



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
07.03.2001 Bulletin 2001/10

(51) Int Cl.7: **B65D 5/64, B65D 5/32**

(21) Application number: **99830548.6**

(22) Date of filing: **06.09.1999**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE
 Designated Extension States:
AL LT LV MK RO SI

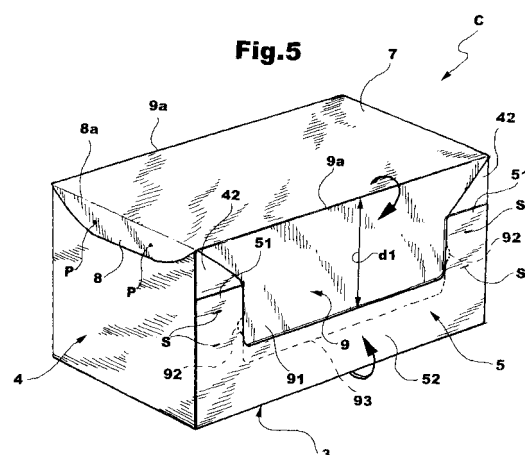
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(54) **A lid for a cardboard carton box and a cardboard box carton associated therewith**

(57) A lid of sheet material which can be fitted to a base which includes corner formations (42) which define, for each pair of adjacent formations, a first and a second pair of sides (4, 5) with the sides of the said second pair (5) having end arms (51) which can be folded against and fitted to a respective pair of the said corner formations (42). The lid includes a central panel (7) from which a first pair (8) and a second pair (9) of respective opposite sides extend for cooperation with the said first and second pairs of sides (4, 5) of the base respectively. The respective sides of the said first pair (8) are foldable and fixable against the sides (4) of the said first pair. The respective sides of the said second pair (9) have projecting terminal parts (92, 93) for cooperation by hooking onto respective portions of the sides of the second pair (5).



Description

[0001] The present invention relates to the sector of cardboard packaging and in particular to a lid for a cardboard carton according to the preamble of Claim 1.

[0002] Cardboard cartons of this type are used, for example, to carry goods such as beverages contained in plastic cups closed by a perforable foil from the production site to the point of sale (especially to supermarkets and other large retail sites). Products of this type are formed into groups (comprising six or twelve products in rows, for example) and these groups are then stacked like bricks to form more complex structures (two or three layers of several adjacent groups, for example) which are then packaged in a cardboard carton.

[0003] The latter is preferably constituted by a base part with sides, for receiving the products. The base part is then closed by a lid generally constituted by a central panel (which forms the top surface of the carton) from which side walls extend to partly surround the side walls of the base and are secured to the latter by spots of hot-melt glue.

[0004] Substantially similar cartons can of course be used for other products, including non-food products.

[0005] However, the use of such cartons does involve some drawbacks, both structural and functional.

[0006] From a structural point of view, some packaging cartons turn out to be rather complicated at times because they require the application of somewhat numerous spots of adhesive in order to form the base, to close the lid and to couple them.

[0007] Another disadvantage consists in the fact that cartons of the above type are often superimposed to form stacks, thereby forming assemblies of considerable dimensions and height, which are then stored and transported on pallets. This leads to the cartons, in particular those in the lower positions, being subjected to considerable mechanical stress, with the result that they may be deformed, especially outwardly.

[0008] The deformed portions may project from the assembly of cartons loaded on the pallet, with the risk of causing them to catch on adjacent stacks and/or on external obstacles, thereby risking being torn.

[0009] An additional disadvantage consists in the fact that, once the carton has been opened and the products contained therein have been removed, both the base and the lid constitute three-dimensional bodies which, by virtue of the heavy application of adhesive in order to ensure that they are solid and strong, are difficult, or at least not easy to flatten for disposal. In fact, in some cases, in order to be flattened, the base and/or the lid require tough action, which often results in the part being torn, thereby dispersing fragments or residues.

