

(12) **UK Patent Application** (19) **GB** (11) **2 207 881 A** (13)

(43) Application published 15 Feb 1989

(21) Application No **8817972**
 (22) Date of filing **28 Jul 1988**
 (30) Priority data
 (31) **3577** (32) **29 Jul 1987** (33) **IT**

(51) INT CL⁴
B31B 7/00 B65D 5/44

(52) Domestic classification (Edition J):
B5D 105 A17 P
B8P L5

(56) Documents cited
US 3965803

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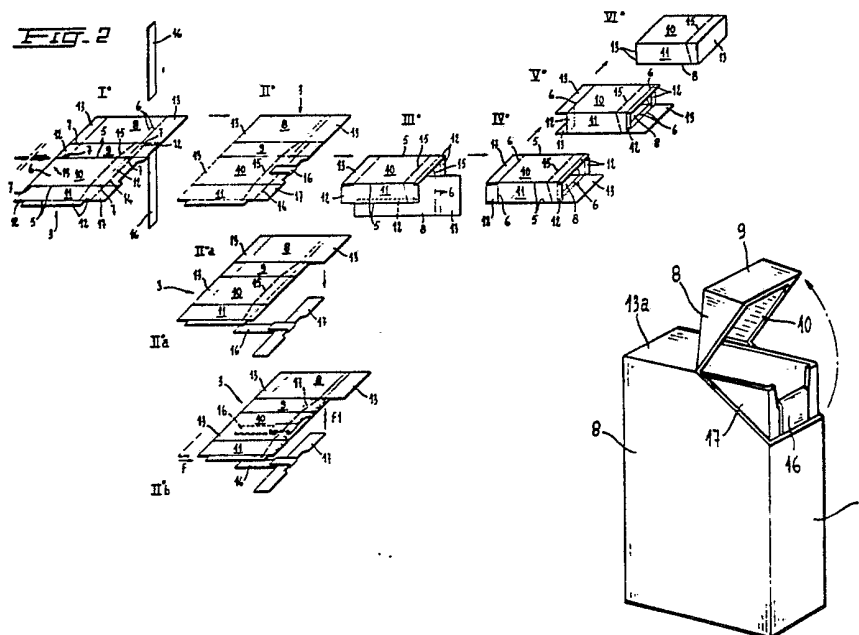
(58) Field of search
B5D
 Selected US specifications from IPC sub-class
B31B

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(54) **Box and process for its production**

(57) Sheets from a pallet (Fig 1) are separated into strips and then into individual plane blanks 3 which are supplied in individual succession to a box production line along which a respective portion 17 is separated along a break, lines 14 (position IIa) and reapplied to the remainder of the blank in a superimposed relationship (position IIb) to form a stiffening flange or collar in the completed box. The blank is thereafter folded around fold lines 5 and wall 8 glued to flap 12. Then end flaps 12, 13 are folded around lines 6 and glued to provide a sealed closure along a breakline 15 (Fig 4) which is overlapped by flange 17. Blank 3 intercepts an information carrying element 16 (position I) which is wrapped around portion 17 of the blank (position II) so as to be detached therewith.



