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(54) **Boxes for bottles and the like with increased resistance to bottom opening**

(57) A box for bottles and the like with increased resistance to bottom opening, comprising a die-cut sheet-like element (1) which defines lateral faces (2,3,4,5) separated by longitudinal folding lines (6). A bottom element (10) is connected to the free end of one of the lateral faces, with the interposition of a first transverse folding line (11), and ends with a closure flap (13) which is separated by a second transverse folding line (12). Bottom flaps (15) are provided at the ends of the lateral faces (2,3,4,5) which are laterally adjacent, when the box is formed, to the lateral face provided with the bottom element; the bottom flaps (15) are connected to the laterally adjacent lateral faces by means of third transverse folding lines (16) and can be folded onto the bottom. There are also locking wings (30), which protrude laterally from the bottom flaps, and locking slots (31,32), which can be engaged by the bottom wings. At least one of the locking slots (31,32) is defined at the first transverse folding line (11).

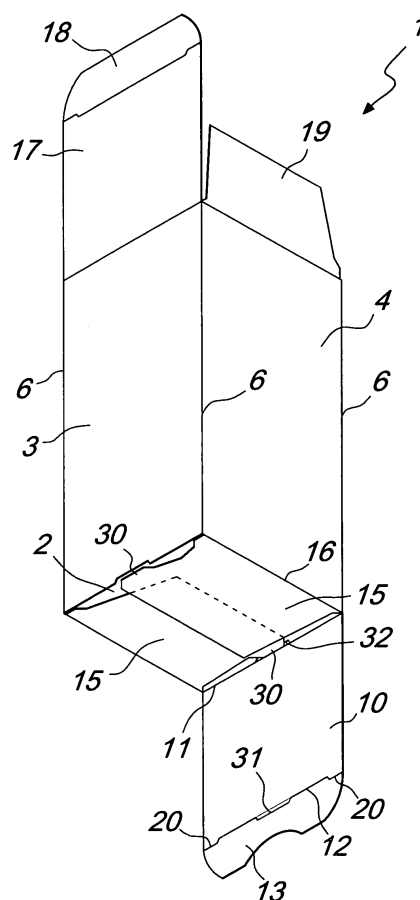


Fig. 4

Description

[0001] The present invention relates to a box for bottles and the like with increased resistance to bottom opening.

[0002] As is known, boxes are already commercially available which are used to package bottles and the like and are produced starting from a die-cut sheet generally made of paper-like material.

[0003] In the case of boxes shaped like a parallelepiped which must contain relatively heavy bottles, there is the need to improve the closure of the bottom of the box in order to prevent the weight of the bottle from accidentally causing it to open.

[0004] In order to try to solve this problem, solutions have already been provided which entail, at the bottom flaps connected to the side walls that are laterally adjacent to those from which the bottom element protrudes, tabs which are designed, when the box is in the closure position, to interlock with a slot defined substantially at the folding line between the bottom element and the closure flap inserted in the box.

[0005] With this embodiment, therefore, a further engagement occurs between the bottom element and the bottom flaps superimposed on the bottom element, increasing resistance to opening.

[0006] Although this solution has proved to be valid in many situations, it has not been able to solve the problem completely, since it does not allow to create engagement elements which are distributed uniformly so as to assuredly increase the opening resistance of the bottom element.

[0007] The aim of the invention is to solve the problem described above by providing a box for bottles and the like with increased resistance to bottom opening, which allows to optimize the engagement elements, allowing to provide a uniform distribution of the resisting elements, thus contributing to a significant improvement in the overall effectiveness of the product.

[0008] Within this aim, an object of the invention is to provide a box for bottles and the like which can be produced both with laterally adjacent bottom flaps and with superimposable bottom flaps, always allowing to distribute stresses uniformly.

[0009] Another object of the present invention is to provide a box for bottles and the like which, thanks to its particular constructive characteristics, is capable of giving the greatest assurances of reliability and safety in use.

[0010] Still another object of the present invention is to provide a box for bottles and the like with increased resistance to bottom opening which can be obtained easily starting from commonly commercially available elements and materials and is also competitive from a merely economical standpoint.

[0011] This aim and these and other objects, which will become better apparent hereinafter, are achieved by a box for bottles and the like with increased resistance to bottom opening, comprising a die-cut sheet-like element which defines lateral faces separated by longitudinal fold-

ing lines, a bottom element being connected to the free end of one of said faces, with the interposition of a first transverse folding line, and ending with a closure flap which is separated by a second transverse folding line, bottom flaps being provided at the ends of said lateral faces which are laterally adjacent, when the box is formed, to the lateral face provided with said bottom element, said bottom flaps being connected to said laterally adjacent lateral faces by means of third transverse folding lines and being foldable on said bottom, locking wings being further provided which protrude laterally from said bottom flaps and locking slots being provided which can be engaged by said bottom wings, characterized in that at least one of said locking slots is defined at said first transverse folding line.

