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(11) **EP 1 281 629 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
05.02.2003 Bulletin 2003/06

(51) Int Cl.7: **B65D 57/00**, B65D 71/00,
B65B 11/02, B65B 61/20

(21) Application number: **02017137.7**

(22) Date of filing: **30.07.2002**

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

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(30) Priority: **30.07.2001 GB 0118512**

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(54) **Pallet cover and blank therefor**

(57) A method of forming a palletised load, comprising placing one or more layers of articles on a pallet, placing a cover sheet (20) on at least one of the layers, each sheet having at least one hinged marginal flap (14,16), and stretch wrapping the layers and the sheet with a web of wrapping film (C), thereby folding the at

least one marginal flap (14,16) into a substantially perpendicular position simultaneously with the stretch wrapping. In addition, there is a divider structure (20) for placement on or in a palletised load, including a top panel and at least one marginal flap (14,16) hingedly connected to the top panel.

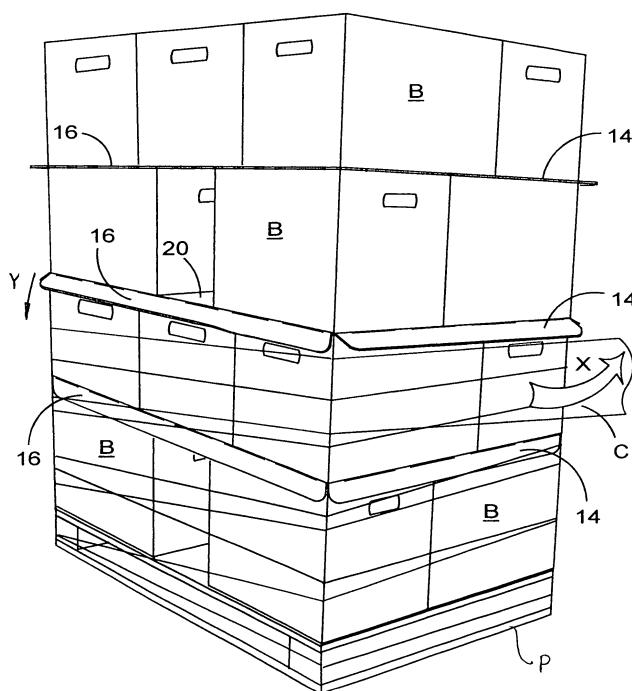


FIGURE 2

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Description

[0001] The present invention relates to a pallet cover for mounting on pallets, which pallet cover may protect both the load borne by the pallet and the surface of the pallet itself. Particularly, it relates to such a pallet cover, and the blank for forming the same.

[0002] Wooden pallets are a cheap and convenient method of handling and transporting products and materials, used widely on a daily basis. There are a number of problems with such pallets. Due to the naturally imperfect nature of the wood surface, with cracks and blemishes, dirt and microorganisms may accumulate. Clearly, if the pallet's load is a fresh product, such as a foodstuff, this accumulation of dirt is a serious problem. Some sort of barrier is needed.

[0003] Also, if the load is a fluid-containing product, leakage may stain the pallet, or cause it to become sticky. Again, this may be limited by the use of a cover or barrier apparatus.

[0004] US Patent No 6 101 955, to Salce, discloses a pallet cover made of impervious materials such as metal, plastics or synthetics. The pallet cover disclosed is formed into an inverted tray shape during manufacture by a moulding process. The pallet cover disclosed in this patent is always in this inverted tray shape may pose difficulties in storing a plurality of such pallet covers.

[0005] A further problem with placing a plurality of items on a pallet is that, for the reasons mentioned above, the items are generally unstable, the higher they are stacked. One approach commonly used is to use a pre-glued pallet cover, which is an inverted tray shape. This is expensive, because the trays are made beforehand, and require a large storage area.

[0006] The present invention and its preferred embodiments seek to overcome, or at least to mitigate, the problems of the prior art.

[0007] One aspect of the invention provides a method of forming a palletised load, comprising placing one or more layers of articles on a pallet, placing a cover sheet on at least one of the layers, each sheet having at least one hinged marginal flap, and stretch wrapping the layers and the sheet with a web of wrapping film, thereby folding the at least one marginal flap into a substantially perpendicular position simultaneously with the stretch wrapping. Preferably, the marginal flap may have rounded corners to prevent the wrapping film from being caught by the corners during the flap-folding step and thereby to facilitate the flap-folding step.

[0008] A second aspect of the invention provides a divider structure for placement on or in a palletised load, including a top panel and at least one marginal flap hingedly connected to the top panel. Preferably, the at least one marginal flap may include opposed side flaps and opposed end flaps.