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FIG. 1

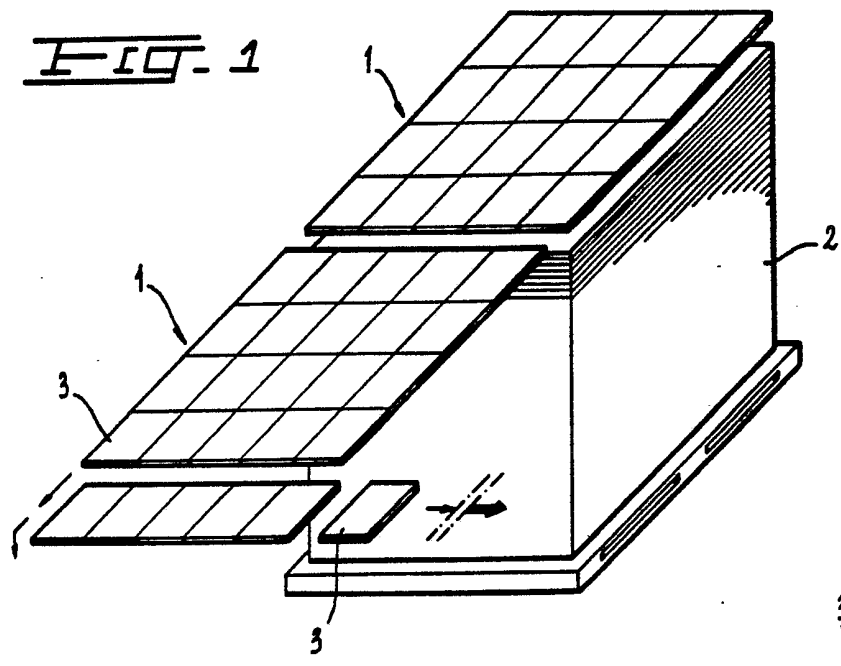


FIG. 3

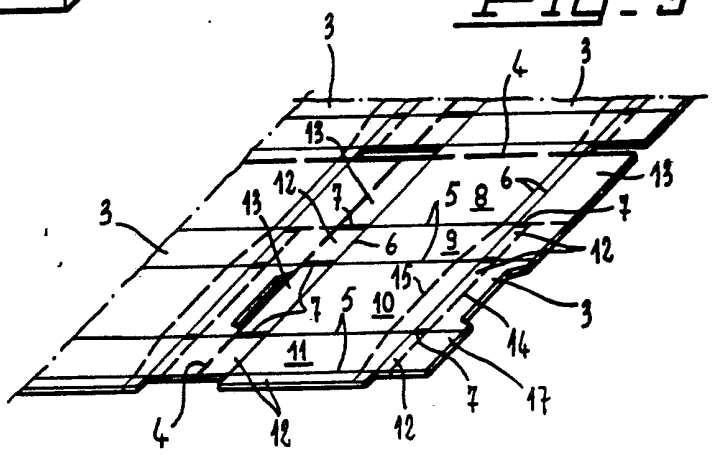


FIG. 4

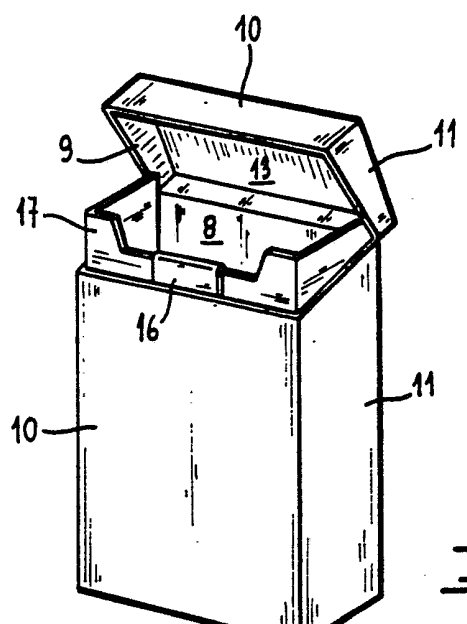
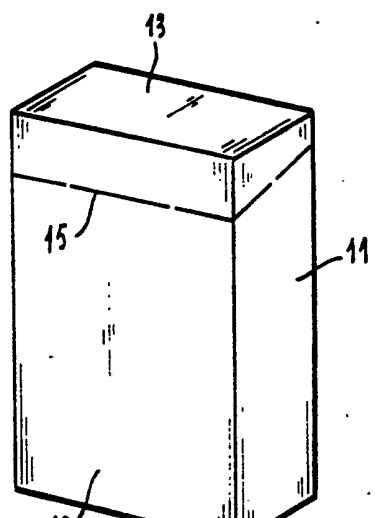