[0012] Further characteristics and advantages will become better apparent from the description of two preferred but not exclusive embodiments of a box for bottles and the like with increased resistance to bottom opening, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a schematic view of the die-cut sheet of a box for bottles and the like, with superimposable bottom flaps;

Figure 2 is a perspective view of the initial step of the formation of the box;

Figure 3 is a perspective view of the step of the insertion of a tab of the bottom flap at the transverse folding line between the bottom element and the lateral face;

Figure 4 is a perspective view of the arrangement of both bottom flaps;

Figure 5 is a perspective view of the box with the bottom closed;

Figure 6 is an enlarged-scale sectional view, taken along the line VI-VI of Figure 5;

Figure 7 is a view of the die-cut sheet of a box with short bottom flaps which can be arranged side by side;

Figure 8 is a perspective view of the box with the bottom flaps in position;

Figure 9 is a perspective view of the box with the bottom element closed.

[0013] With reference to the figures, the box for bottles and the like with increased resistance to bottom opening comprises a die-cut sheet-like element 1, preferably made of paper-like material, which defines lateral faces 2, 3, 4 and 5 which are arranged side by side and are separated by longitudinal folding lines generally designated by the reference numeral 6.

[0014] At one end face of the die-cut sheet-like element there is a usual tab 7, which by pasting allows to define the lateral body of the box.

[0015] At the end of one of the lateral faces, and more specifically of the face 5 with reference to the accompanying drawings, there is a bottom element 10, which is

separated from the face 5 by means of a first transverse folding line 11.

[0016] The bottom element 10 is connected, by means of a second transverse folding line 12, to a closure flap 13 which can be inserted in the box in order to retain the bottom element in the closure position.

[0017] Bottom flaps, designated by the reference numeral 15, are provided on the faces that are laterally adjacent to the face 5, when the box is formed, and in the specific case at the faces 2 and 4; such bottom flaps are separated from the respective lateral faces by means of third transverse folding lines, both designated by the reference numeral 16, which, when the sheet-like element is flat, lie parallel to the lines 11 and 13 and, when the box is formed, lie at right angles to the lines 11 and 13.

[0018] The box is completed by an upper element 17 with an upper closure flap 18 which can be superimposed, in a per se known manner, on the upper flaps, both of which are designated by the reference numeral 19 and protrude from the lateral faces that lie opposite the ones provided with the flaps 15.

[0019] At the second folding line 12 usual end notches 20 are provided, which allow to mate with the coupling teeth of the flaps 15 so as to increase closure stability.

[0020] In order to achieve increased resistance to opening of the bottom at the flaps 15 which, with reference to Figures 1 to 6, are of the type which can be mutually superimposed, lateral wings 30 are provided, which once folded into the closure position, can be inserted in a front locking slot 31, which is defined at the second folding line, i.e., in the folding line defined between the bottom element 10 and the closure flap 13.

[0021] Moreover, and this is a peculiar feature of the invention, at least one of the wings 30 is inserted in a rear locking slot 32 which is defined at the first folding line 11 provided between the bottom element 10 and the lateral face 5.

[0022] In practical execution, it is possible to provide, for both bottom flaps, two wings which engage respectively a front slot 31 and in a rear slot 32.

[0023] In this manner, as shown by Figures 4 and 5, there are locking points which are distributed uniformly and more precisely there is a continuous supporting surface on four regions arranged in a cross-like configuration, and specifically the locking slots distributed respectively at the front and at the rear, and the lateral folding lines of the closure flaps.

[0024] With reference to Figures 7 to 9, in the case of short closure flaps, which do not overlap but are arranged side by side and are designated by the reference numeral 15' in Figure 7, it is possible to provide, for each flap, wings 30' on both sides of the closure flap 15' so that each flap engages the rear locking slot 32, i.e., the slot arranged on the folding line between the lateral face and the bottom element.

[0025] It is also possible optionally to provide, for each closure flap 15', a front slot and a rear slot, and it is also possible with short flaps to couple one flap with the front

slot and the other flap with the rear slot.

[0026] In this case also, there are four distinct supporting points of the bottom element 10 which in practice are arranged in a cross-like configuration and are provided by the coupling of the lateral tabs at the folding line between the bottom element and the closure flap, and the slot provided between the folding line between the bottom element and the lateral faces, in addition to the folding lines constituted by the third folding lines of the individual flaps.

[0027] With the solutions described above it is possible to bear the weight much more easily, since an interlocking coupling is provided at a region where in practice there is substantially no leverage in the interlocking point.

[0028] The wing which is interlocked at the first transverse folding line in practice has to bear only a relatively low shearing stress and minimal flexural stresses, since the lever arm is substantially nonexistent.

[0029] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0030] All the details may further be replaced with other technically equivalent elements.

[0031] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements.

[0032] The disclosures in Italian Patent Application No. MI2006A000171 from which this application claims priority are incorporated herein by reference.