[0010] The object of the present invention is to provide an arrangement able to overcome the aforesaid disadvantages.

[0011] This object is achieved according to the present invention by providing a lid having the charac-

teristics claimed in the claims which follow. The invention also relates to the carton to which the said lid is fitted.

[0012] The invention will now be described, purely by way of non-limitative example, with reference to the appended drawings, in which:

Figures 1 and 2 illustrate two successive steps in the sequence of operations which form a base for coupling with a lid of the invention;

Figure 3 illustrates in detail the structure of a lid of the invention,

Figure 4 illustrates schematically two successive steps in the operation for coupling the lid of Figure 3 to a base of a type illustrated in Figures 1 and 2, and

Figure 5 shows the carton obtained as a result of this operation.

[0013] Before a detailed examination of an embodiment of the invention, it should be stated once again that the invention is of entirely general application. In the introduction of the present description, reference was made to a possible application to the packaging of beverages sold in cups closed by foil seals: however, the invention could be used in numerous other packaging applications, both dealing with food products, such as a bakery goods or fruit and vegetables, or with other products such as detergents and similar products.

[0014] It must also be said that the assembly of parts, indicated 1 in Figures 1 and 2, which constitutes - as will be seen more clearly later - the base of the carton C, illustrated as a whole only in Figure 5, corresponds to an arrangement which is known per se and in use in the field of cardboard packaging.

[0015] In substance, the base 1 is preferably constituted of a single piece of sheet material (typically cardboard, such as corrugated cardboard, especially in cases in which the carton is required to have a degree of mechanical strength) in which a rectangular central panel or base 3, a pair of sides or shorter walls 4 and a pair of sides or longer walls 5 can be distinguished.

[0016] The terms "shorter" and "longer" refer to the relative dimensions of the walls, which are significantly different since the central panel 3 is rectangular.

[0017] The central panel could, of course, also be square, and would then have side walls of about the same dimensions. The shape could also be rectangular but complementary, as it were, to that illustrated, that is with the two sides constituting the shorter sides becoming the longer sides and, vice versa, those shown as the longer sides becoming the shorter. In such a case, the structure of the sides 4 and 5 would be reversed, without however having any appreciable effect on the scope of the invention.

[0018] With a more detailed examination of the structure of the base 1, it will be noted that each of the sides 4 is constituted by a respective square or rectangular

central main portion 41, with two edge flaps folded over on themselves and glued by their distal end to the main portion 41. At each lateral edge of the side 4 (and at each vertical corner of the base 1 as seen in Figure 2) this produces a corner element or column 42 with an approximately triangular section and reinforcing projections 43 which extend both along the shorter edges and along the longer edges of the bottom 3.

[0019] As already stated, all the above follows criteria known per se, which do not require any further description here.

[0020] In the embodiment illustrated, the sides 5 are generally U-shaped. They therefore comprise two lateral arms 51, each of which is in contact, when the respective side 5 is folded against the corner formations 42, with one of the respective corner formations 42 of the pair between which the respective side 5 extends. The two lateral arms 51 of the U shape are connected to each other by a main portion 52 which is connected in turn by a fold line to the respective edge (in this case one of the longer edges) of the central panel 3.

[0021] The main portion 52 is preferably formed, again according to known criteria, as a double structure - with the obvious aim of increasing strength and rigidity - by folding over a distal portion 53 against the proximal portion connected to the central panel 3.

[0022] Once the corner formations 42 have been formed, and the portions 53 have been folded against the parts 52, the sequence of operations to assemble the base 1 calls for the sides 4 to be arranged perpendicular to the central panel 3 and also the sides 5.

[0023] In prior art arrangements, the base thus formed is next consolidated in its final assembled shape, which provides a concave configuration for receiving the intended products, by the application of sealing points, typically spots of hot-melt glue.

