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(54) Web of interconnected plastic bags and bag manufactured from this web

(57) In a web (4) of bags (8) which are interconnected via a first wall weakening (6) and are made of plastic film material, each bag in the web comprises a tubular film part which is provided, on two longitudinal sides situated opposite one another, with concertina folds (10). Each bag is provided, in the region of one end (21), with a first transverse bottom seem (22). The bag is provided, in the region of both ends (20, 21), with oblique concertina-fold part seams. Each bag is provided, in the region of the oblique concertina-fold part seams (24, 24' and 26, 26', respectively), with a second wall weakening (30), which extends, in the transverse direction of the bag, from the outer longitudinal concertina-fold edges (14) on one of the two longitudinal sides of the bag over at least part of the width of the bag. The tear-open strip is formed as a result.

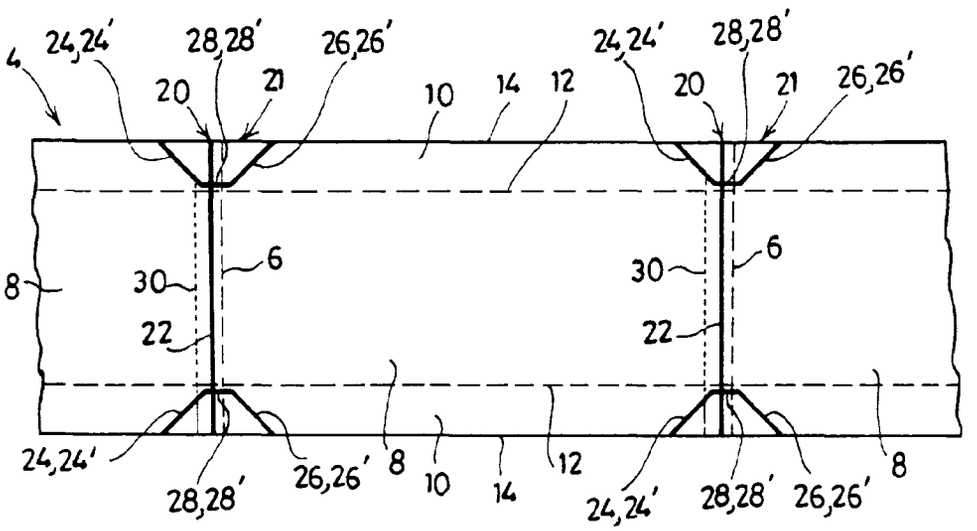

Fig: 2.

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Description

The invention relates to a web of interconnected bags made of plastic film material, each bag in the web comprising a tubular film part which is provided, on two longitudinal sides situated opposite one another, with concertina folds, which each comprise one inner and two outer longitudinal concertina-fold edges, which delimit a first and a second concertina-fold part, each bag being provided, in the region of one end, with a first transverse bottom seam, which extends in the transverse direction and over the entire width of the bag, and, on both longitudinal sides, with two first concertina-fold part seams, which extend obliquely from the outer longitudinal concertina-fold edges towards the inner longitudinal concertina-fold edge and towards the end in question, as far as the first transverse bottom seam, and being provided, in the region of the other end, on both longitudinal sides, with two second concertina-fold part seams, which extend obliquely from the outer longitudinal concertina-fold edges towards the inner longitudinal concertina-fold edge and towards the end in question, and the web being provided, at the location of the connection between two mutually adjacent bags, with a first wall weakening, which extends in the transverse direction of the web.

A web of bags of this kind is known, inter alia, from NL-A-7,903,733 in the name of the applicant. For filling purposes, the individual bags are torn off from the web, filled and, after the filling operation, closed on the filling side by means of a second transverse bottom seam, which is similar to the first transverse bottom seam at the opposite end. The filled bags can easily be made into a block and stacked.

In some cases, it is considered inconvenient that the final user can only open the bags by means of a knife, scissors or some other sharp object.

The object of the invention is to provide a solution to this problem.

