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㉔ Applicant: **L. GROSS (BOXES) LIMITED, West Street**
Denton, Manchester (GB)

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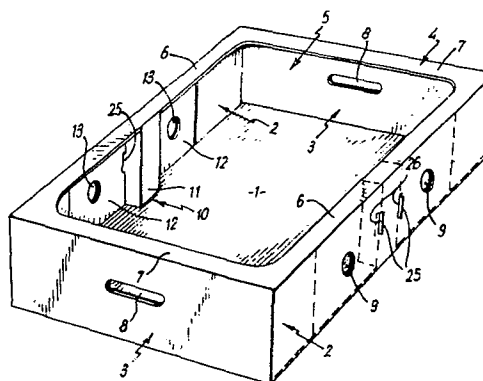
㉖ Inventor: **Aspey, Ronald, 20 Grasmere Avenue Ince,**
Wigan Lancashire (GB)

㉗ Designated Contracting States: **DE FR NL**

㉘ Representative: **Quest, Barry, M'CAW & CO. 41-51 Royal**
Exchange Cross Street, Manchester M2 7BD (GB)

㉙ **Boxes.**

㉚ An open-topped box, such as a box used for the packaging of tomatoes, is formed from sheet material, such as cardboard, and has a base (1), side walls (2, 3) and upper intumed rims (6, 7). For strengthening purposes, one or more struts (10) formed from folded sheet material are provided within the box between the base (1) and rims (6, 7). The entire box including the struts (10) may be formed from a single sheet of cardboard.



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BOXES

This invention relates to open-topped boxes formed from sheet material such as cardboard.

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Open-topped cardboard boxes are used for the packaging of tomatoes, such boxes affording protection for the goods during transport and storage thereof and also providing containers from which the tomatoes can be
10 displayed and dispensed for sale to customers.

Known such tomato boxes are formed from appropriately cut and folded cardboard sheets and have rectangular bases bounded by side walls, inwardly turned rims being
15 provided at the top edges of the longer side walls and flaps being folded back against the inner surfaces of the side walls. With these known boxes, the rims and flaps provide a reinforcing function but it has been found that, despite this, the overall strength is not
20 always adequate, particularly having regard to the fact that, in use, many heavily laden boxes may be stacked one on top of another; and it is not uncommon for partial collapse of boxes and consequent damage to the contents thereof to occur.

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An object of the present invention is to provide an open-

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topped box which has improved structural strength.

According to the invention therefore there is provided an open-topped box formed from sheet material and having
5 a base of rectangular planform bounded by upstanding first and second pairs of opposed side walls, at least one side wall of said first pair having an inturned rim at the upper edge thereof, characterised in that said at least one side wall has an upright reinforcing strut,
10 formed from folded said sheet material, extending on the inner side of said side wall between the base and the rim, which rim is attached to the opposed side walls of the said second pair.

15 With this arrangement it will be appreciated that considerable vertical strength can be derived from the strut and the rim whereby the tendency for boxes to collapse when heavily laden and stacked one upon another can be obviated or at least much reduced.

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In a particularly preferred embodiment, the two opposed longer side walls have rims thereto and are provided with respective said struts in the central regions thereof.

25 The or each strut may be defined by sheet material which is folded to form, in itself or together with the associated side wall, a hollow structure, particularly a hollow square-section tube.

30 If desired, all side walls may have inwardly turned rims thereto and these may be formed integrally with each other.

Most preferably, the box of the invention is formed from a single sheet of material and, in this case, the or each
35 strut may be formed from a flap which is cut from the

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region of the sheet which forms the open top of the box thereby to achieve economic usage of material.

Whilst the sheet material used in forming the box of
5 the invention will most preferably comprise cardboard
by itself or appropriately coated, it is of course to
be understood that the invention is not restricted to
this and any other suitable material or combination
of materials may be used. Also, whilst the box of
10 the invention is particularly suitable for use in the
packing of tomatoes, it can of course be used with
any other suitable goods.

The invention will now be described further by way of
15 example only and with reference to the accompanying
drawings in which:-

- Fig. 1 is a diagrammatic perspective view of one
form of a box according to the invention;
20 Fig. 2 is a plan view of a cut single sheet of
cardboard used in the manufacture of the
box of Fig. 1;
Fig. 3 is a diagrammatic perspective view of a
second embodiment; and
25 Fig. 4 is a sectional end elevation of the box of
Fig. 3.

With reference to Fig. 1, the box, which is intended for
use in the packaging of easily damaged goods such as
30 tomatoes or other fruit or the like, has a rectangular
base 1 bounded by four upstanding side walls 2, 3. The
box also has a top wall 4 with a central rectangular
portion 5 cut out therefrom to define integral inwardly
turned rims 6, 7 at the upper edges of the side walls
35 2, 3.