[0024] The lid 6 shown in detail in Figure 3 also comprises a central panel 7, which is rectangular in the embodiment illustrated. The dimensions of the central panel 7 are preferably identical, or substantially identical to those of the central panel 3 of the base 1, since these two elements are intended to constitute the base surface and the top surface of the finished carton C. It is conceivable, however, that the dimensions of the central panel 7 could be greater or smaller than those of the central panel 3, thereby giving the carton C the general shape of a truncated pyramid, either narrowing or broadening at the top.

[0025] The central panel 7 of the lid 6 also has two sides 8 along a first pair of edges (the shorter edges in the embodiment illustrated) and two other sides 9 along the other pair of edges (the longer edges in the embodiment illustrated).

[0026] The sides 8 are preferably shaped somewhat like an eyelid, in the sense that their dimension measured from the fold line 8a connecting them to the central panel 7 is minimal (preferably nothing) at the corners of the central panel 7 and increases gradually (preferably

symmetrically with respect to their central region) to a maximum which is preferably reached around mid way between the ends of the side or corners and the mid region of the side.

[0027] Construction experts will immediately appreciate that the aforesaid shape is closely similar to that of a girder (in a bridge, for example). This shape is designed to provide the advantage of maximum resistance to stress (directed primarily vertically and thus in the plane of the side 8 when it is folded against the box, as shown in Figure 5) in the central portion.

[0028] The sides 9, on the other hand, are generally tapered from their proximal region 90, joined to the central panel 7 along a fold line 9a.

[0029] The aforesaid tapered shape preferably gives the proximal portion 90 an approximately trapezoidal shape, with the distal portion 91 of the side 9 extending as an approximately rectangular shape from the shorter side of the said trapezoid. One or more tabs 92 project in a transverse direction from the distal portion 91. The function of these tabs will be explained later.

[0030] In Figure 3, the distance between the fold line 9a and the edge 93 of the distal portion 91 of each side 9 of the lid 6 is indicated d. The choice of the value of this distance d will also be discussed in detail later.

[0031] The sequence of operation for the application of the lid 6 of the invention to the base 1 follows criteria which do not differ substantially from those used to fit lids of the prior art.

[0032] In substance, the products to be packaged (not explicitly shown in the drawings) are arranged in the base 1 in one or more layers on the central panel 3, for example when the base 1 is still in the condition shown in Figure 2, that is with the sides 5 still open, away from the corner formations 42.

[0033] The products could, of course also be stacked onto the central panel 3 at an earlier moment, before the sides 4 are folded upwards, that is even before they are arranged in the position shown in Figure 1.

[0034] In principle, it would be possible to arrange the products on the central panel 3 when the blank to be used to form the base 1 is entirely, or substantially entirely flat, that is before the folding of the corner formations 42.

[0035] In any case, the actual moment when the products are placed in the base 1 is not critical to the scope of the invention.

[0036] Starting with a condition such as that shown in Figure 2 (independently of the specific condition of the base 1 when it has received the products) the lid 6 is fitted by arranging it over the base 1, substantially in the condition shown in Figure 3. The central panel 7 thus rests on the upper ends of the corner formations 42 (and on the upper edges of the mid-portions 41 of the sides 4) with the sides 8 projecting over the upper edge of the said central portions 41 and the sides 9 projecting from the fold line 9a.

[0037] The sides 8 of the lid 6 are then turned down

against the central portions 41 of the sides 4 of the base 1. These sides 8 are then secured in this position by the application, for example, of *staples* or of beads of an adhesive such as hot-melt glue.

[0038] The sides 9 are also folded back against the carton C in two movements illustrated schematically in an ideal sequence, to the left and to the right of Figure 4 respectively. It must be emphasized that this sequence is ideal since the single movements described hereafter should preferably be carried out simultaneously and symmetrically on the two sides of carton C.

[0039] In practice, the two movements are as follows:

- folding the sides 9 downwards so that they are aligned vertically with the edges of the central panel 3: as a result of this operation, the ends of the proximal portions 90 of each side 9 (which are generally triangular owing to the trapezoid shape of the proximal portions 90) are in contact with the upper ends of the two corner formations 42 between which the side extends; and
- subsequently folding the sides 5 upwards so that the arms 51 are in contact with the corner formations 42.