This object is achieved according to the invention in that, in the web mentioned at the beginning, each bag, viewed in the longitudinal direction, is provided, in the region of the first or second oblique concertina-fold part seams, with a second wall weakening, which extends, in the transverse direction of the bag, from the outer longitudinal concertina-fold edges on one of the two longitudinal sides of the bag over at least part of the width of the bag.

By means of this measure, a final user can easily tear open a filled bag at the location of the second weakened wall section, it being possible to use that portion of the concertina fold which is situated between this weakened wall section and the end of the bag as a kind of handle.

Preferred embodiments of the bag according to the invention are defined in the dependent claims.

The invention also relates to a bag manufactured from the web according to the invention.

The invention will be explained in more detail in the following exemplary embodiment with reference to the drawing, in which:

Fig. 1 shows a perspective view of a web of bags according to the invention which has been partly unrolled from a roll;
Fig. 2 shows a top view of a bag, which has been folded flat, from the web of bags of Fig. 1, together with the end portions of the bags connected thereto;
Figs. 3a-g show various other possible embodiments of the second wall weakening;
Fig. 4 shows a perspective view of a filled bag according to the invention which has been made into a block;
Fig. 5 shows a corner portion of the bag of Fig. 4, on an enlarged scale.

Fig. 1 shows a web 4 of bags according to the invention which has been partly unrolled from a roll 2. The web 4 of bags, which is manufactured from a tubular film, comprises bags 8 which are interconnected via a connection with a first wall weakening 6. Each bag 8 in the web 4 comprises a tubular film part which is provided, on two longitudinal sides situated opposite one another, with concertina folds 10, which each comprise one inner 12 and two outer longitudinal concertina-fold edges 14, which delimit a first 16 and a second concertina-fold part 18.

As can be seen in Fig. 2, each folded-flat bag 8 is provided, in the region of one end 20, with a first transverse bottom seam 22, which extends in the transverse direction and over the entire width of the bag, and, on the two longitudinal sides, with two first concertina-fold part seams 24, 24', which extend obliquely from the outer longitudinal concertina-fold edges 14 towards the inner longitudinal concertina-fold edge 12 and towards the end in question, as far as the first transverse bottom seam 22, the seam 24 connecting the film layers of the concertina-fold part 16 to one another and the seam 24' connecting the film layers of the concertina-fold part 18 to one another. In the region of the other end 21, each bag 8 is provided, on both longitudinal sides, with two second concertina-fold part seams 26, 26', which extend obliquely from the outer longitudinal concertina-fold edges 14 towards the inner longitudinal concertina-fold edge 12 and towards the end in question, the seam 26 connecting the film layers of the concertina-fold part 16 to one another and the seam 26' connecting the film layers of the concertina-fold part 18 to one another. In the embodiment shown, the first concertina-fold part seams 24, 24' are connected, via connection seams 28, 28' running parallel to the inner concertina-fold longitudinal edge 12, to the second concertina-fold part seams 26, 26' of an adjacent bag, the seem 28 connecting the film layers of the concertina-fold part 16 to one another and the seam 28' connecting the film layers of the concertina-fold part 18 to one another. However, it is also

possible to omit the connecting seams 28, 28'.

In the embodiment of Fig. 2, each bag 8, viewed in the longitudinal direction, is provided, in the region of the first concertina-fold part seams 24, 24' with a second wall weakening 30, which extends in the transverse direction of the bag, from the outer longitudinal concertina-fold edges 14 on the lower longitudinal side of the bag in the drawing, as far as the oblique concertina-fold part seams 24, 24' on the other longitudinal side, and in both film layers, which rest on top of one another, of the folded-flat bag. In the region of the lower concertina fold 10 in the drawing, between the outer longitudinal concertina-fold edges 14 and the oblique concertina-fold part seams 24, 24', the web is cut through completely at the location of the second weakened wall weakening 30.