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The opposite shorter side walls 3 have elongate slots 8 therein to define handgrips. The opposite longer side walls 2 are provided with ventilation holes 9.

- 5 Within the box on the inner sides of the two longer side walls 2 there are reinforcing struts 10 defined by folded sheets. Each such folded sheet has a central vertical channel section 11 with flaps 12 on opposite sides. The flaps 12 lie against the inner side
10 of the pertaining side wall 2 and the channel section 11 defines with such side wall 2 a vertical square-section tube terminating at its upper end against the underside of the pertaining rim 6 and terminating at its lower end against the base 1. The flaps 12 have holes 13
15 therein which coincide with the ventilation holes 9 in the side walls 2. Secure location of the flaps 12 is achieved by engagement of projecting tabs 25 on the flaps with slots 26 in the side walls 2.
- 20 The box is manufactured from a box blank as shown in Fig. 2, which is appropriately cut and provided with fold lines. The box base 1 is defined by the region 14, the shorter side walls 3 are defined by strips 15 which fit over strips 16, and the longer side walls 2 are
25 defined by strips 17, 18 together with edge piece 19 which tucks on the inner side of the strip 17. Each strip 15 has end flaps 20 which tuck in against the inner sides of the strips 17, 18 to reinforce the corners and longer side walls 2 and to assist in holding the assembled
30 box structure together. A region 21 of the blank has a cut 24 in the centre thereof which is almost wholly rectangular and defines the rimmed open top of the box, such cut leaving two structures 22, held at positions 23. These structures 22 are provided with fold lines 27 and
35 slits 28 and can be folded to define the struts 10. In

the assembled box, the ends of the flaps 12 of the struts 10 abut the ends of the adjacent folded corner flaps 20.

- 5 The assembled box may be held together by stapling and/or glueing as appropriate.

The box can be assembled in a simple manner from the single box blank and it will be noted that little
10 wastage of material is involved, particularly because the struts 10 are formed by the structures 22 which are cut from the part of the region 21 of the blank which provides the open top of the box.

15 When assembled the box has great vertical strength as a consequence of the struts 10 which extend between the rims 6 and the base 1. Strength is of course also derived from other features of the box structure particularly the integral rim arrangement and the corner
20 flaps 20. Many heavily laden boxes can therefore be stacked one on top of another with little tendency for damage to be caused to the contents thereof due to partial collapse of the boxes.

25 It is of course to be understood that the invention is not intended to be restricted to the details of the above embodiment which are described by way of example only.

30 Referring now to Figs. 3 and 4, in which like parts are numbered as in the Figs. 1 and 2 embodiment, the box shown therein has a rim 6 attached to each long side wall 2, and both rims 6 are attached to both short side walls 3. The struts 10 are formed from the sheet material
35 which is cut to form the open top 5, thus providing for

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each strut 10 two upstanding portions 11 and two flaps 12 which are secured to the base 1 by adhesive or staples.

5 Obviously either of the strut formations shown in the figures can be used with either of the rim formations shown as desired for any particular box application.