[0040] The overall result thus achieved is the closure of the carton in the manner illustrated in Figure 5.

[0041] Folding of the sides 5 upwards (to the right in Figure 4) has a dual effect.

[0042] Firstly, as can be seen more clearly in the lower right-hand of Figure 5, by folding upwards, the main portions 52 of the sides 5 secure the respective distal portions 91 of the sides 9. This result is achieved by choosing the distance d (in Figure 3) between the fold line 9a and the edge 93 so that it is at least slightly greater than the distance (indicated d1 in Figure 5) between the fold line 9a and the upper edge of the main portion 52 of the associated side 5.

[0043] As an alternative to, or in addition to the arrangement described above, the sides 5 can be made to secure the sides 9 against the carton by providing the sides 9 with tabs 92, preferably projecting from their distal portions 91, which can be inserted (as a result of the folding mechanism shown in Figure 4) between the corner formations 42 of the base 1 and the lateral arms 51 of the corresponding folded sides 5.

[0044] In this manner, the sides 9 can be secured against the carton simply by being hooked to the sides 5 of the base 1, without the need for fixing points (by staples or beads of adhesive, for example).

[0045] In order to achieve this result, it is sufficient to secure (typically with the application of beads of glue) the lateral arms 51 of the sides 5 and the corresponding corner formations 42, that is two portions of the base 1.

[0046] The overall result of this sequence of operations is the carton indicated C in Figure 5.

[0047] It will be appreciated that the presence of the lid 6 gives this carton various advantages over packaging

of the prior art.

[0048] Firstly, a cardboard carton is provided which is both simple and very robust. In particular, it provides considerable resistance to mechanical stress on the sides 8 which, thanks to their girder-like conformation, do not tend to bulge outwardly, even when the carton is subjected to considerable vertical stress.

[0049] At the same time, the need for fixing elements or points is reduced to a minimum, both in the case of the lid 6 alone and in the carton C as a whole. In practice, with the exception of the points fixing the sides 8 to the sides 4 (points which are schematically indicated P in Figure 5: it must be remembered that this illustration is purely schematic, since the points in question are applied to the face of the side 8 opposite that which is viewed, and are thus not per se visible), the respective portions of the lid 6 of the invention have no attachment elements or points.

[0050] As a result, once the sides 8 are raised and separated from the sides 4 in order to open the box, the lid 6 consists once again of a simply folded element of sheet material and is thus easy returned to its flat state for disposal. This with no need for detaching any points, with the possible risk of tearing.

[0051] With regard to the base 1, the overall configuration thereof is no different from that of similar bases of the prior art, the arrangement of the invention enables the need for closure points to be kept to a minimum. These can be simply beads or rings of beads or strips of hot-melt adhesive material, such as those indicated S in figure 5 alone (it will be recalled, once again, that this illustration is schematic, since the said connection elements S are applied to the surfaces which are hidden from outside view), arranged over the area where the tabs 92 are inserted between the corner formations 42 and the arms 51 of the sides 5.