However, the second wall weakening 30 may have other, different embodiments, as shown in Figs. 3a-g. In Figs. 3a, b, the wall weakening 30a or 30b, respectively, extends, from the outer longitudinal concertina-fold edges 14 on one of the two longitudinal sides of the folded-flat bag, over part of the width of the bag. In Figs. 3c-g, the wall weakening 30c, 30d, 30e, 30f or 30g, respectively, extends over the entire width of the folded-flat bag. The embodiments of Figs. 3c-g are not preferred, however, since when the bag is torn along the second wall weakening 30 a tear strip which is entirely separate from the rest of the bag is formed.

In all these embodiments of the second wall weakening 30, the film is weakened, in the region between the oblique concertina-fold part seams 24, 24' on either side of the bag, to such an extent that the tensile strength of the film at that location is between about 50% and about 70%, and preferably about 60%, of the unweakened film. This means that the filled and closed bag on the one hand has sufficient strength and does not tear open if dropped from a height of two metres and on the other hand can easily be torn open along the second wall weakening for opening purposes. A weakening of this kind is shown by a dotted line.

In the region of the concertina folds 10, between the outer longitudinal concertina-fold edges 14 and the oblique concertina-fold part seams 24, 24', the film may be weakened (indicated by a dotted line) or cut through completely(indicated by a dashed line) on either side of the bag, in the same manner as between the concertina-fold part seams. The film may also be cut through completely (indicated by a solid line) in the region in question.

In another embodiment (not shown) of the bag, the second wall weakening 30 may be arranged in the region of the second concertina-fold part seams 26, 26'.

The nature of the second wall weakening 30 depends on the material to be packaged in the bag. If material which needs to breath is to be packaged in the bag, the second wall weakening 30 will preferably comprise, at least in the region between the oblique concertina-fold part seams 24, 24' and 26, 26', respectively, on either side of the bag, a series of minuscule holes in the film. If, however, the material to be packaged in the bag has to remain completely dry, the second wall weakening 30 in the region in question will comprise a partial, seen in the thickness direction of the film, cut through the film.

In the region of the concertina folds 10, between the outer longitudinal concertina-fold edges 4 and the oblique concertina-fold part seams 24, 24' and 26, 26', respectively, the nature of the wall weakening will be determined by the ease with which it is intended to be able to open the filled bag.

As already stated, the second wall weakening should be such that the requirement that a filled bag does not tear open in the event of being dropped from a height of two metres is fulfilled. Also, the bag should not tear at the location of the second wall weakening during handling of the bag before, during and after filling.

Fig. 4 shows a filled bag 8, which has been closed on the filling side by a second bottom seam 31, made into a block and has a second wall weakening 30 of the type shown in Fig. 2. Fig. 5 shows a corner portion of this bag, on an enlarged scale. It can be clearly seen that the second wall weakening 30 extends in both film layers, which are situated on top of one another in the folded-flat bag. A bag of this kind can easily be opened without using any special equipment, such as a knife, scissors or other sharp object, by gripping and pulling away that portion 32 of the concertina fold 10 which, owing to the complete cuts 34, is in the form of a free lip, as a result of which action the film is torn along the second wall weakening 30. In the embodiment in which the second wall weakening 30 does not extend over the entire width of the bag, the strip torn loose in this manner remains connected to the rest of the bag and can be used as a tie strip, so that the bag does not have to be emptied in one go. Moreover, this has the advantage that the strip torn loose is not thrown away as separate waste, but can be removed at the same time as the material of the emptied bag, in order to be recycled, which is more beneficial to the environment.

Claims

1. Web of interconnected bags made of plastic film material, each bag in the web comprising a tubular film part which is provided, on two longitudinal sides situated opposite one another, with concertina folds, which each comprise one inner and two outer longitudinal concertina-fold edges, which delimit a first and a second concertina-fold part, each bag being provided, in the region of one end, with a first transverse bottom seam, which extends in the transverse direction and over the entire width of the bag, and, on both longitudinal sides, with two first concertina-fold part seams, which extend obliquely from the outer longitudinal concertina-fold edges to-