[0009] According to an optional feature of the second aspect of the invention the divider structure may be formed of paperboard or corrugated board.

[0010] According to another optional feature of the second aspect of the invention the one marginal flap may have rounded corners so that a wrapping film is not caught on the flap corners when the palletised load is stretch wrapped by the wrapping film.

[0011] A third aspect of the invention provides a pallet cover comprising a cover panel hingedly connected to end panels at opposite edges of that cover panel, and hingedly connected to side flaps at each of the remaining edges of the cover panel. Preferably, the cover panel may correspond substantially in length and width to the pallet, such that when the pallet cover is mounted on a pallet, the end and side flaps may be folded into a position parallel and spaced from the outer faces of the pallet.

[0012] According to an optional feature of the third aspect of the invention the cover panel may be connected to the end panels and side flaps by a series of interrupted fold lines to aid folding.

[0013] A fourth aspect of the invention provides a blank for the formation of a divider structure for placement on or in a palletised load, including a top panel and at least one marginal flap hingedly connected to the top panel. Preferably, the at least one marginal flap may include opposed side flaps and opposed end flaps.

[0014] According to an optional feature of the fourth aspect of the invention the blank may be formed of paperboard or corrugated board.

[0015] According to another optional feature of the fourth aspect of the invention the one marginal flap may have rounded corners so that a wrapping film is not caught on the flap corners when the palletised load is stretch wrapped by the wrapping film.

[0016] A fifth aspect of the invention provides a method of forming a palletised load comprising placing one or more layers of articles on a pallet, placing a cover sheet on at least one of the layers by using a robot and stretch wrapping the layers and thereby forming the palletised load.

[0017] Exemplary embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

FIGURE 1 illustrates a blank for forming a pallet cover according to one embodiment of the present invention; and

FIGURE 2 illustrates pallets loaded with a plurality of articles and shows how the edge panels of the pallet covers are brought into a parallel relationship with the vertical faces of the load, by the process of wrapping the stack of loaded pallets.

[0018] Referring to these drawings, there is shown in Figure 1 a blank 10 for forming a pallet cover, made from paperboard or other suitable foldable sheet material, for example plastics material. In this embodiment it is a unitary blank, although more than one blank may be used

without departing from the scope of invention.

[0019] The blank 10 comprises a divider or cover panel 20. There further comprises a marginal flap hingedly connected to the cover panel 20 and, more preferably, a plurality of marginal flaps. In the illustrated embodiment, the marginal flaps are provided by end flaps 12, 14 hingedly connected at opposite ends of the cover panel 20 by the respective fold lines 22 and 24. In figure 1 there further comprises opposed side flaps 16, 18 hingedly connected to cover panel 20 by fold lines 26 and 28 respectively.

[0020] In one class of embodiments, the cover panel 20 corresponds substantially in size to the pallet for which it is to be used, so that the fold lines 22, 24, 26, 28 are co-planar with and spaced from the edges of the pallet; the end panels 12 and 14, and side flaps 16 and 18 will protrude from the edges of a stack of loaded pallets.

[0021] Preferably, apertures A1, A2, A3 and A4 are provided in cover panel 20 to aid the guiding of the blank through the production process in manufacture.

[0022] Preferably, the fold lines 22, 24, 26 and 28 are interrupted by a series of perforations 30 along their lengths. These perforations further aid folding of the side flaps 16 and 18 and the end panels 12 and 14 into a substantially perpendicular relationship with the load panel 20 as described above.

[0023] Figure 2 illustrates the construction and arrangement of a cover panel 20 in a loaded pallet. It will be seen that one or more blanks 10 are placed intermediate adjacent layers of articles B in a stacked pallet P. The stack is then wrapped by application of a web of wrapping film C in the direction X. As the film is wrapped around the stack, it comes into contact with one of the marginal flaps, which causes it to fold in a downward direction Y.

[0024] As this wrapping process continues, each marginal flap 12, 14, 16, 18 is folded successively and brought progressively into a substantially parallel relationship with the outer walls of the articles B. The articles continue to be stretch wrapped by the web of wrapping film to cover the sides of the pallet, and to secure the cover panel 20 in place intermediate each layer, thereby to provide a more rigid structure.

[0025] Preferably the marginal flaps 12, 14, 16, 18 have rounded corners to prevent wrapping film from being caught by the corners during the film wrapping process and to encourage the downward movement.