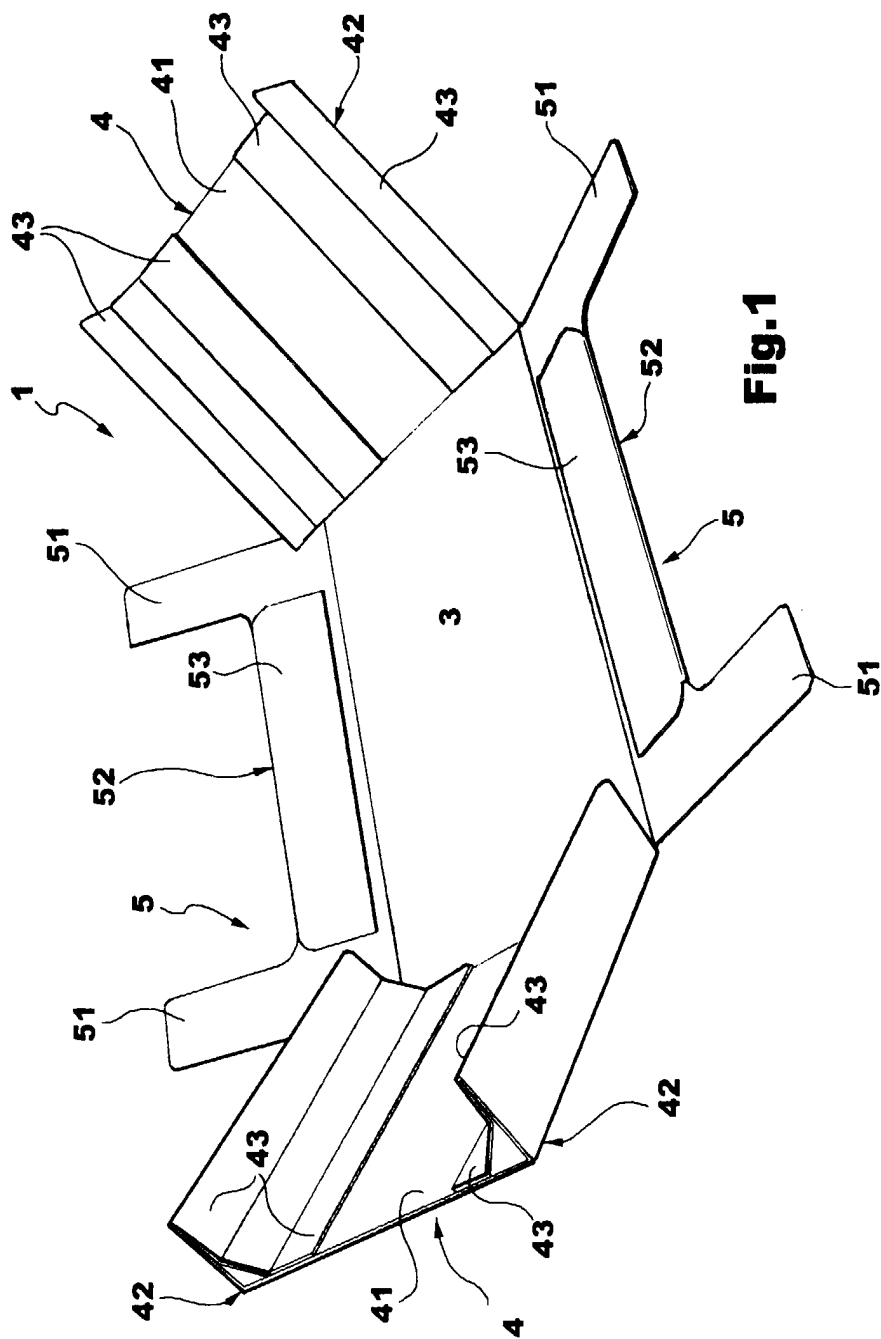
[0052] As a result, operations for the disposal of the base 1 are also considerably simplified, once the lid has been returned to its original flat state. All that is required is to "break" the fixing areas S in order to be able to flatten the base 1 (after previously flattening the corner portions 42) and possibly dispose of it.