wards the inner longitudinal concertina-fold edge and towards the end in question, as far as the first bottom transverse seam, and being provided, in the region of the other end, on both longitudinal sides, with two second concertina-fold part seams, which extend obliquely from the outer longitudinal concertina-fold edges towards the inner longitudinal concertina-fold edge and towards the end in question, and the web being provided, at the location of the connection between two mutually adjacent bags, with a first wall weakening, which extends in the transverse direction of the web, characterized in that each bag (8), viewed in the longitudinal direction, is provided, in the region of the first or the second oblique concertina-fold part seams (24, 24' and 26, 26', respectively), with a second wall weakening (30), which extends, in the transverse direction of the bag, from the outer longitudinal concertina-fold edges (14) on one of the two longitudinal sides of the bag over at least part of the width of the bag.

2. Web according to claim 1, characterized in that the second wall weakening (30) extends from the outer longitudinal concertina-fold edges (14) on one of the two longitudinal sides of the bag (8) as far as the oblique concertina-fold part seams (24, 24' and 26, 26', respectively) on the other longitudinal side.

3. Web according to claim 1 or 2, characterized in that the second wall weakening (30) is such that, in the region of at least one of the concertina folds (10), between the outer longitudinal concertina-fold edges (14) and the oblique concertina-fold part seams (24, 24' and 26, 26', respectively), the film is cut through partially or completely, and in the region between the oblique concertina-fold part seams (24, 24' and 26, 26', respectively) on either side of the bag the film still has a sufficient tensile strength at the location of the second wall weakening.

4. Web according to one of claims 1 - 3, characterized in that the film, in the region of at least one of the concertina folds (10), between the outer longitudinal concertina-fold edges (14) and the oblique concertina-fold part seams (24, 24' and 26, 26', respectively), is cut through completely in line with the second wall weakening (30) between the oblique concertina-fold part seams (24, 24' and 26, 26', respectively) on either side of the bag (8), and in the corresponding region of the other concertina fold (10) is unweakened and is not cut through.

5. Web according to one of claims 1 - 4, characterized in that the second wall weakening (30) extends over the entire width of the bag (8).

6. Bag manufactured from a web according to one of claims 1 - 5.

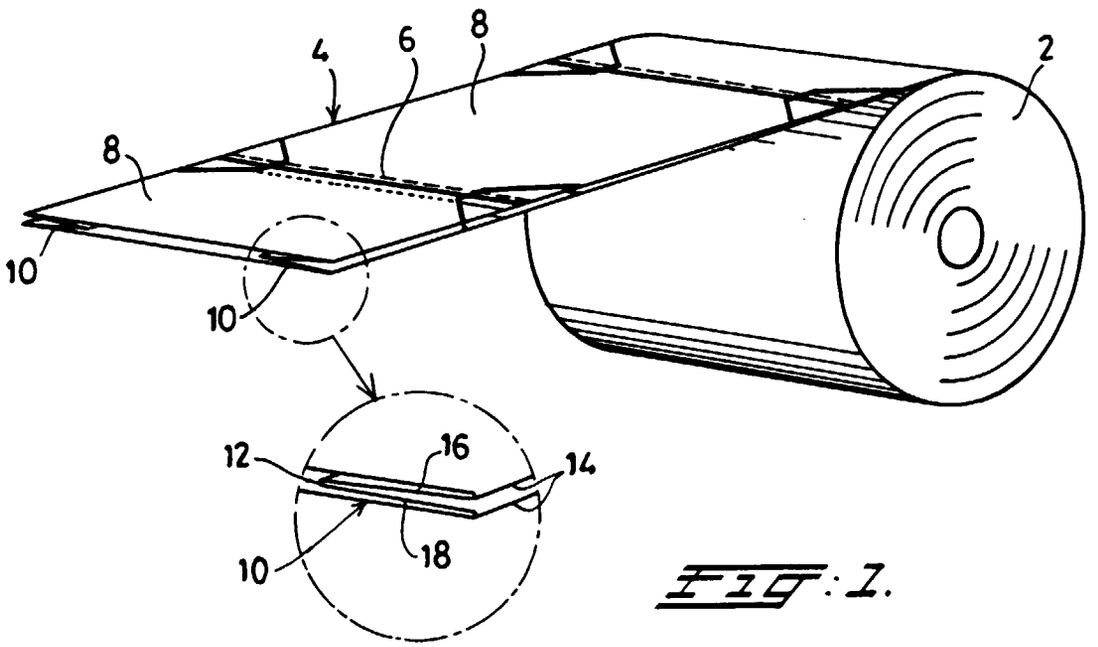
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Fig. 1.

