to solve this problem, some cases have been designed which have their internal small flaps positioned on the outside of the case, in such a way that only long flaps cover the surface of the top and bottom sides, either totally or partially. In this way, the distance between the internal surfaces of the top and bottom sides is the same all over the surface of the case: then, all package units shall carry the same portion of the top load. However, this requires a specific shape for the flat board, and a specific manufacturing, forming and closing process as well.

[0008] Thus, there is still a need for a cost-optimized case with internal short flaps, that can be manufactured on standard converting machines, for example a regular American slotted case, in which all package units of the contents equally contribute in carrying the top load.

[0009] It is therefore an object of the present invention to provide a case with high compression resistance when it is filled. This is achieved by providing it with a means that eliminates the height differences so as to place all contained package units top portions at the same distance from the internal surface of the top side of the case, thus allowing all said package units to equally contribute in carrying the top load when several cases are stacked.

Summary of the invention

[0010] The present invention is directed to a case having six substantially rectangular sides which comprises top and bottom sides opposing each other, left and right sides opposing each other, and front and back sides opposing each other, further comprising top and bottom inner flaps and top and bottom outer flaps, and containing at least two package units disposed in at least one layer, characterized in that, the distance between the top of a package unit and the corresponding internal surface of the case is substantially equal, for all the package units in the uppermost layer, so that said package units substantially equally contribute in carrying the top load.

Brief description of the drawings

[0011] The invention will now be explained in detail with reference to the accompanying drawings, in which:

- Figure 1 is a profile view showing a regular slotted case with uneven distance between top of the package units and inner surface of the case.
- Figure 2 is a profile view showing one preferred embodiment of the present invention applied to a regular slotted case with bottom inner flaps that are disjoined.
- Figure 3 is a profile view showing another embodiment of the present invention applied to a regular slotted case with bottom inner flaps that are joined.
- Figure 4 is a schematic top view of part of the top outer flaps showing the alternance of normal and crushed portions.
- Figure 5 is a top view of one inner top flap, showing the alternative of cut-outs or perforated portions.
- Figure 6 is a top view of the flat structure of a regular American slotted case, of the type FEFCO 0201, showing the crushed and punched portions of the flaps.

Detailed description of the invention

[0012] A case (1) has a polygonal shape, preferably a substantially parallelepipedic shape and, comprises at least six sides opposing each other in pairs, respectively the front and back sides, the left and right sides and the top and bottom sides. The overall proportions of the case (1) may vary in order to adapt to different volumes of contents. The case (1) is made out of corrugated cardboard or any other suitable material, such as for example plastic, but it is preferably made out of corrugated cardboard. Despite it is preferably entirely made out of one material, several materials can be used in a combination. Moreover, the case (1) can be made out of several separate elements that are assembled together, but is preferably made out of one whole single element.

[0013] In one preferred embodiment of the present invention, the case (1) is a regular American slotted case, used as a tertiary package for grouping several package units such as bottles, or groups of bottles, into at least one layer. Such a case (1) is usually referred to in the industry as standard FEFCO 0201.

[0014] All parts of such a case (1) are typically made out of the same type of corrugated cardboard. Each side of the case (1) is made out of at least one layer of corrugated cardboard. If a layer covers the entire surface of one side, it is called a panel. If it covers only a portion of the side, it is then called a flap.

[0015] The front and back, and left and right sides of the case (1) comprise respectively front and back, and left and right panels. As for the top and bottom sides of the case, they are made of two layers of cardboard, one inner layer and one outer layer. The top inner layer comprises two top inner flaps (12) that are preferably smaller than the whole surface of the top side, so that said top inner flaps (12) are disjoined when the case (1) is formed and closed. The bottom inner layer similarly comprises two bottom inner flaps (13). Optionally but preferably, said two bottom inner flaps (13) are disjoined when the case (1) is formed and closed (see figure 2), but they can also be joined so as to cover the entire surface of the bottom side (see figure 3). The outer layers of the top and bottom sides comprise respectively two top outer flaps (14) and two bottom outer flaps (15). Optionally but preferably, the surface covered by the two top outer flaps (14) is substantially equal to the surface of the top side of the case, so that when the case (1) is formed and closed, both top outer flaps (14) are joined. Similarly, the surface covered by the two bottom outer flaps (15) is substantially equal to the surface of the bottom side of the case, so that when the case (1) is formed and closed, both bottom outer flaps (15) are joined.