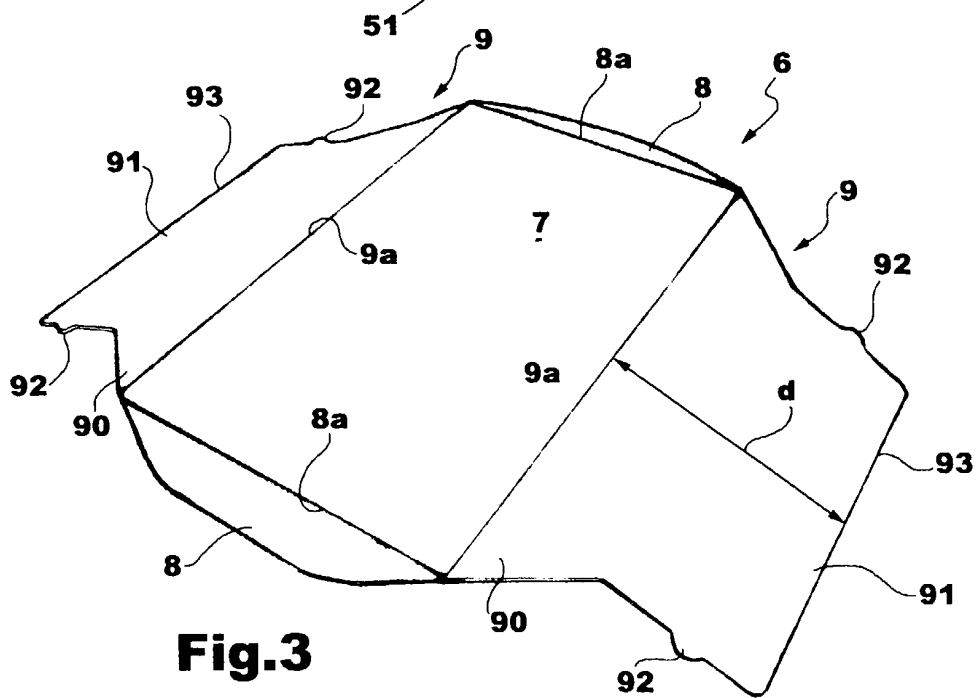
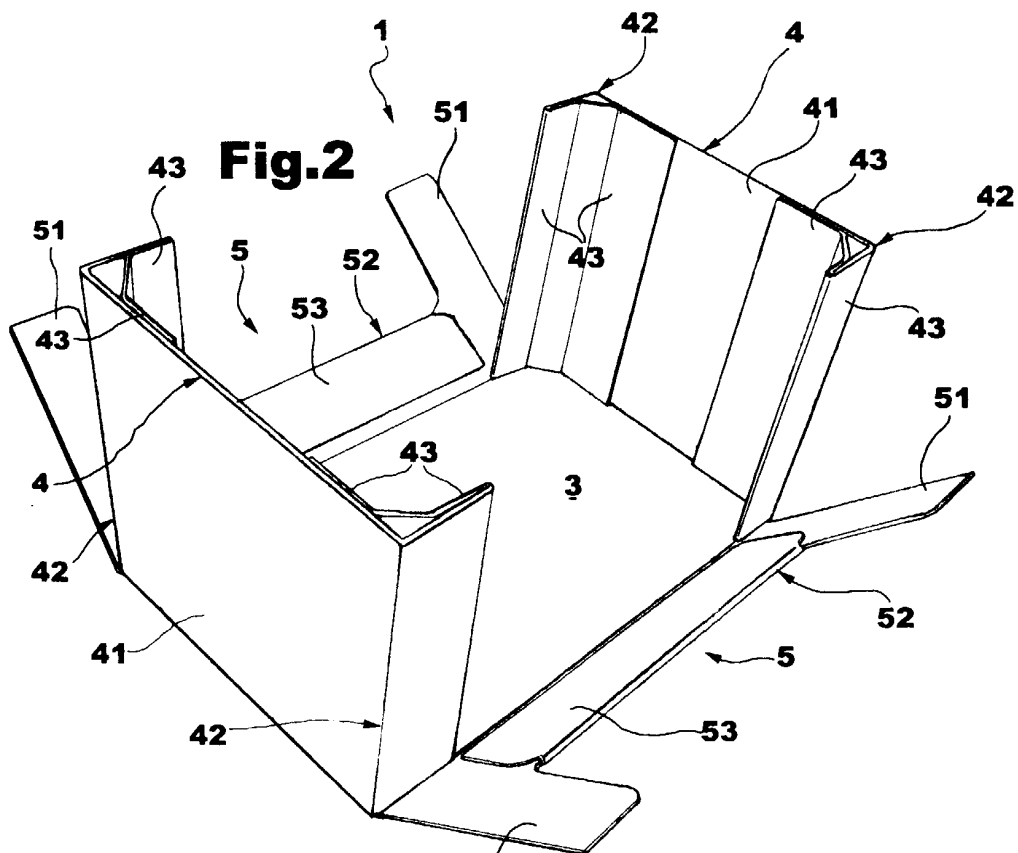
[0053] Naturally, the principle of the invention remaining the same, manufacturing details and embodiments may vary widely from those described and illustrated, without departing thereby from the scope of the present invention, as claimed in the appended claims.