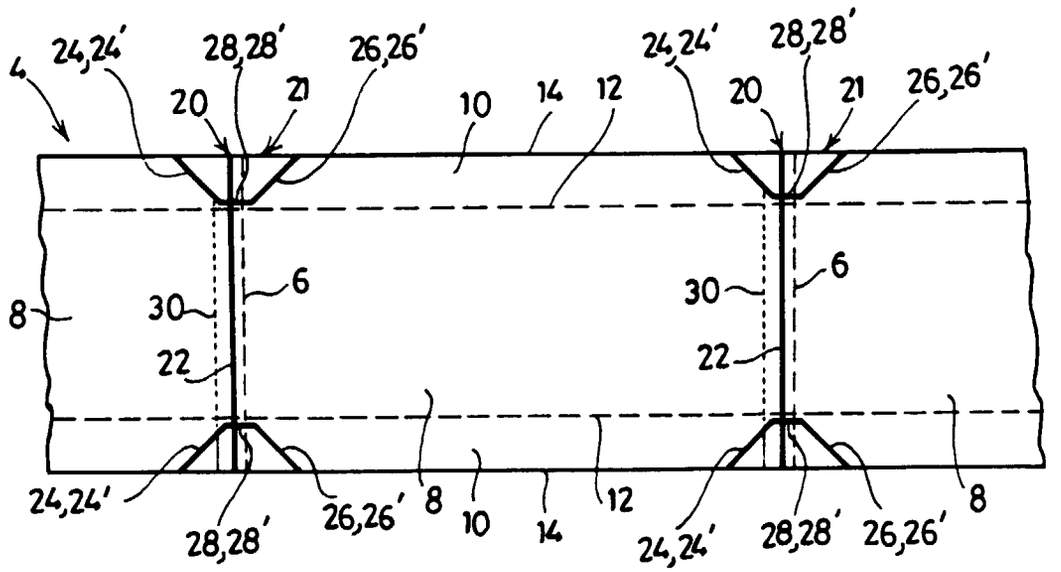
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Fig. 2.