FIG. 5

FIG. 1A

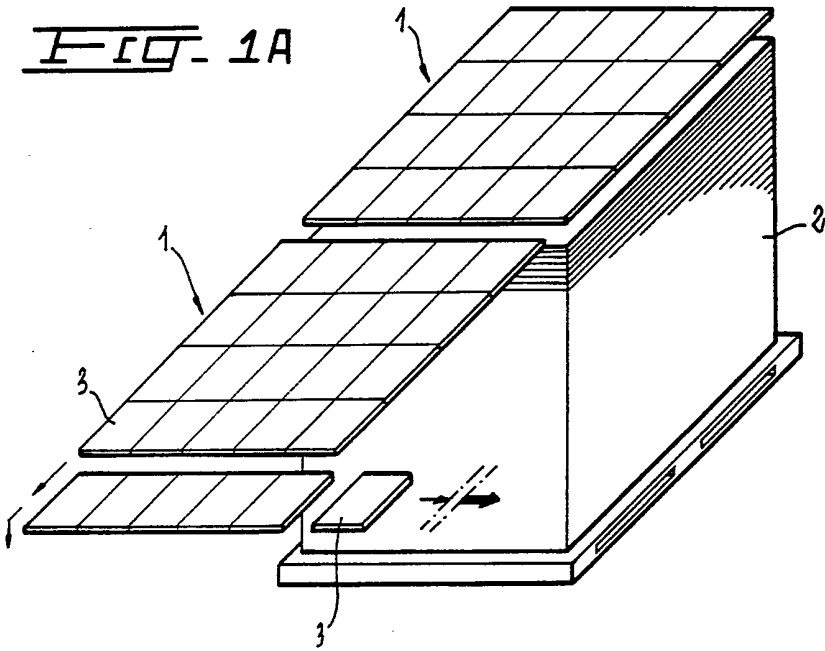


FIG. 3A

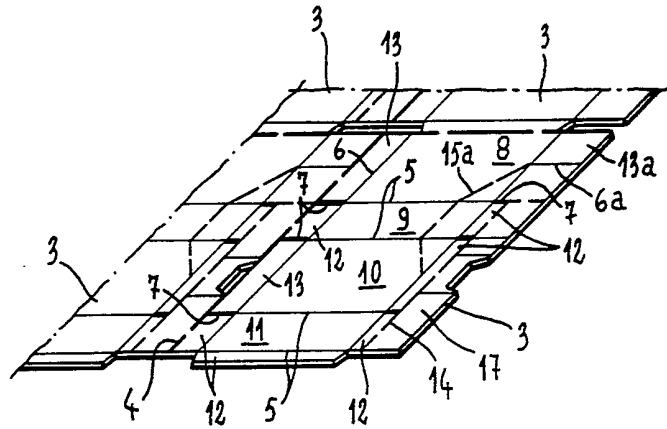