[0026] In order to control the flap folding process the film is applied at a shallow angle, for example 5 to 20 degrees and by hand or automated machinery. At a shallow angle the film will need to be placed over the marginal flaps in two or three layers. An alternative or additional method of controlling the fold direction is to pre-fold the marginal flaps along fold lines 22, 24, 26, 28, either when the blank is formed or once the marginal flaps are in position in the stack. For example, one or more guides could be used in conjunction with the ma-

chinery applying the film to cause the flaps to be folded downwardly.

[0027] The folding of the marginal flaps in this embodiment is in a downward direction, although it is envisaged that in some embodiments it will be desirable for the base of the layer to be supported by the pallet cover. In these embodiments, the marginal flaps are folded in an upward direction. To control the flap folding process in an upward direction the film is applied at a steeper angle, for example 25 degrees to 45 degrees and/or the flaps are pre-folded in an upward direction.

[0028] It is envisaged that the cover panel 10 can be used intermediate adjacent layers as a divider wall or as panel to be placed under the base or on top of the lowermost and upper layers respectively, to provide additional protection to the layers.

[0029] Further, the blank can be applied below, above or intermediate the or each layer of articles by using a robot of a known type, which robot is controlled by a controller. The controller also controls the stretch wrapping process and, in particular, the rate of feed of stretch film, the angle of feed and the rotational speed of the stretch film about the pallet and/or pallet speed.

[0030] Suitable securing means, for example glue, may be applied to one or both sides of the marginal flap (s) to secure it to the article and/ or the film.

[0031] It is an object of the invention is to provide one or more marginal flaps which, during the process of wrapping a stack of loaded pallets, are automatically brought into a substantially perpendicular relationship with the upper surface of the article layers on which the pallet cover is mounted, such that those marginal flaps abut or are juxtaposed part of the sides of the article layer to hold the pallet cover in place on the pallet and to restrict movement of adjacent article layers.

[0032] It will be recognised that as used herein, directional references such as "side", "end", "marginal" and "cover" do not limit their respective components to such orientation but merely serve to distinguish these components from one another. Any reference to a hinged connection or a fold line should not be construed as necessarily referring to a single fold line only. Indeed, it is envisaged that hinged connection may be achieved by any of the following: a score line, a frangible line or a fold line, without departing from the scope of the invention.

[0033] It will be understood that numerous changes may be made within the scope of the invention. For example, the size and shape of a panel may be altered according to the specific requirements of the loads to be borne, as may the positioning and/or nature of fold lines for the particular pallets.

Claims

1. A method of forming a palletised load, comprising placing one or more layers of articles on a pallet,

placing a cover sheet under at least one of the layers, each sheet having at least one hinged marginal flap, and stretch wrapping the layers and the sheet with a web of wrapping film, thereby folding the at least one marginal flap into a substantially perpendicular position simultaneously with the stretch wrapping.

2. The method of claim 1 wherein the marginal flap has rounded corners to prevent the wrapping film from being caught by the corners during the flap-folding step and thereby to facilitate the flap-folding step. 10
3. A divider structure for placement on or within a palletised load, including a top panel and at least one marginal flap hingedly connected to the top panel. 15
4. A divider structure as claimed in claim 3 wherein the at least one marginal flap includes opposed side flaps and opposed end flaps. 20
5. A divider structure as claimed in claim 3 or claim 4 which is formed of paperboard or corrugated board.
6. A divider structure as claimed in any of claims 3 to 6 wherein the one marginal flap has rounded corners so that a wrapping film is not caught on the flap corners when the palletised load is stretch wrapped by the wrapping film. 25
30
7. A pallet cover comprising a cover panel hingedly connected to end panels at opposite edges of that cover panel, and hingedly connected to side flaps at each of the remaining edges of the cover panel. 35
8. A pallet cover as claimed in claim 7, wherein the cover panel corresponds substantially in length and width to the pallet, such that when the pallet cover is mounted on a pallet, the end and side flaps may be folded into a position parallel and spaced from the outer faces of the pallet. 40
9. A pallet cover as claimed in claim 7 or claim 8, wherein the cover panel is connected to the end panels and side flaps by a series of interrupted fold lines to aid folding. 45
10. A blank for the formation of a divider structure for placement on or in a palletised load, including a top panel and at least one marginal flap hingedly connected to the top panel. 50
11. A blank as claimed in claim 10 wherein the at least one marginal flap includes opposed side flaps and opposed end flaps. 55
12. A blank as claimed in claim 10 or claim 11 which is formed of paperboard or corrugated board.

