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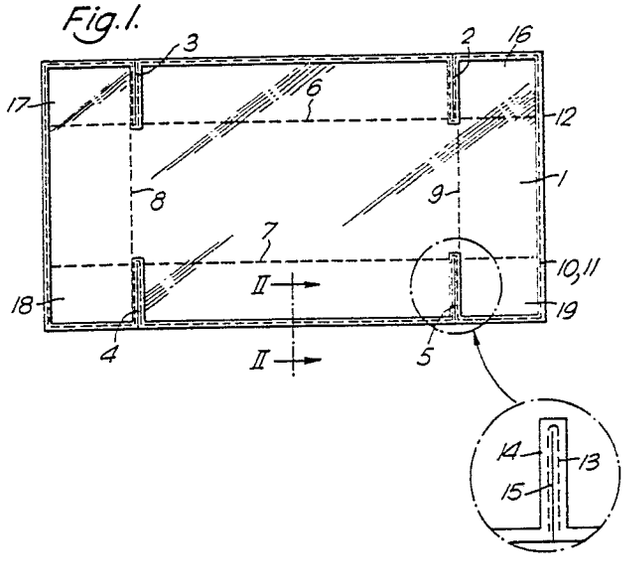
(54) A waterproof box or cover blank.

(57) A waterproof box or cover blank comprises a flat sheet (1) of non-waterproof corrugated paperboard, which has folding lines (6,7,8,9) and, if desired, incisions (2,3,4,5) for forming corner flaps (16, 17, 18, 19). Blank (1) is on both sides covered by a waterproof plastic film (10, 11), which films are joined by welding outside the external edges of blank (1). Plastic films (10,11) are loosely arranged, i.e. not attached to the flat sheet (1). Plastic films (10,11) are also bonded in slots (2, 3, 4, 5) and split centrally inside them, slots (2, 3, 4, 5) having a width to provide space for welding and slotting tools.

Fig.1.



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A WATERPROOF BOX OR COVER BLANK

The present invention relates to a waterproof box or cover blank comprising a flat sheet of a material that is not waterproof, e.g. corrugated cardboard, with folding lines and, if desired, with incisions for forming flaps.

Such blanks are used to form a number of different kinds of boxes and crates. The blanks are transported in the flat from the packing factory to the user and are mounted, often mechanically, at the user's place. Such boxes or crates which are produced from a non-waterproof material, cannot be used for moist goods or goods setting free moisture, and neither can they be used in a moist environment. Such blanks being inexpensive, many efforts have been made to make them waterproof, so that they may be used under conditions as mentioned above. There is, e.g. a great demand for packing material for fish to be transported in an iced state over long distances. Previously, such boxes were manufactured from expanded plastic, e.g. polystyrene. Such boxes are relatively expensive in manufacture, as well as being bulky in transport, since they cannot be manufactured in a flat state. Nowadays, there is also considerable resistance in many countries against use of such packing material, because when destructed it gives off substances that may destroy the ozone layer of the atmosphere. Experiments to make non-waterproof material waterproof involved lamination with a watertight film on both sides. However, no sealing of the edges is achieved, and the packing may thus be destroyed by water penetrating into it through the edges. Also, efforts were made to line such packing material by the aid of a bag-shaped lining which is attached to the folding sheet. This would, however, be an expensive measure, as well as being undesirable to the user, as such a lining must be inserted after the box has been mounted.

As regards transport of fish, which is an important application in connection with the present invention, boxes or crates of the mentioned kind, in which the flaps are formed by the aid of slots or incisions, can only be used in cases when it is acceptable that water seeps from the crates. Such a packing cannot be waterproof as water may flow through said slots. For the time being, such packings are permitted for transport on trucks, in spite of the fact that quite considerable volumes of water may leak from one single crate. In this connection, it should be mentioned that approximately 4-7 kgs of ice are used in a fish crate and in the worst case all ice may melt during transport. A truck driving with such a load would, thus, sprinkle thousands of litres of water on the road, which may make the road surface slippery. It is, thus, to be expected that such transport will be prohibited in the future. As regards air freight, packings must be completely tight. No leakage of liquid is permitted from goods transported by air. Packing crates used for fish for air freight comprise an external waterproof box with a perforated double bottom and an absorbing material provided between said double bottom and the external bottom of the box.