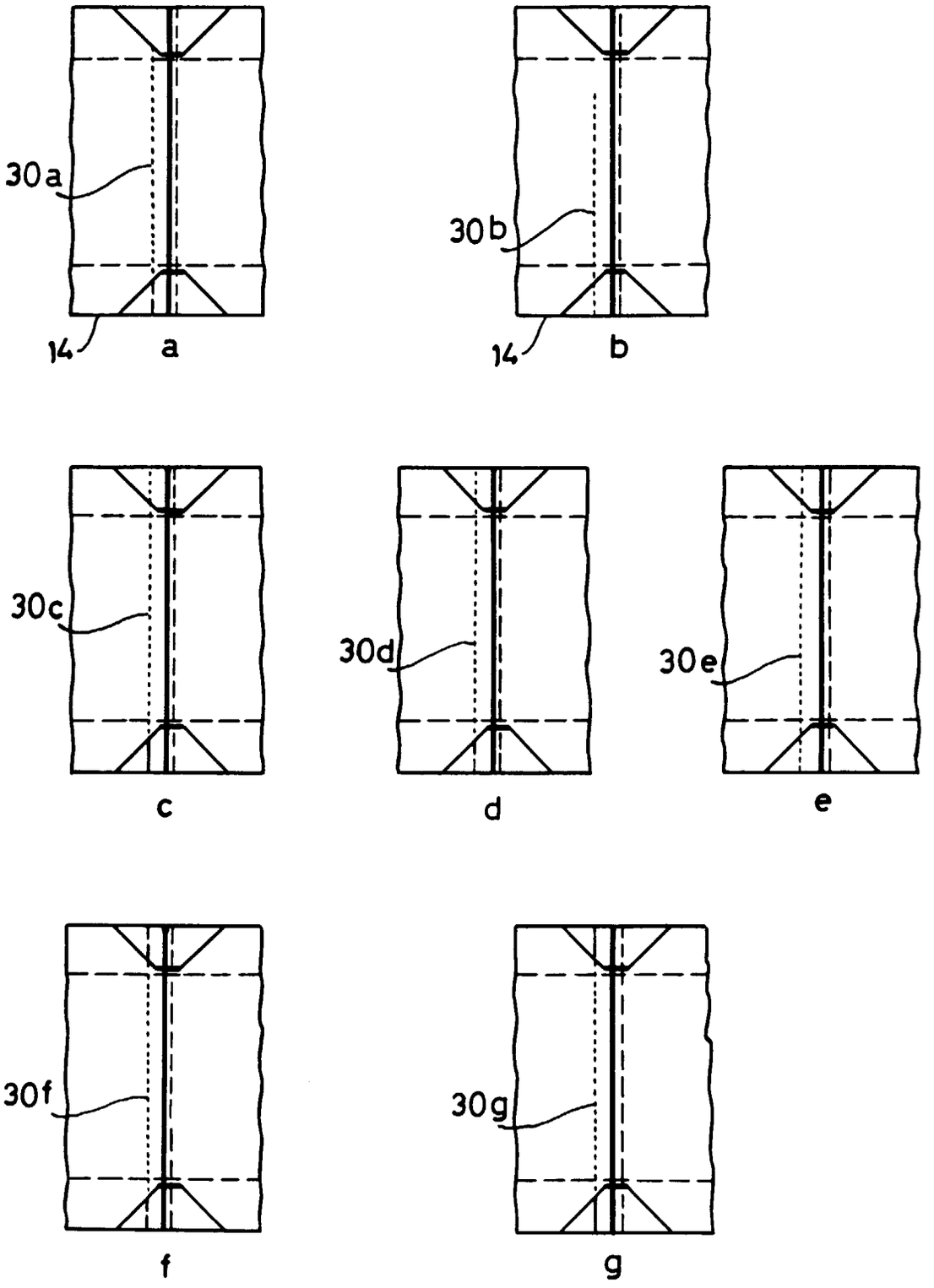

Fig. 3.