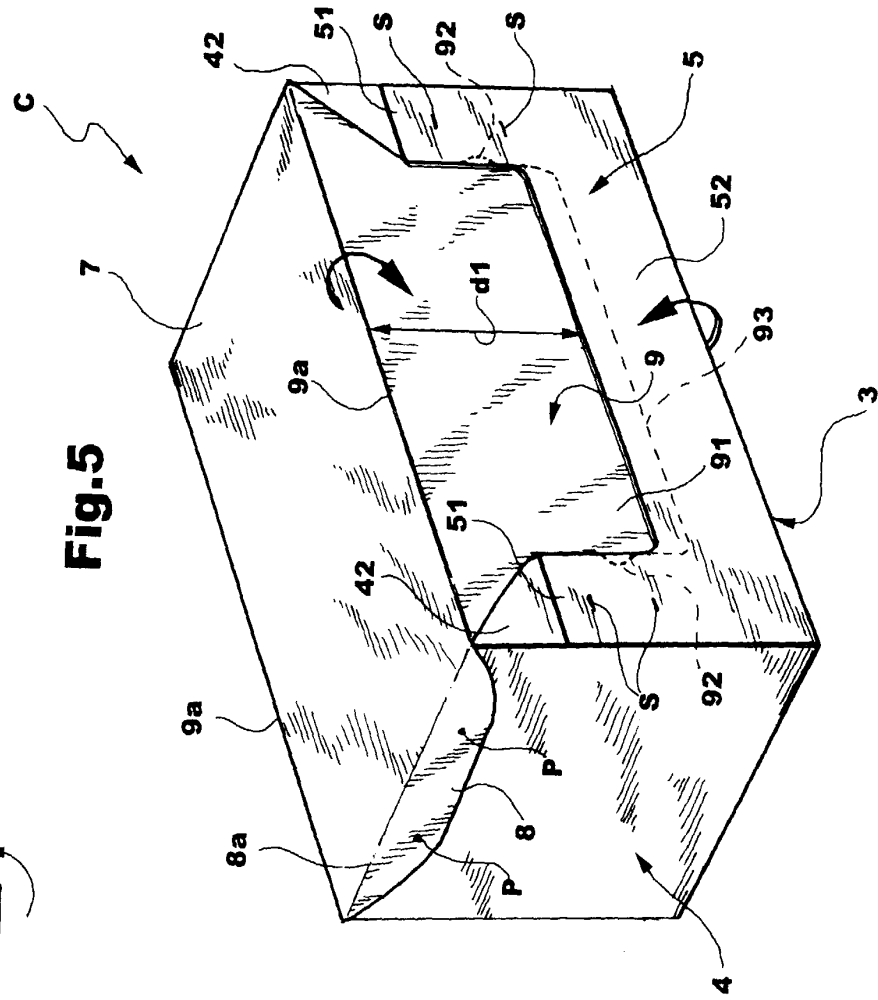
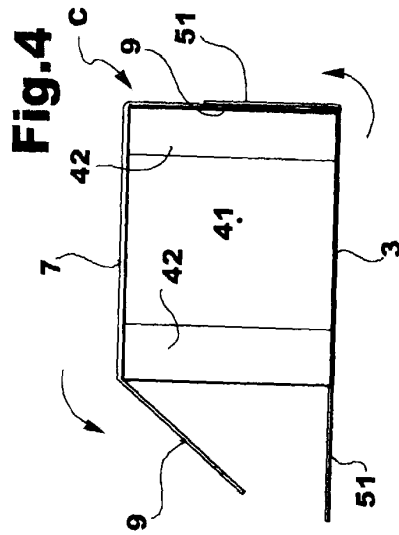
Claims