It is an object of the present invention to provide a waterproof crate or cover blank, based on a flat sheet of a non-waterproof material, e.g. corrugated paperboard with folding lines and, if desired, incisions forming flaps, out of which blank a box or a crate may be mounted.

According to the invention this is achieved by the fact that said blank is on both sides coated by a waterproof plastic film, which films are joined by welding outside the external edges of the blank, and by the fact that said plastic films are loosely arranged, i.e. not attached to the flat sheet of non-waterproof material.

By means of the invention several advantages are obtained. Primarily the production of the blank will be inexpensive.

Because the plastic films are loosely arranged outside of the blank, a good thermic insulation is obtained in that a layer of air is formed between the plastic film and the corrugated paper board blank. A second essential advantage obtained by the fact that the plastic film is loose in relation to the corrugated paper board, consist in easy removal of the plastic film for recirculation or destruction by means of fire.

A special embodiment in which the blank is provided with incisions or slots to form flaps, is characterized by the fact that the plastic films are also welded together in the incisions or slots and split centrally in the slot, said slots having such a width that there is space enough for welding and slotting tools.

Further features of the invention will appear from dependent claims 2-5.

The invention is disclosed in more detail below with reference to the drawings showing embodiments of the invention.

Figure 1 shows a plane blank according to the invention, which is intended for mounting a cover,

Figure 2 is a section along line II-II in Figure 1,

Figure 3 shows the blank in an mounted state in the form of a fish crate,

Figure 4 shows a section of a box or cover blank of another kind,

Figure 5 shows a corner of a box or cover

which is mounted from the blank of Figure 4, and

Figure 6 shows a flat blank intended for being mounted to form a box.

A plane sheet of a non-waterproof material 1, in this embodiment consisting of corrugated paperboard, is provided with slots 2, 3, 4, and 5 at two opposite longitudinal sides, and with longitudinal folding lines 6 and 7, and transverse folding lines 8 and 9. Sheet 1 is on both sides coated by a plastic film 10, and 11, respectively. The plastic films are slightly larger than sheet 1 to form a projecting rim 12 outside the edge of sheet 1. Edges 12 of films 10 and 11 are bonded so that sheet 1 is placed inside a watertightly sealed bag. Incisions or slots 2, 3, 4, and 5 are wide enough to provide space for welding tools, and a double weld 13, 14 is provided in the plastic material inside the slots. Between welds 13, 14 a slot 15 is provided in the plastic material.

Figure 3 shows a box or crate mounted from the blank of Figure 1. Corner flaps 16, 17, 18, and 19 are folded inside the end flaps, and corner flaps and end flaps are are joined by the aid of staples 20. A corresponding box may be manufactured by the aid of a blank, in which slots extend inwards from the edges at the ends.

Figure 4 shows a section of a waterproof box or crate blank which, in the same manner as disclosed in connection with Figure 1, consists of a sheet 21 of a non-waterproof material, which is on both sides coated by a plastic film 22, 23, the films being bonded at the edges 24 by the aid of a weld 25. This blank has no slots or incisions. It is only provided with folding lines 26 and 27 extending in parallel with the edges of the sheet, and a diagonal folding line 28 for forming a corner, as shown in Figure 5. The corner flap formed by folding lines 26, 27 is folded to form an inclined fold about folding line 28. In this manner completely waterproof corner joints are achieved in the box.

As will appear from Figure 1 of the drawing, slots 2, 3, 4, 5 extend into the blank past the longitudinal folding lines 6,7. In a folded box this extension will form drainage openings at the corners of the bottom. It will aslo appear from Figure 1 and the enlarged detail that slots 2, 3, 4, 5 are displaced relative to transverse folding lines 8, 9, so that the projections of said folding lines extend adjacent to the edge of the slots facing corner flaps 16, 17, 18, 19. The reason for this is that in this manner only a minimum of the material of the corner flaps is removed. Most of the blank material which has vertical corrugations in a mounted state and is, thus, most suited to absorb loads, will thus be maintained.