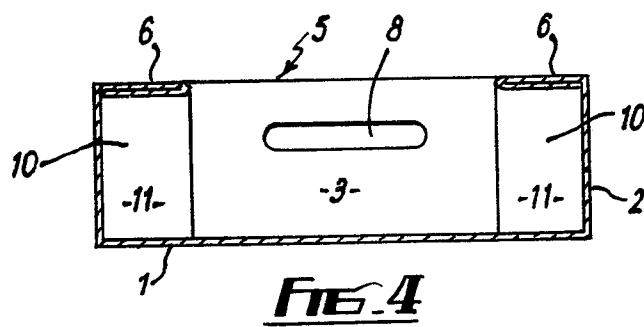
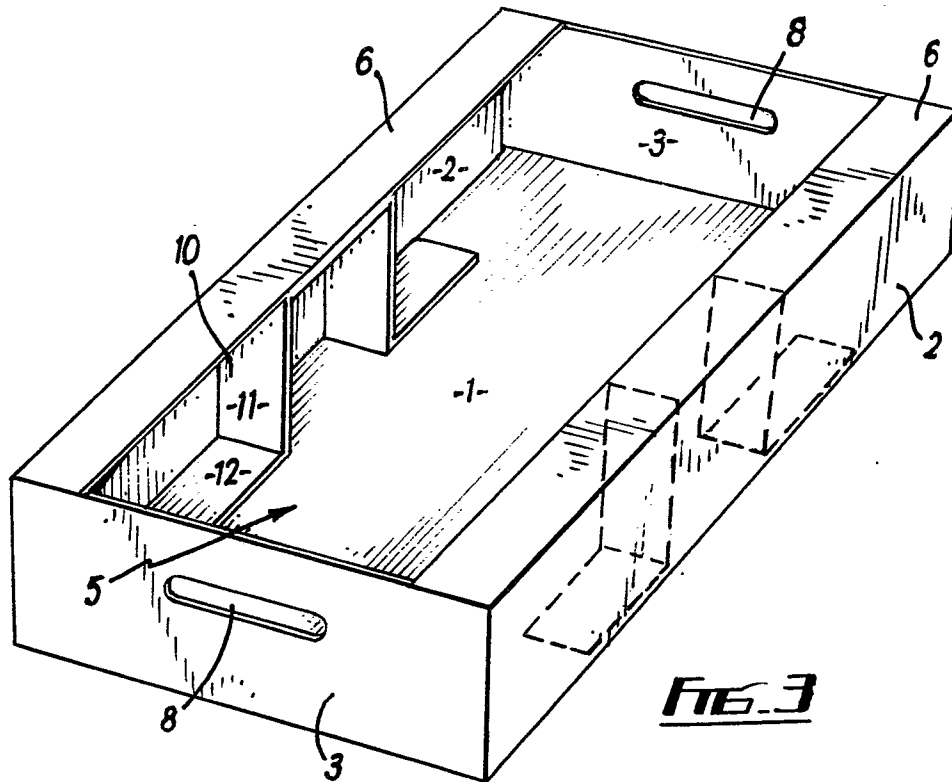
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Claims:

1. An open-topped box formed from sheet material and having a base (1) of rectangular planform bounded by upstanding first and second pairs of opposed side walls (2,3) at least one side wall (2) of said first pair having an inturned rim (6) at the upper edge thereof,
characterised in that
said at least one side wall (2) has an upright reinforcing strut (10), formed from folded said sheet material, extending on the inner side of said side wall (2) between the base (1) and the rim (6) which rim (6) is attached to the opposed side walls (3) of the said second pair.
15
2. A box according to claim 1,
characterised in that
two opposed longer said side walls (2) have rims (6) thereto and are provided with respective said struts
20 (10) in the central region thereof.
3. A box according to claim 1 or 2,
characterised in that
the or each said strut (10) is defined by sheet material
25 which is folded to form, in itself or together with the associated side wall (2), a hollow structure.
4. A box according to claim 3,
characterised in that
30 the hollow structure is a square-section tube.
5. A box according to any one of claims 1 to 4,
characterised in that
each side wall (2,3) has an inwardly turned rim (6,7)
35 thereto.

6. A box according to claim 5,
characterised in that
the rims (6,7) are formed integrally with each other.
- 5 7. A box according to any one of claims 1 to 6,
characterised in that
it is formed from a single sheet of material.
8. A box according to claim 7,
10 characterised in that
the or each said strut (10) is formed from a flap
which is cut from the region of the sheet which forms
the open top (5) of the box.
- 15 9. A box according to any one of claims 1 to 8,
characterised in that
it is formed from cardboard sheet material.
10. A box according to any one of claims 1 to 9,
20 characterised by
being packed with tomatoes or other fruit.
11. A blank of sheet material adapted to form a
box according to any one of the preceding claims,
25 characterised in that
said blank comprises a base portion (1) of
rectangular planform, portions forming first and second
pairs of opposed side walls (2,3) a top portion (4)
providing at least one rim portion (6) attached to a
30 side wall portion (2) of said first pair and to the
opposed side wall portions (3) of said second pair,
and a strut portion (10) attached to the or each rim
portion (6).





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EUROPEAN SEARCH REPORT

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Application number
EP 81 30 0481

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	<u>GB - A - 501 922 (GILL)</u> * The whole document * --	1-3,7, 9,11	B 65 D 5/44
X	<u>GB - A - 1 504 570 (ASHTON CONTAINERS LTD.)</u> * The whole document * --	1,2, 5-7,9	
X	<u>US - A - 2 998 908 (HARVEY)</u> * The whole document * --	1,7,9, 10	TECHNICAL FIELDS SEARCHED (Int. Cl.)
	<u>GB - A - 1 002 938 (HUGH STEVENSON & SONS LTD.)</u> * The whole document * --	5,6,7, 9,10	B 65 D
	<u>DE - A - 2 816 563 (VEREINIGTE VERPACKUNGSGESELLSCHAFT)</u> * Claims 1,2 * ----	3,4	
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
			&: member of the same patent family, corresponding document
The present search report has been drawn up for all claims Place of search The Hague Date of completion of the search 08-05-1981 Examiner BAERT			