[0016] Once the case (1) is erected, said top and bottom outer flaps (15) are disposed in a direction that is perpendicular to the direction of respectively, the top and bottom inner flaps. Different ways of closing the case (1) may be used, for example by using glue, staples, or adhesive tape. If glue is used, it can be cold glue applied by the means of rollers, but is preferably hot melt glue applied by the means of spraying nozzles. The techniques of forming the case (1) out of the corresponding flat structure, and closing it, could it be by gluing, stapling, or tape-wrapping, are well known by those skilled in the art.

[0017] In other embodiments of the present invention, variations of the preferred standard FEFCO 0201 case (1) design shall be admitted, that comprise top and/or bottom outer flaps with reduced surface, such that respectively top outer flaps (14) are disjoined and/or bottom outer flaps (15) are disjoined once the case (1) is erected and closed. However, and especially if the bottom inner flaps (13) are disjoined when the case (1) is erected and closed, the distance between said flaps (14) and (15) shall be chosen small enough to prevent the contained package units from falling out of the case (1) while it is closed for handling and transportation.

[0018] The present invention is achieved firstly by providing each of the top and/or bottom inner flaps of the case (1) with at least one portion with a reduced thickness, and/or punches or cut-outs. Secondly and optionally (depending on the cardboard case structure), each top outer flap (14) can comprise at least one portion with a reduced thickness. The flaps can be crushed in a region corresponding to the location of one package unit, or in a region corresponding to the location of a group of package units, or alternatively, the whole surface of the flap can be crushed. The combination of crushed and/or punched and/or cut-out portions in the flaps of the case allows to correct the height difference

between the top part of some bottles and the top part of the others, relatively to the internal surface of the top side of the case. This is further exemplified in the two following possible embodiments of the present invention.

[0019] In a preferred embodiment of the present invention, as shown in figure 2, the case (1) is a cardboard standard American slotted case, of the type FEFCO 0201 that comprises bottom inner flaps (13) that are disjoined. When the case (1) is erected, filled, and closed, some package units (10) are positioned between the top and bottom inner flaps (12) and (13). The other package units (11) are positioned between the top and bottom outer flaps (14) and (15), as shown in figure 2. In order to ensure that the distance between the top parts of said other package units (11) and the internal surface of the top side of the case (1) is not greater by two times the thickness of the inner flaps, compared to the distance between the top parts of the package units (10) and the internal surface of the top side of the case (1)(see figure 2), the top inner flaps (12) comprise punched portions (16) or cut-out portions (17) throughout the full thickness of the cardboard. As shown in figure 5, the portions (16) that are punched correspond to the location of one package unit. Alternatively, the cut-out portions (17) are cut-out longitudinally.

[0020] Furthermore, and as shown in figure 2, each of the bottom inner flaps (13) and the top outer flaps (14) comprises at least one portion whose thickness is reduced down to half the normal initial thickness of the material by crushing it. As for the punched portions, the crushed portions (18) can be local portions corresponding to the location of one package unit, or alternatively, they can be longitudinal bands that correspond to the grouping of several bottles, as shown in figure 4.

[0021] In a second embodiment of the present invention, the case (1) comprises bottom inner flaps (13) that are joined when the case (1) is erected and closed, then, the reduction of thickness that is applied to the top flaps shall be adapted: in this particular case, all package units are positioned at the same level on the internal surface of the bottom side of the case. In order to ensure that the distance between the top of one package unit and the internal surface of the top side of the case (1) is the same for the package units (10) that are positioned between the top and bottom inner flaps (13), and also for the package units (19) that are positioned between the bottom inner flaps (13) and the top outer flaps (14), the top inner flaps (12) are punched through their entire thickness. In this particular embodiment of the present invention, there is no need for crushing the inner or outer flaps.