Figure 6 illustrates a blank 1 for mounting a crate or a box. As will appear from the drawing, slots 2, 3, 4, and 5 extend inwards from the short sides of the blank, as opposed to the blank of the cover, as shown in Figure 1, in which the slots extend inwards from the long sides of the blank. Both in Figure 1 and in Figure 6 the directions of corrugations of the corrugated paperboard are indicated. In both cases the directions of corrugations is transversal to the longitudinal direction of slots 2, 3, 4, 5. When the cover of Figure 1 is mounted, corner flaps 16, 17, 18, 19 are folded along the longitudinal sides of the blank, whereas flaps 16, 17, 18, 19 in the crate blank are folded along the short sides. In this manner three plies of paperboard are provided at the short sides, and almost the same in the longitudinal sides, dependent on the length of the longitudinal sides relative to the short sides. Corrugated paperboard has good insulating properties, and by coating the paperboard with tight layers on both sides insulation properties are further improved. By folding the flaps as mentioned above, very good insulation is achieved.

By choosing the direction of corrugation as explained above relative to the folding of corner flaps, corners having vertical corrugations in several plies are achieved. This provides packings which have a good capability of absorbing vertical loads. The same is true of the embodiment according to Figures 4 and 5.

Claims

1. A waterproof box or cover blank comprising a flat sheet (1) of corrugated paperboard which has folding lines (6, 7, 8, 9), and incisions (2, 3, 4, 5) forming corner flaps (16, 17, 18, 19), **characterized in** that blank (1) is on both sides provided with a waterproof plastic film (10,11) which films are joined by welding outside the external edges of the blank, and that the waterproof plastic film is loosely arranged i.e. not attached to the flat sheet of a non-waterproof material.

2. A box blank as stated in claim 1, **characterized in** that plastic films (10, 11) are bonded in slots (2,3,4,5) and split centrally in the slots, said slots having a width which is sufficient for welding and slotting tools.

3. A box blank as stated in claim 1 or 2, **characterized in** that the corrugations of the corrugated paperboard extend transversal to the direction of incisions.

4. A box blank as stated in claim 2, **characterized in** that slots (2,3,4,5) are displaced relative to the transversal folding lines (8,9), so that the projection of the folding lines is adjacent to the slot edge which is present at the corner flaps (16, 19, or 17, 18).

5. A box blank as stated in one of a number of

the preceding claims, **characterized in** that slots (2,3,4,5) project a distance inside the folding lines (6,7) extending in parallel with the lateral edges of the sheet.

Fig.1.

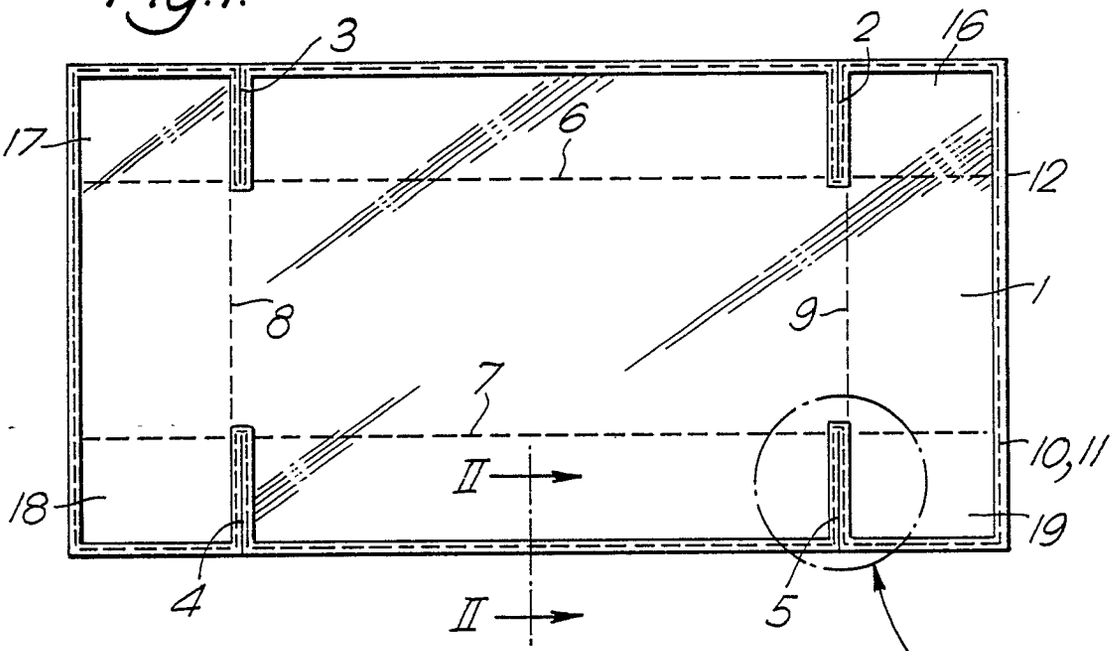
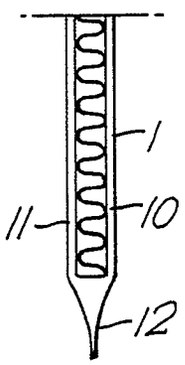