[0033] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A box for bottles and the like with increased resistance to bottom opening, comprising a die-cut sheet-like element which defines lateral faces separated by longitudinal folding lines, a bottom element being connected to the free end of one of said faces, with the interposition of a first transverse folding line, and ending with a closure flap which is separated by a second transverse folding line, bottom flaps being provided at the ends of said lateral faces which are laterally adjacent, when the box is formed, to the lateral face provided with said bottom element, said bottom flaps being connected to said laterally adjacent lateral faces by means of third transverse folding lines and being foldable on said bottom, locking wings being further provided which protrude laterally from said bottom flaps and locking slots being provided which can be engaged by said bottom wings, **characterized in that** at least one of said locking

slots is defined at said first transverse folding line.

2. The box according to claim 1, **characterized in that** said first and second transverse folding lines are substantially parallel to each other. 5
3. The box according to one or more of the preceding claims, **characterized in that** each of said bottom flaps is provided with wings which can be inserted respectively in a front locking slot defined on said second transverse folding line and in a rear locking slot defined on said first transverse folding line. 10
4. The box according to the preceding claims, **characterized in that** when said bottom flaps are superimposable the wing connected to a bottom flap can be inserted in said front locking slot and the wing defined on the other bottom flap can be inserted in said rear locking slot. 15
20
5. The box according to one or more of the preceding claims, **characterized in that**, when said closure flaps are arranged side by side, said wings are provided at both sides of the corresponding closure flap and are inserted in slots defined respectively at said first closure line and at said second closure line. 25
6. The box according to one or more of the preceding claims, **characterized in that** when said closure flaps are short said slots accommodate side by side the wings of opposite closure flaps. 30
7. The box according to one or more of the preceding claims, **characterized in that** said wings are adapted to define four separate supporting points for the bottom element. 35

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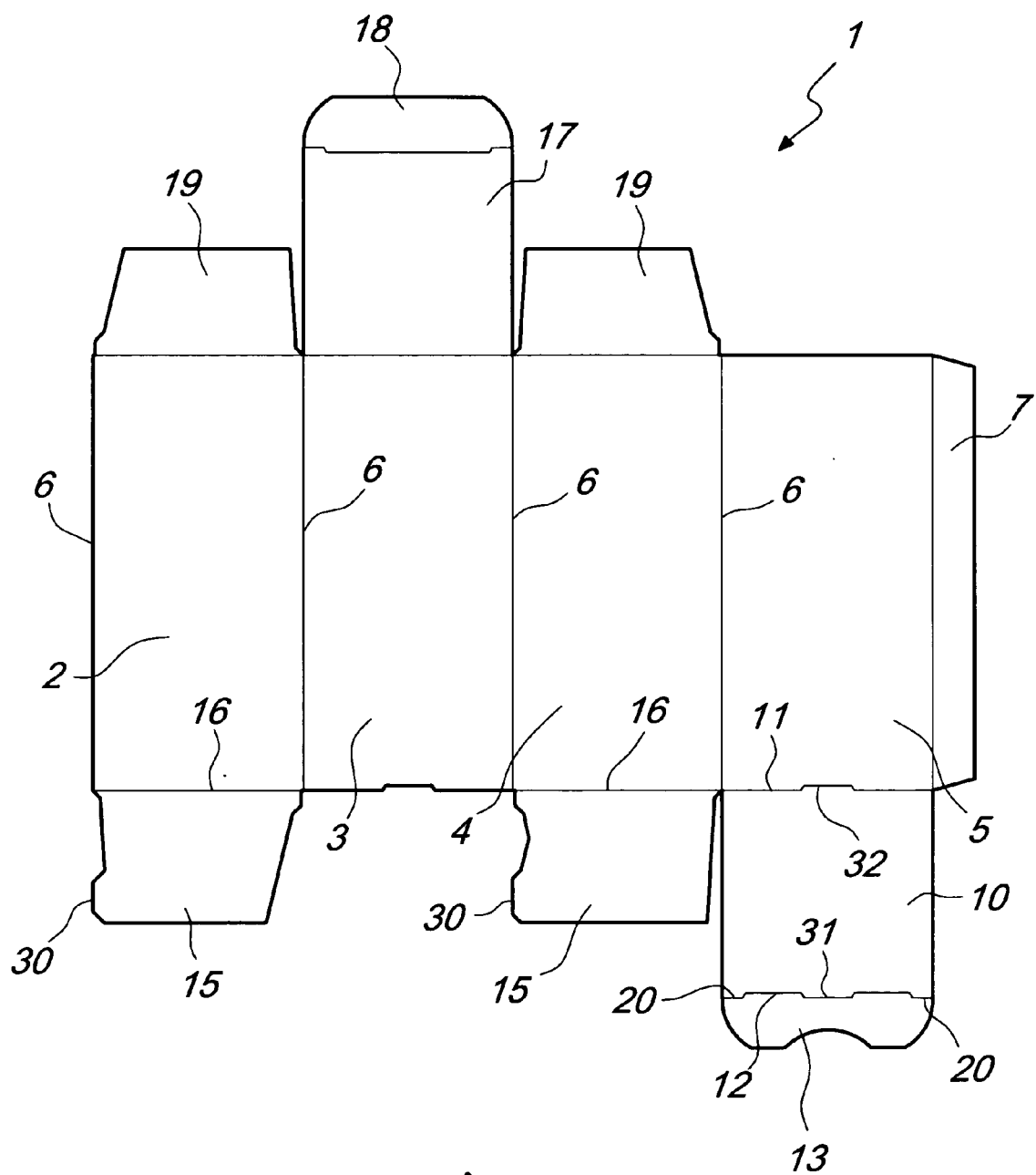