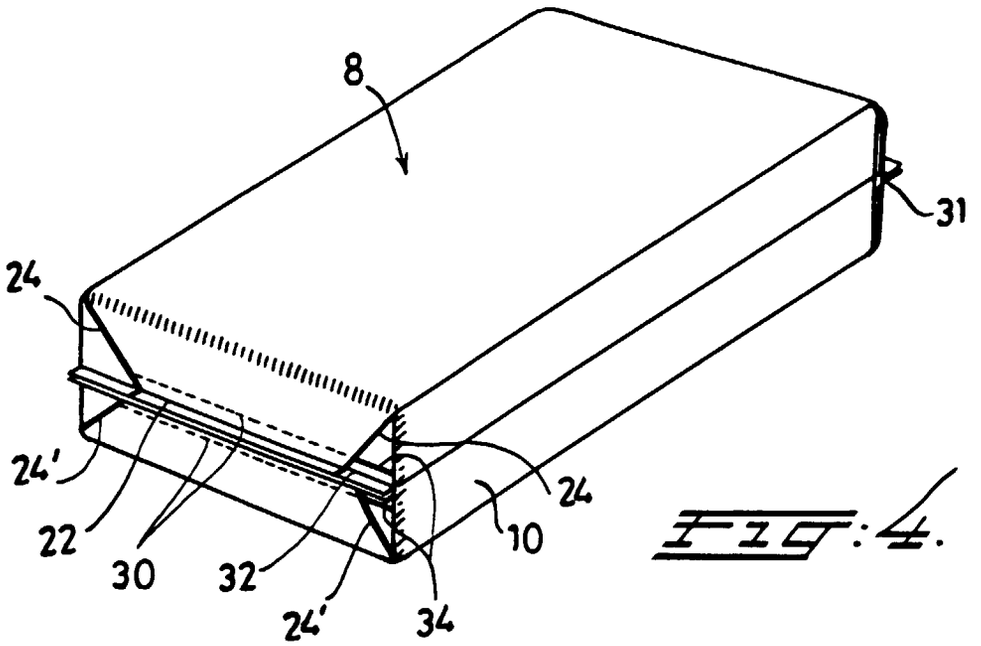

Fig: 4.

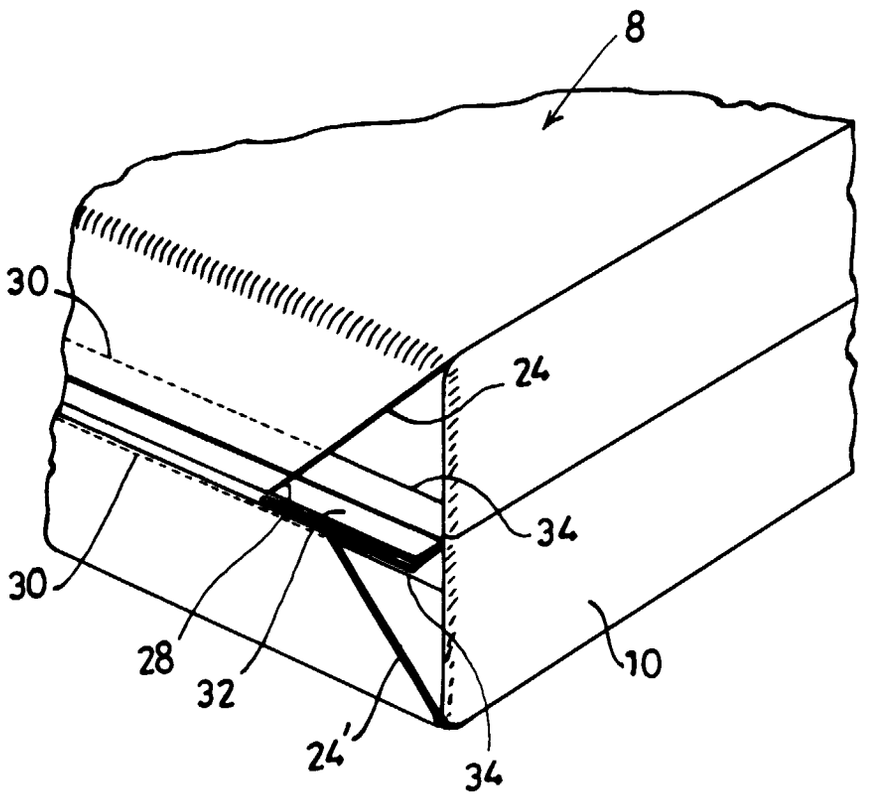

Fig: 5.

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EUROPEAN SEARCH REPORT

Application Number
EP 97 20 1373

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)
D,A	NL 7 903 733 A (WAVIN) 13 November 1980 * claim 1; figures 1-6 *	1,6	B65D33/00
A	EP 0 357 481 A (MAISONNIAL) 7 March 1990 * column 4, line 1 *	1-6	
A	LU 68 142 A (KOLCK) 16 October 1973 * page 5, line 24 - page 7, line 10; figures 1-4 *	1-6	
A	US 3 254 828 A (LERNER) 7 June 1966 * claims 1-4; figures 1-17 *	1-6	
A	DE 90 17 942 U (SENGEWALD) 14 November 1991 * claims 1-4; figures 1-6 *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

B65D
B31B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	18 July 1997	Vantomme, M

CATEGORY OF CITED DOCUMENTS

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