Fig.2.



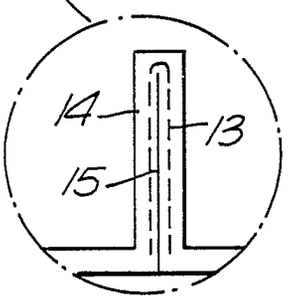


Fig.3.

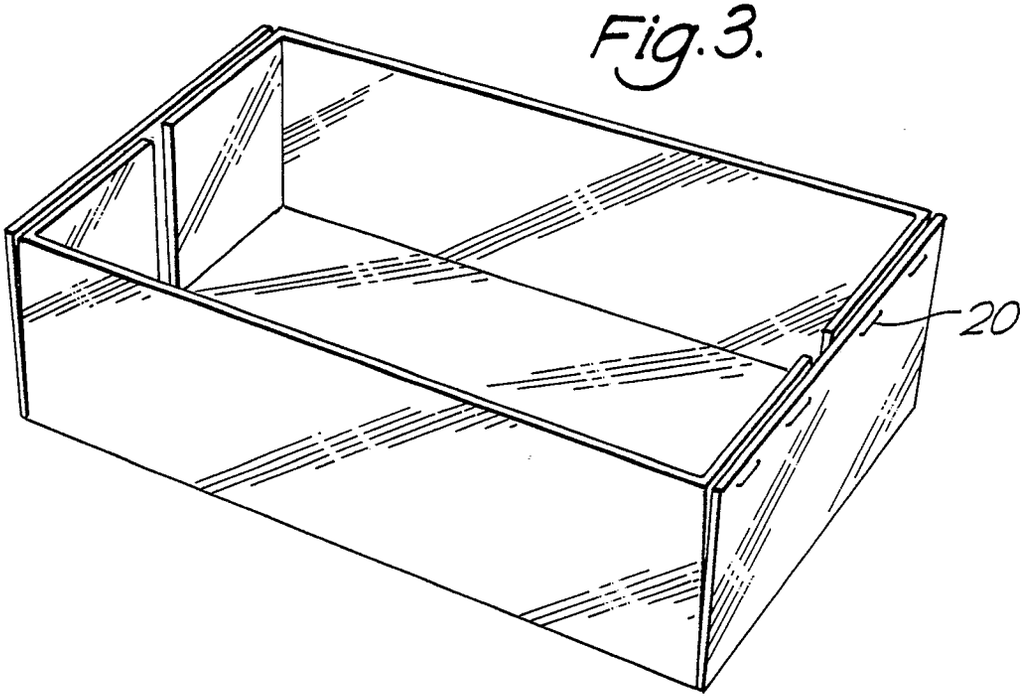


Fig.4.