Fig. 1

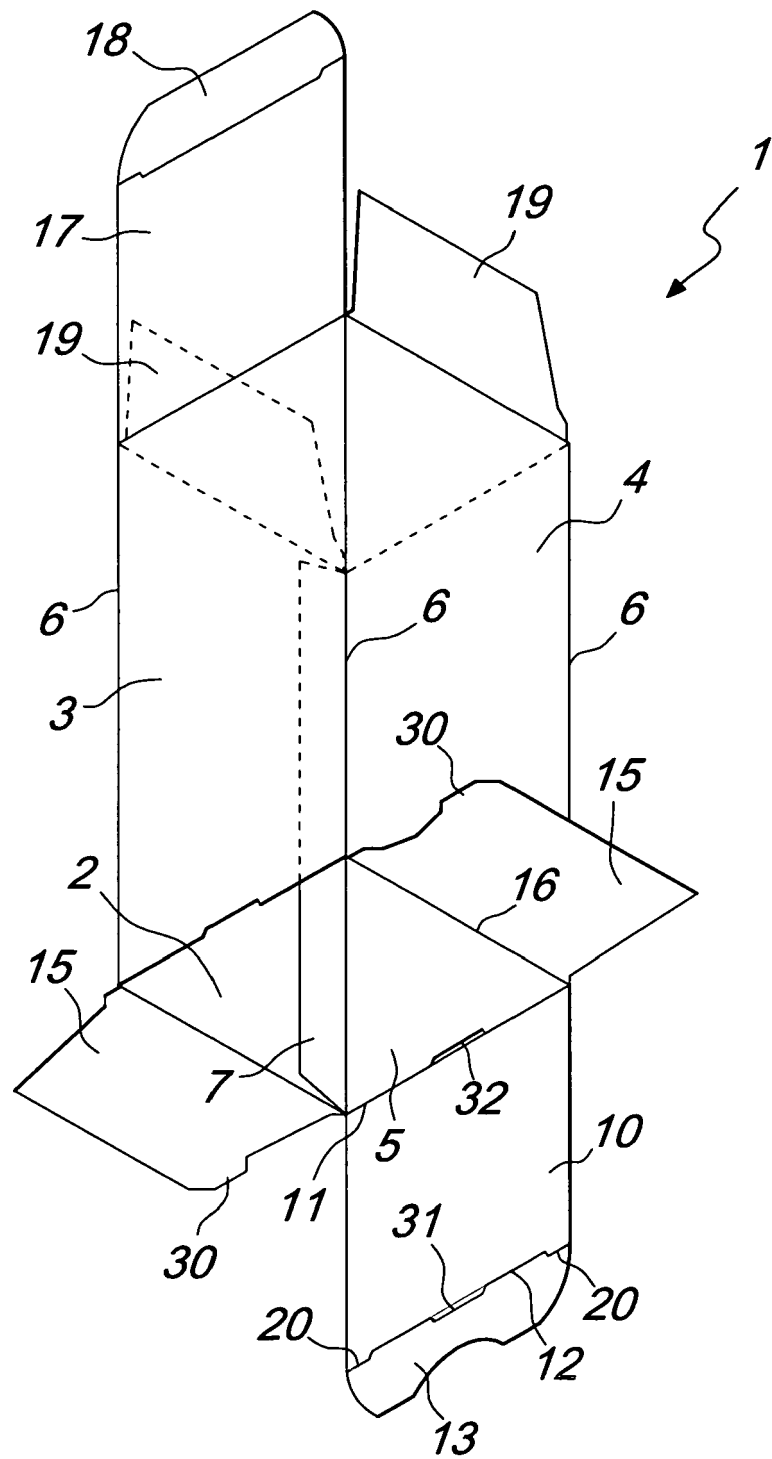


Fig. 2

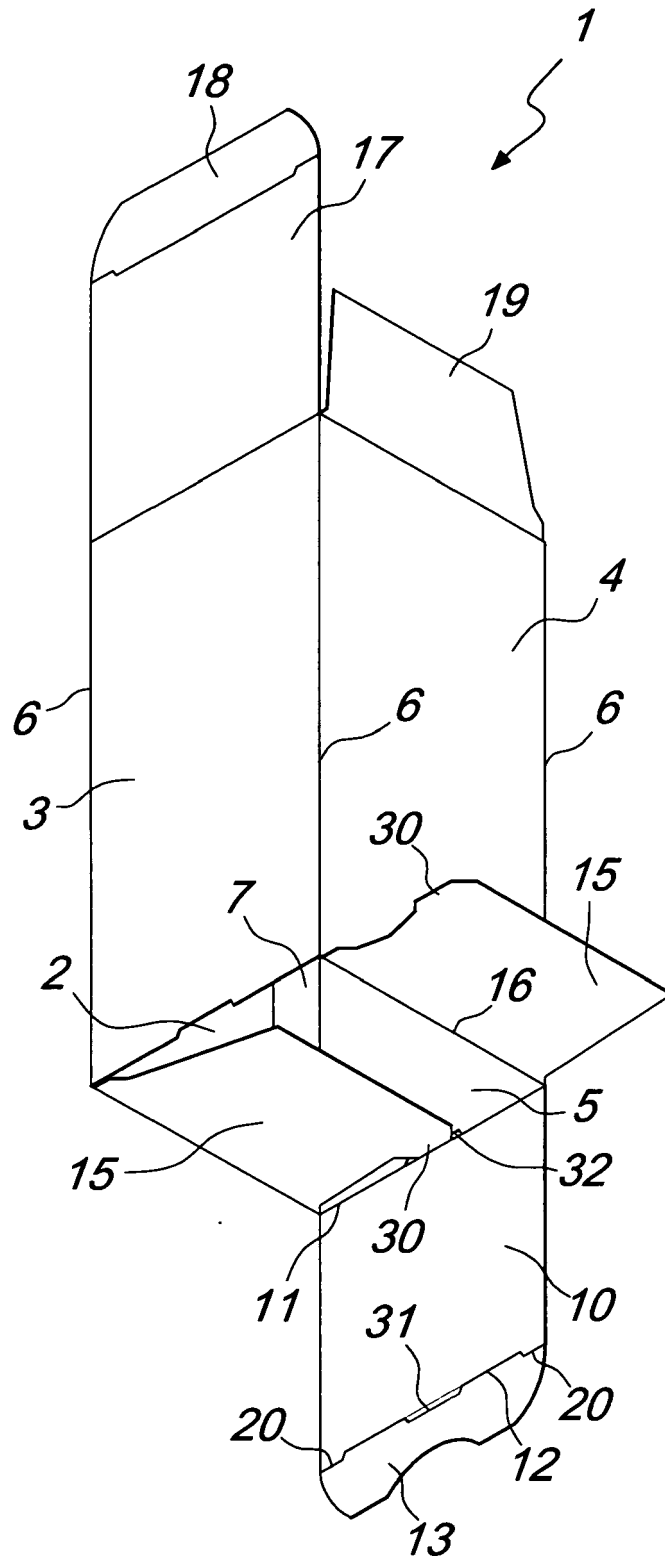


Fig. 3

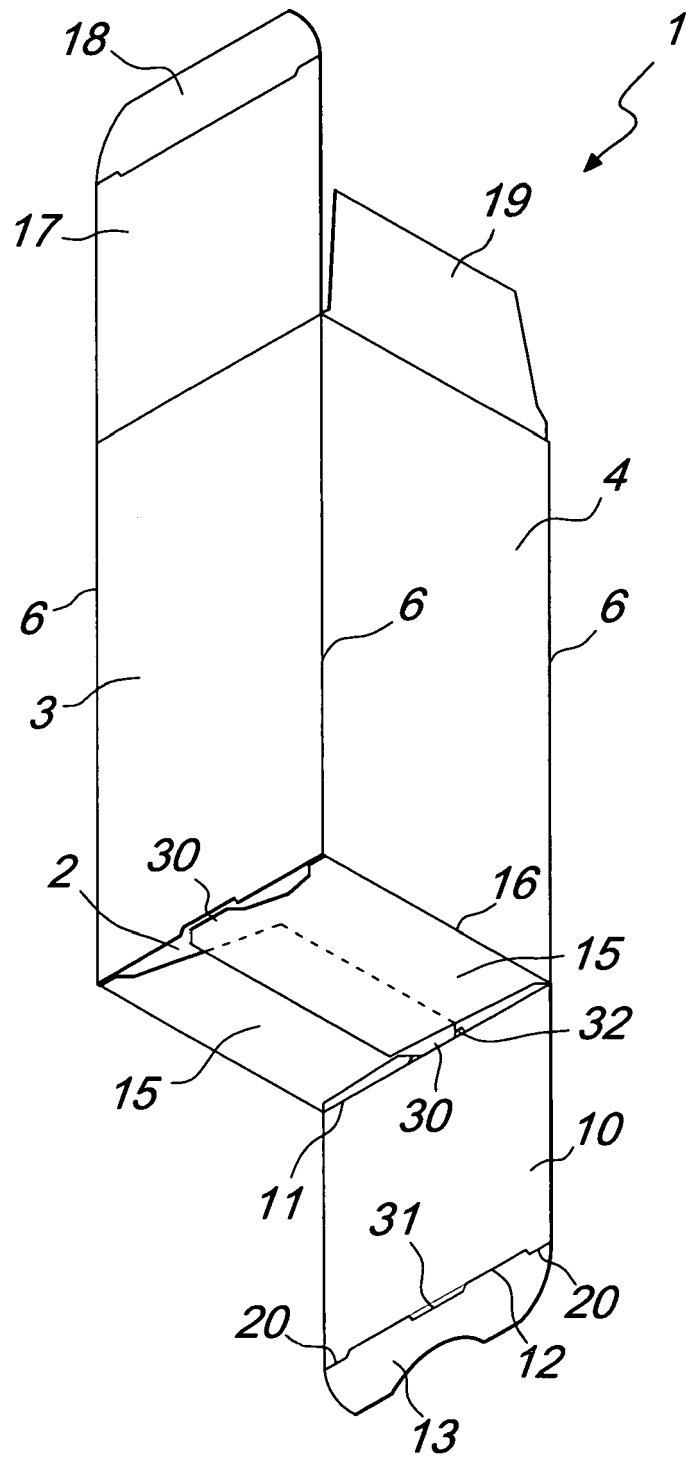


Fig. 4