[0022] The reduction of thickness in local portions or longitudinal bands is achieved by crushing the cardboard by the means of a roll or a punch, depending on the case (1) manufacturing process (see description of the processes below).

[0023] When the cases are to carry a load on their top side, and due to the substantially equal distance between the top of each package unit of the uppermost layer and the corresponding internal surface of the case (1) top side, all the package units will substantially equally participate in carrying the top load. Said substantially equal distance shall be of 0mm (i.e. contact between the top of all the package units of the uppermost layer and the internal surface of the case (1) top side) or more. This distance shall be dimensioned in such a way that the package unit and the case (1) reach their peak compression resistance together (i.e. at the same deflection).

[0024] Any suitable process for making the crushed and/or punched portions shall be applied, depending on the manufacturing process of the rest of the case, and more specifically depending on the material which is used to form the case. Preferably, the making of the portions of the flaps with reduced thickness and /or cut-outs and punches, should not be a separate, supplemental step compared to the normal manufacturing process of a case.

[0025] In the preferred embodiment of the present invention in which the case (1) is made out of corrugated cardboard, the production of crushed and/or punched flaps is applicable on standard converting machines, thus avoiding the need for supplemental manufacturing step when making the flat structure of the case. The flat structure of the case (1) can be either slotted, or die cut. Both of these processes for manufacturing the flat structure of the case (or flat board) are widely used and known by those skilled in the art of making cases.

[0026] If it is made as a slotted case, punched, or preferably cut-out portions (17), and crushed portions (18) are usually performed on the printing machine: paper sheets are cut by cylinders onto which blades and scoring tools are fitted. The scoring operation is an operation of crushing the cardboard along folding lines so as to facilitate the folding operation , while the cutting gives the surface and final dimensions of the case.

[0027] If the case (1) is made out of a die-cut, the cut-out portions (17), the punched (16) and crushed portions (18) are performed at the time the case (1) is cut: with a frame fitted with blades that is pushed onto the sheet of paper to punch out what is not needed and perform the scoring operation as well. said die cut is erected, filled and glued by a normal process which is well known by those skilled in the art.

[0028] Finally, when the case (1) is made out of corrugated cardboard, a supplemental way of making the contents contribute to carrying a top load can be used in combination with the above described features of the case. Corrugated cardboard comprises at least 3 layers: one flute (which contains the corrugations), an internal layer and an external layer. While the internal and external layers are attached to the flute (which is positioned as the medium layer), the internal layer is made out of a stronger paper than the external layer so

as to create an unbalanced cardboard. In this way, and under compression the cardboard tends to bend to the inside of the case.

[0029] However and especially when the case (1) is filled with its contents, the bending movement of the cardboard towards the inside of the case (1) is counterbalanced, and stopped in a stable position by the contents, for example the bottles, thus increasing the compression resistance of the case, since the load is also carried by the contents. The orientation of the stronger layer to the inside of the case (1) may be obtained by placing the stronger sheet of paper first in the board making machine. May this prove to be a difficult operation, it can be placed last in the board making machine, or the whole stack of boards can be reverted between the board making unit and the case (1) forming station. The latter allows easier making process of the cardboard.

Claims

1. A case (1) which comprises top and bottom sides opposing each other, left and right sides opposing each other, and front and back sides opposing each other, further comprising top inner flaps (12) and bottom inner flaps (13), and top outer flaps (14) and bottom outer flaps (15), said top inner flaps (12) being disjoined, and said case (1) containing at least two package units disposed in at least one layer, characterized in that, the distance between the top of a package unit and the corresponding internal surface of the case top side is substantially equal for all the package units in the uppermost layer, so that said package units substantially equally contribute in carrying the top load.

2. A case (1) according to claim 1, wherein each of the top inner flaps (12) and/or bottom inner flaps (13) of the case (1) comprises at least one portion with:

   a) a thickness that is reduced compared to the initial thickness of the packaging material, and/or
   b) punches or cut-outs,

   said at least one portion corresponding to the location of the package units (10) arranged between said top and bottom inner flaps.