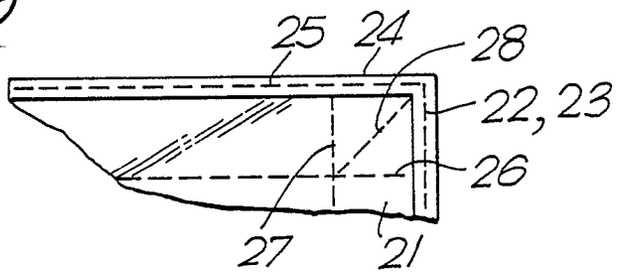


Fig.5.

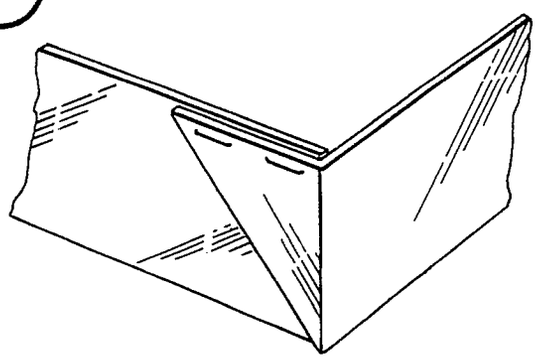
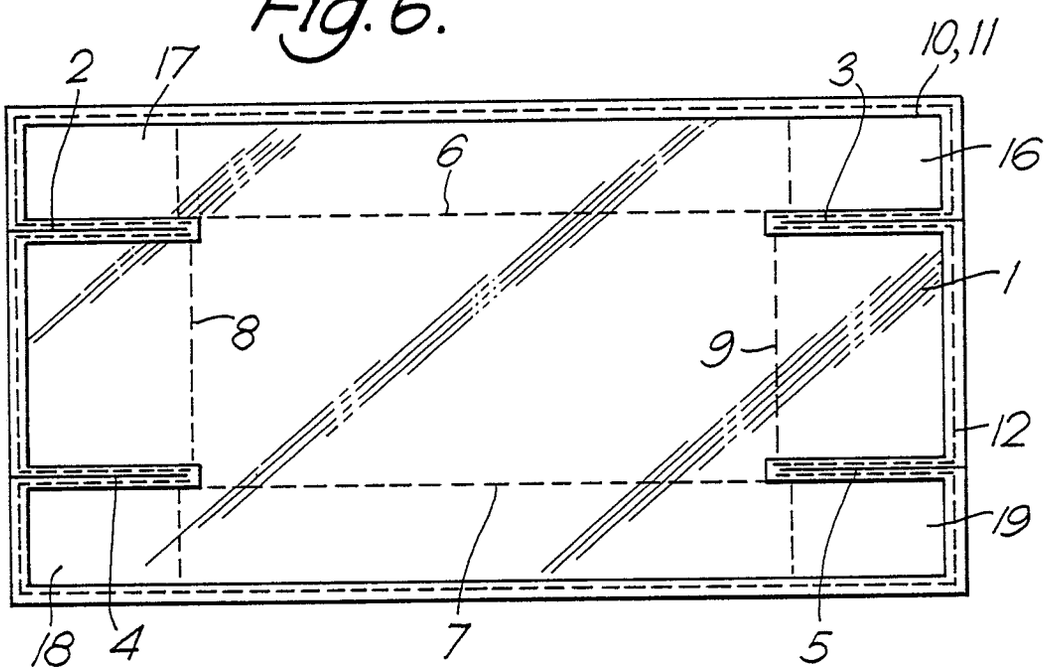


Fig.6.



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EUROPEAN SEARCH REPORT

Application Number

EP 89 85 0426

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.5)
A	FR-A-2 562 870 (DROPSY) * Page 2, lines 10-29; figures * ---	1	B 65 D 5/40
A	FR-A-1 354 026 (STAMICARBON N.V.) * Page 1, right-hand column, line 26 - page 2, left-hand column, line 13; figure 2 * -----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 65 D
B 31 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	21-02-1990	MARTINEZ NAVARRO A.

CATEGORY OF CITED DOCUMENTS

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