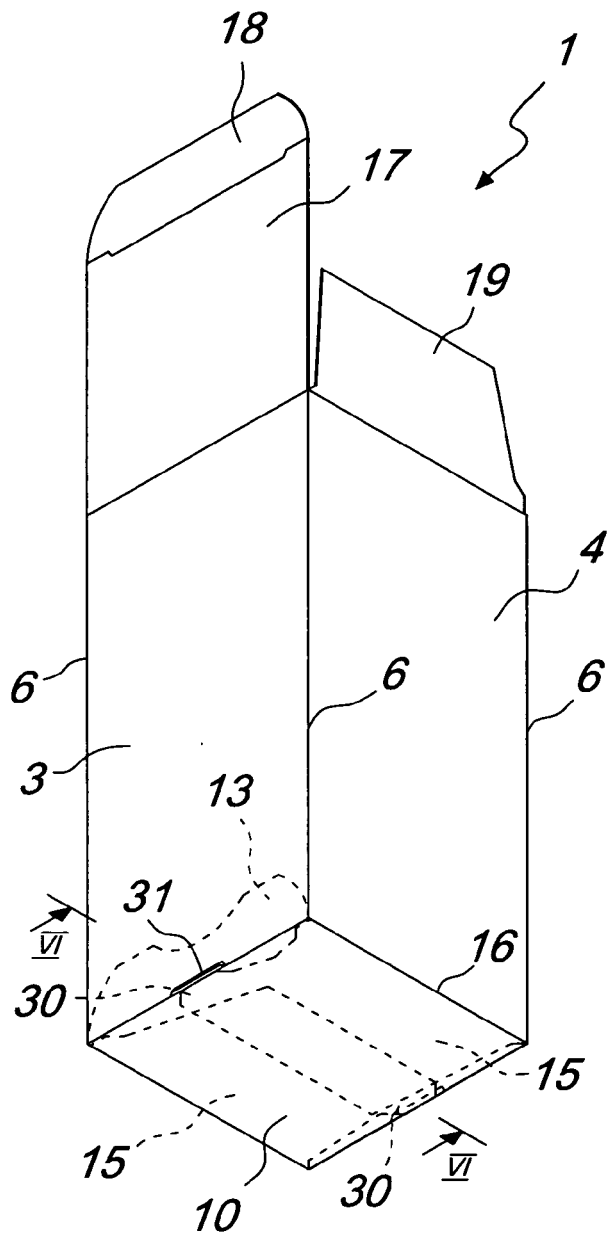


Fig. 5

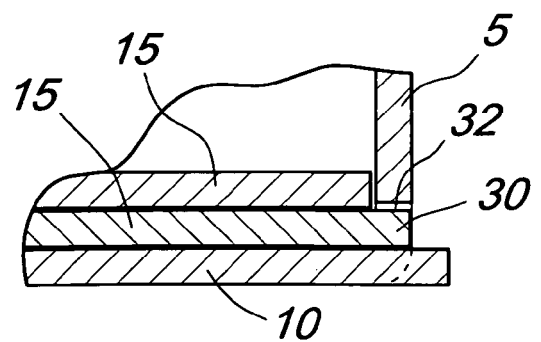


Fig. 6

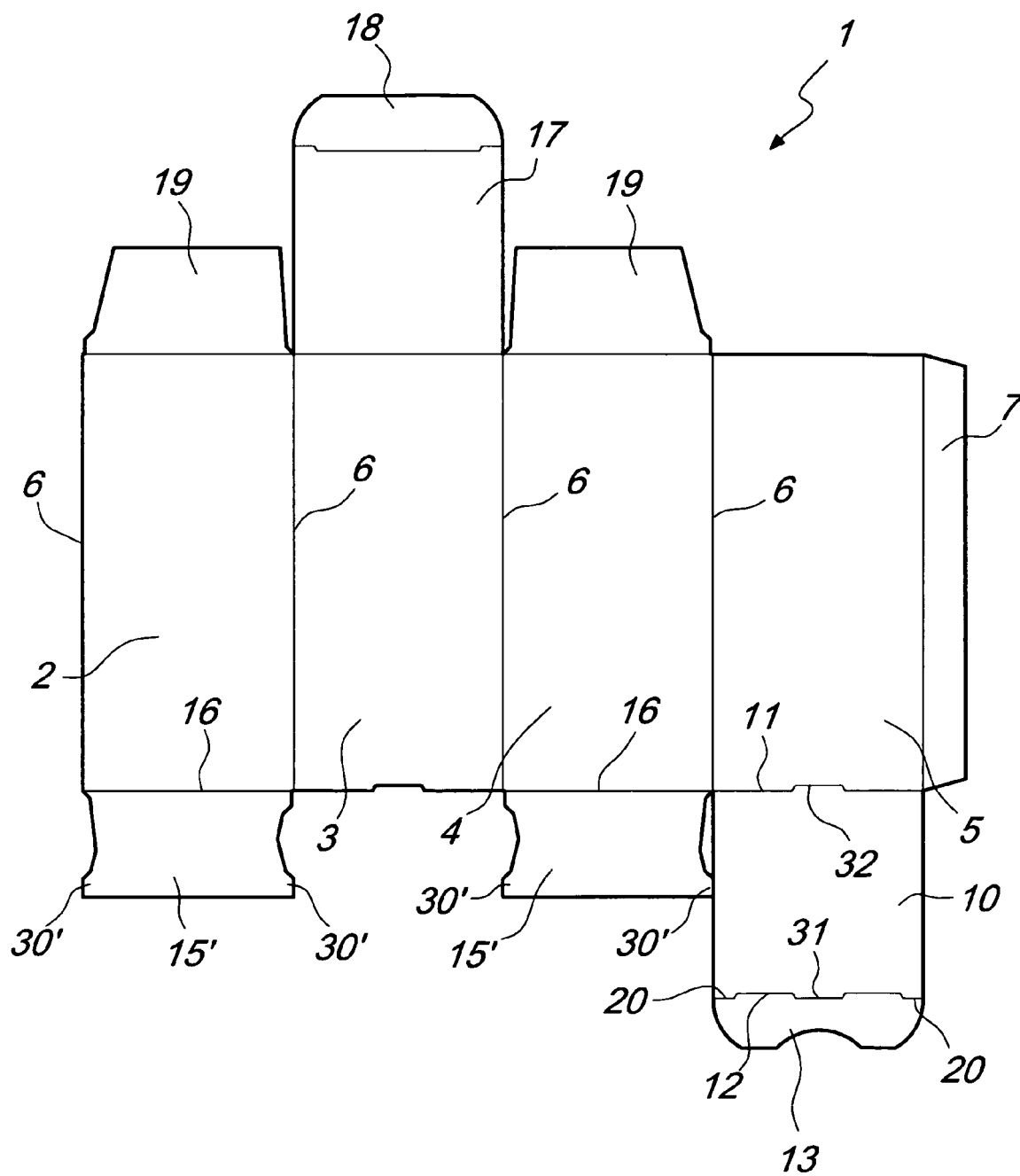


Fig. 7

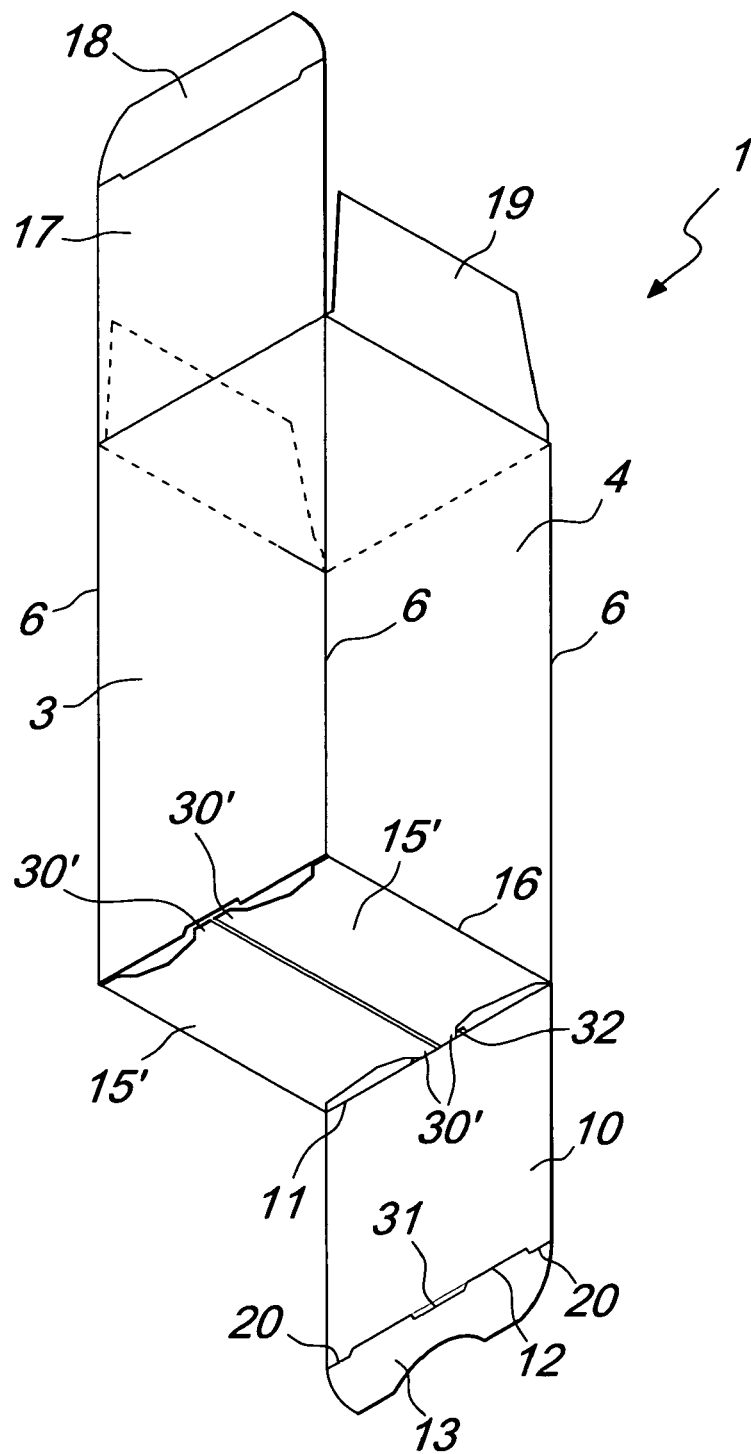