3. A case (1) according to any of the preceding claims, wherein each top outer flap (14) comprises at least one crushed portion (18) with a thickness that is reduced compared to the initial thickness of the packaging material.

4. A case (1) according to any of the preceding claims, wherein the thickness of the packaging material in said at least one crushed portion (18) of said top and/or bottom inner flaps, and/or of said top outer flaps (14), is substantially equal to half the initial thickness of the packaging material.

5. A case (1) according to any of the preceding claims, which is made out of corrugated cardboard.

6. A case (1) according to any of the preceding claims, which is a regular American slotted case, of the type FEFCO 0201.

7. A case (1) according to claims 1 to 5, which is formed out of a flat die cut structure.

Fig. 1

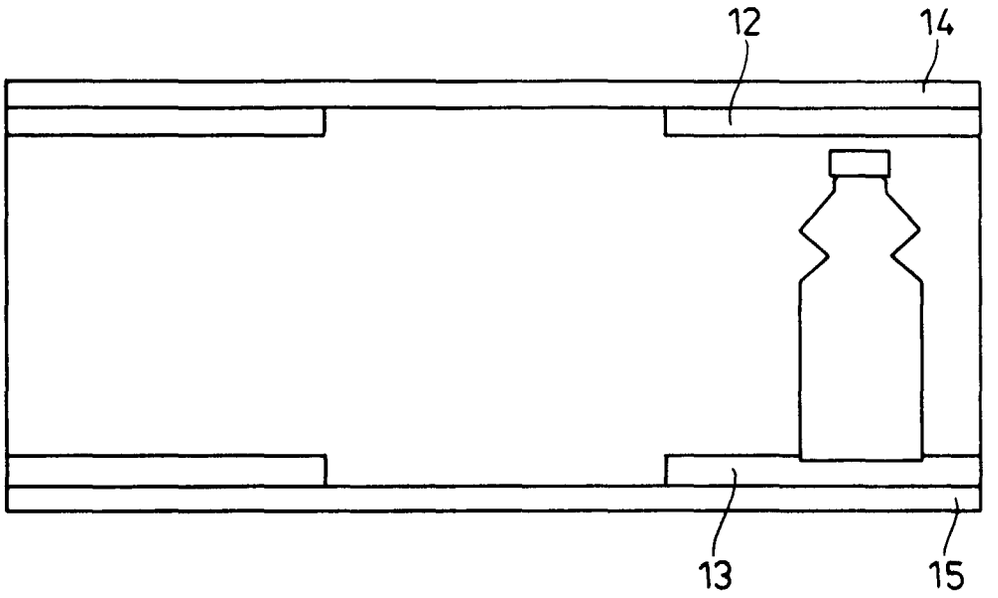


Fig. 2

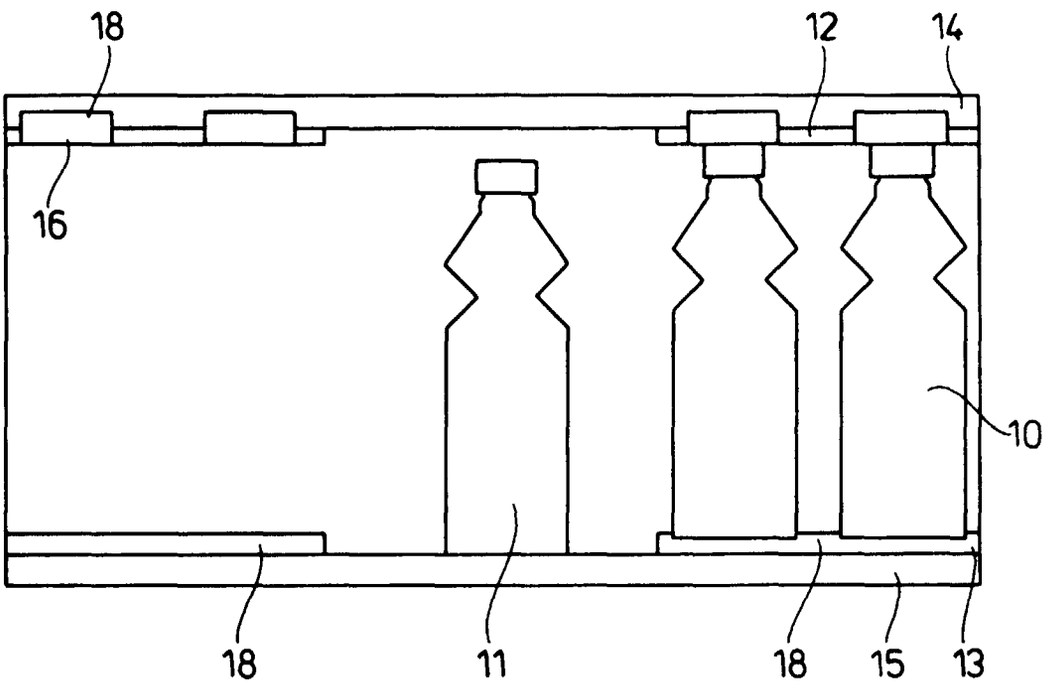


Fig. 3

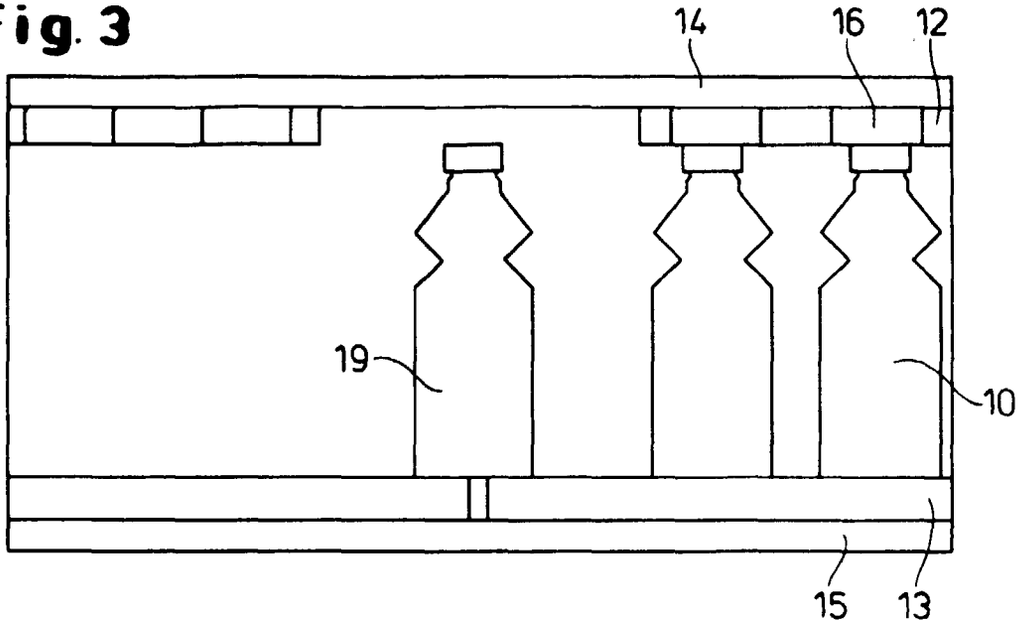


Fig. 4

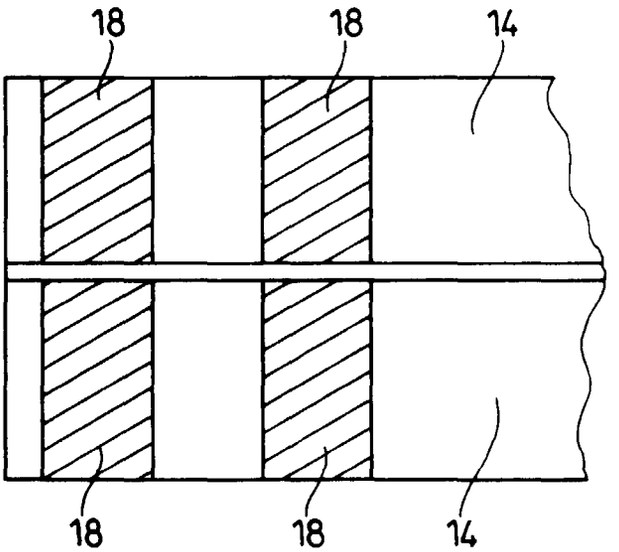


Fig. 5

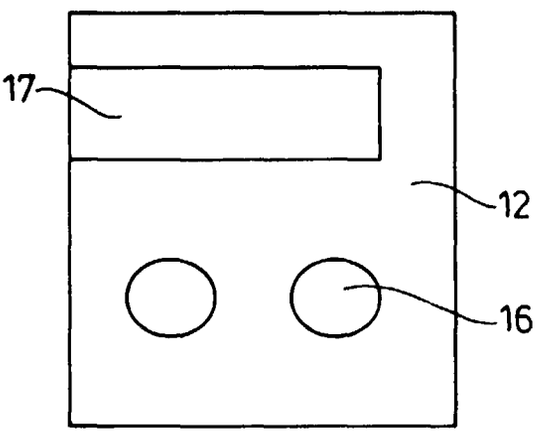
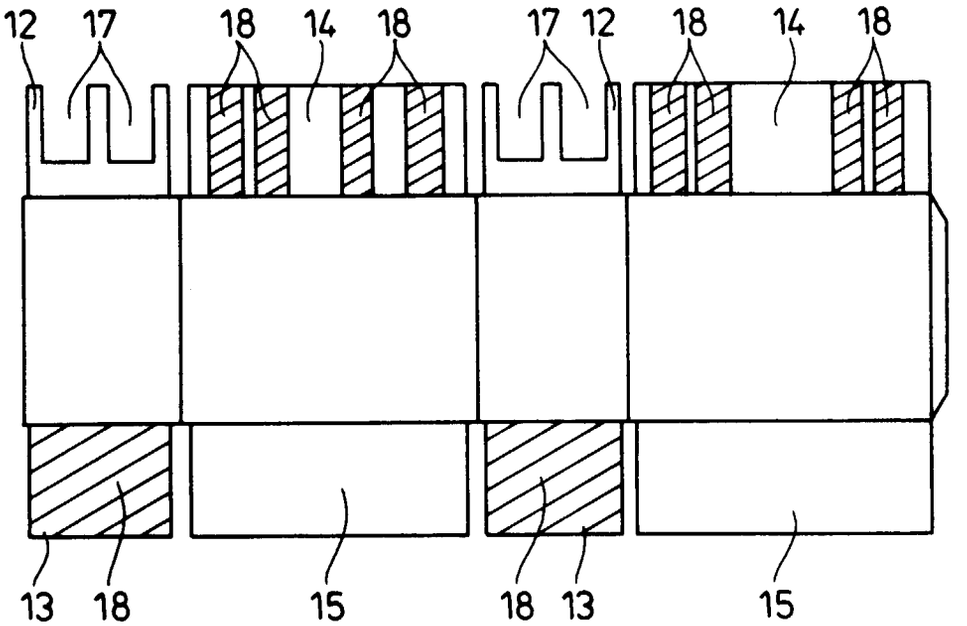


Fig. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 98 87 0062

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X Y	US 2 564 099 A (DUNNING) 14 August 1951 * column 2, line 21 - line 42; figures 1,4 * ---	1 2	B65D5/02 B65D71/00
Y	US 2 317 773 A (KAVANAUGH) 27 April 1943 * page 2, left-hand column, line 15 - line 37; figures * ---	2	
A	GB 596 500 A (KAY & ROSE) * page 2, line 77 - line 108; figures 1,2 * ---	1	
A	US 4 314 638 A (GORDON ROBERT L ET AL) 9 February 1982 * abstract; figure 1 * ---	1	
A	GB 2 264 286 A (BOXFOLDIA LTD) 25 August 1993 * abstract; figures 1,2 * -----	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)
B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	8 September 1998	Olsson, B

CATEGORY OF CITED DOCUMENTS

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