13. A blank as claimed in any of claims 10 to 12 wherein the one marginal flap has rounded corners.

14. A method of forming a palletised load comprising placing one or more layers of articles on a pallet, placing a cover sheet on at least one of the layers by using a robot and stretch wrapping the layers and thereby forming the palletised load.

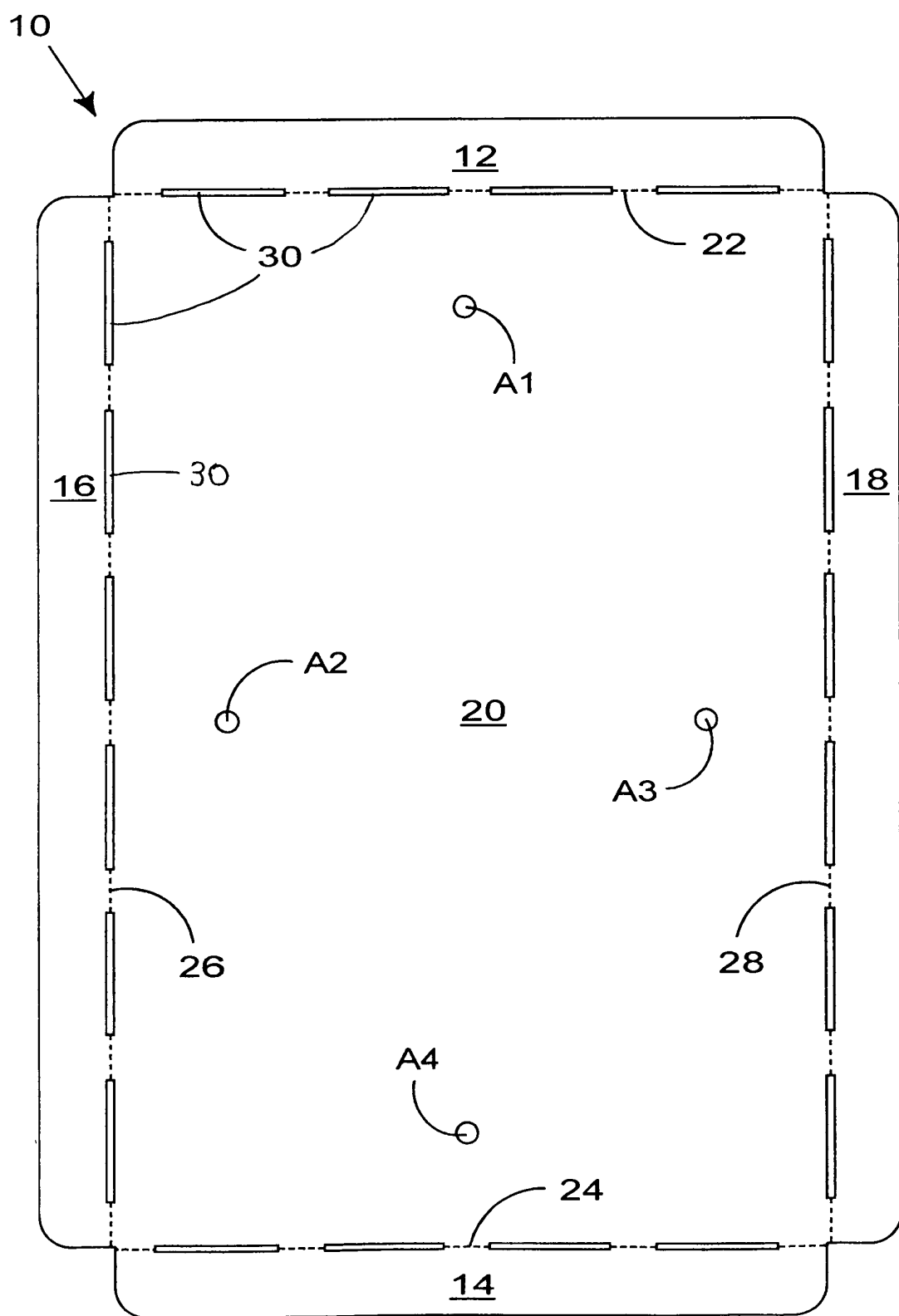


FIGURE 1

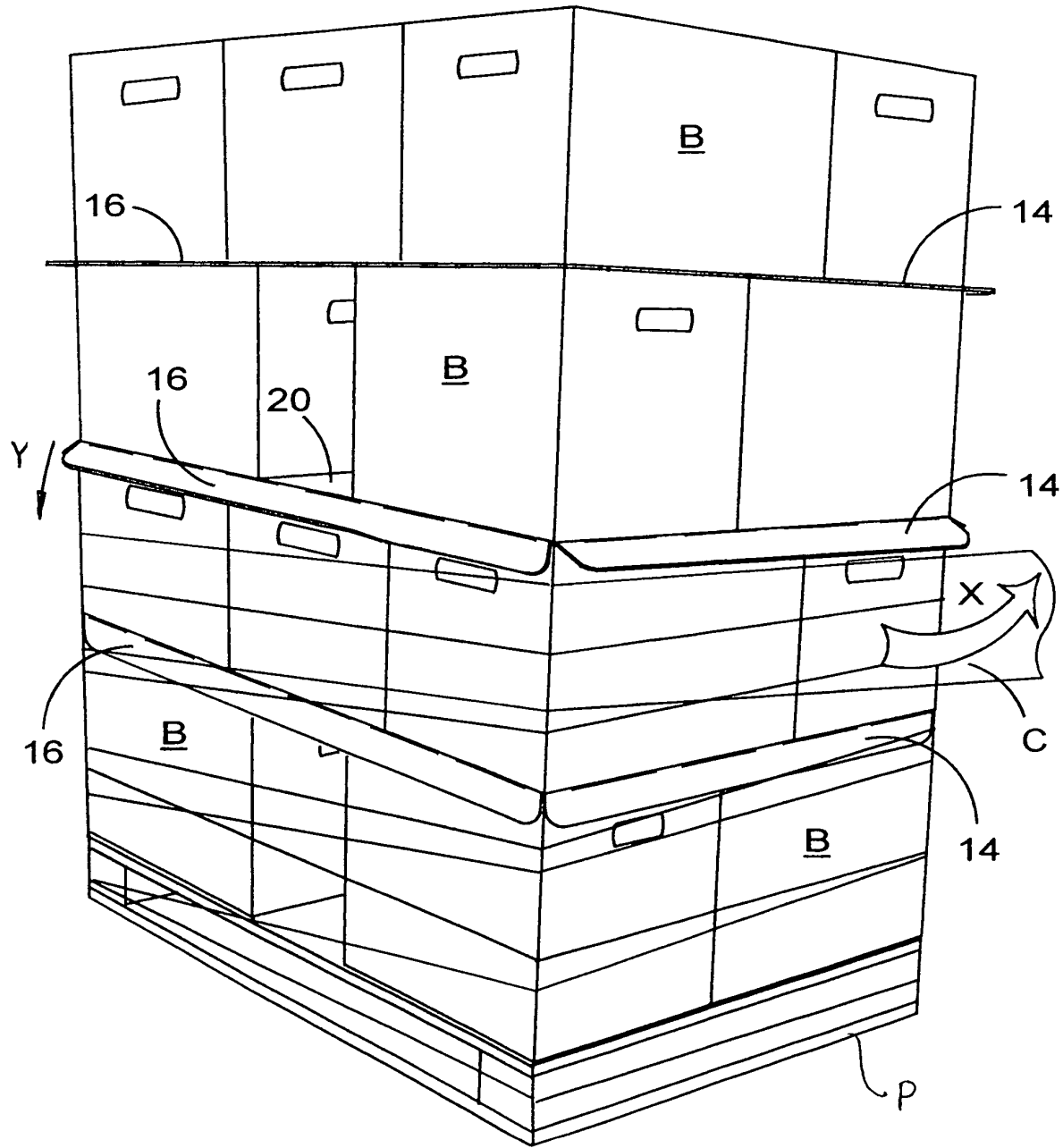


FIGURE 2



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EUROPEAN SEARCH REPORT

Application Number
EP 02 01 7137

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.7)
X	US 5 336 042 A (WINSKI ERNEST P ET AL) 9 August 1994 (1994-08-09) * column 8, line 57 - column 11, line 17 *	1,3-5, 7-12,14	B65D57/00 B65D71/00 B65B11/02 B65B61/20
Y	---	2	
X	FR 2 748 458 A (KAYSERSBERG PACKAGING SA) 14 November 1997 (1997-11-14) * page 1, line 5-28 * * page 2, line 8-10 * * page 3, line 6 - page 4, line 17 *	3,4,6-8, 10-13	
X	US 6 047 523 A (GAVIN JAMES R ET AL) 11 April 2000 (2000-04-11) * column 4, line 28 - column 5, line 16 * * figures 1,2 *	7,8, 10-13	
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B65D B65B
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 30 October 2002	Examiner Kakoullis, M
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			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 02 01 7137

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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