1. A lid of sheet material for application to a bases (1) including corner formations (42) having, for each pair of adjacent corner formations, an associated first pair (4) and second pair (5) of opposite sides, with the sides of the said second pair (5) having end arms (51) which can be folded against and fixed to a respective pair of the said corner formations (42),

- the said lid (6) being characterised in that it includes a central panel (7) from which extend a first (8) and second (9) pair of respective opposite sides for cooperation, respectively, with the said first (4) and second (5) pair of sides of the said base (1) and in that: 5
 - the respective sides of the said first pair (8) are foldable against and connectable to the sides (4) of the said first pair, and
 - the respective sides of the said second pair (9) have projecting parts (92, 93) for cooperation by simply hooking with respective parts (51) of the sides of the said second pair (5). 10
2. A lid according to Claim 1, characterised in that the respective sides of the said first pair of sides (8) are generally shaped like a girder. 15
3. A lid according to Claim 2, characterised in that the height of the respective sides of the said first pair of sides (8) increases from a minimum value at the ends to a maximum value in the central region. 20
4. A lid according to Claim 2 or Claim 3, characterised in that the respective sides of the said first pair (8) are generally shaped like an eyelid. 25
5. A lid according to any Claim from 1 to 4, characterised in that the said projecting parts include at least one appendage (92) extending in a generally transverse direction from the respective side of the said second pair (9); the said at least one appendage (92) being insertable between one of the corner formations (42) and an end arm (51) of one of the sides of the said second pair (5) folded against and fixed to it. 30 35
6. A lid according to any one of the preceding Claims, characterised in that the said projecting parts include distal edges (93) of the said respective sides of the said second pair (9) for insertion inside the sides of the said second pair (5). 40
7. A lid according to either preceding Claim 5 or Claim 6, characterised in that the said respective sides of the said second pair (9) include: 45
- a proximal portion (90) with a generally tapered shape, and
 - a distal portion (91) bearing the said projecting parts (92, 93). 50
8. A lid according to Claim 7, characterised in that the said distal portion (91) is of substantially rectangular shape. 55
9. A lid according to Claim 7 or Claim 8, characterised in that the said proximal portion (90) is of generally trapezoidal shape.
10. A lid according to any preceding Claim, characterised in that it is constituted by a single body of foldable sheet material.
11. A carton of sheet material which includes:
- a base (1) which includes corner formations (42) having, for each pair of adjacent corner formations, an associated first pair (4) and an associated second pair (5) of opposite sides, with the sides of the said second pair (5) having lateral arms (51) which can be folded against, and fixed to a respective pair of the said corner formations (42), and
 - a lid according to any one of Claims 1 to 10.
12. A carton according to Claim 11, characterised in that, in the packaged condition, the said base (1) and the said lid (6) have associated therewith:
- first connection points (P) interposed between the sides of the said first pair (4) and the respective sides of the said first pair (8), and
 - second connection points (S) interposed between the corner formations (42) and the said end arms (51) of the said second pair (5), substantially without any connection points between the respective sides of the said second pair (9).
13. A carton according to Claim 12, characterised in that the said connection points are constituted by beads of hot-melt glue.









European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 99 83 0548

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B65D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		3 February 2000	Berrington, N
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 99 83 0548

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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