Fig. 8

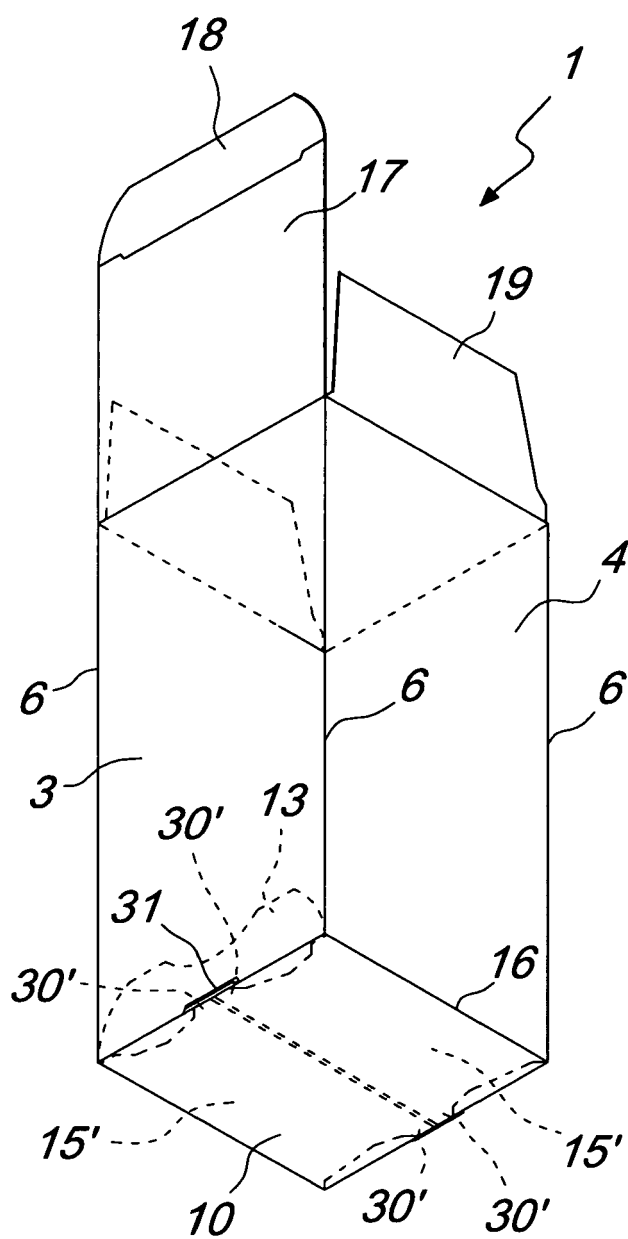


Fig. 9



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EUROPEAN SEARCH REPORT

Application Number
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Place of search		Date of completion of the search	Examiner
Munich		22 May 2007	Bevilacqua, Vincenzo
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EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 07 00 1507

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