FIG. 4A

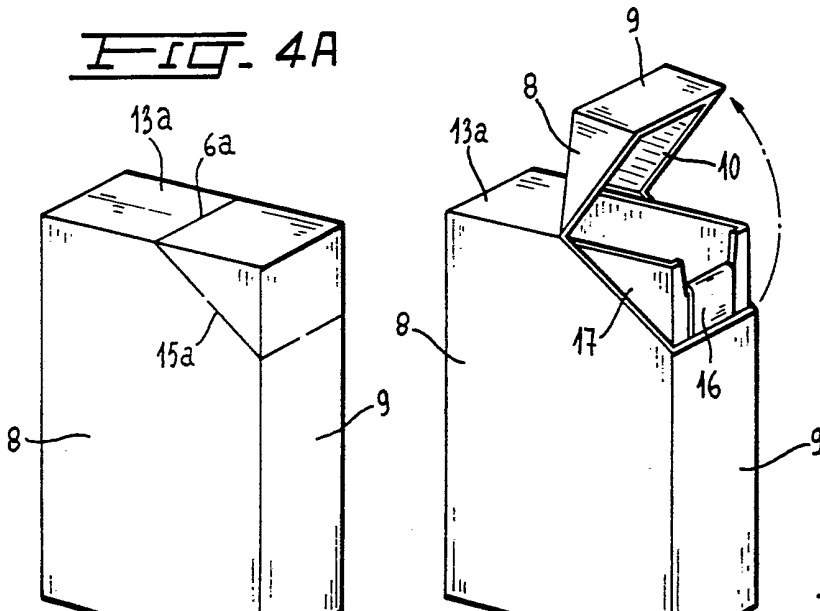
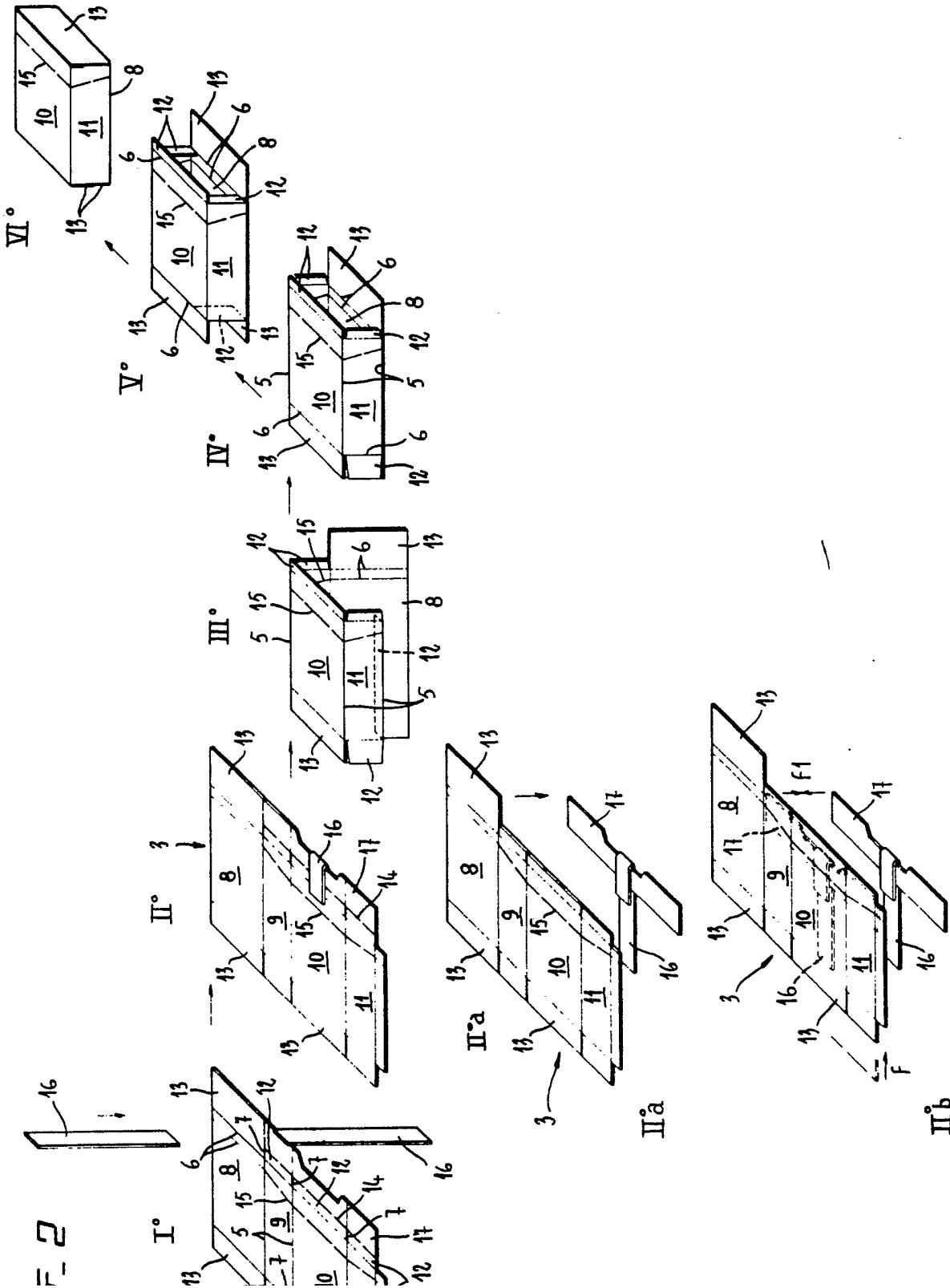
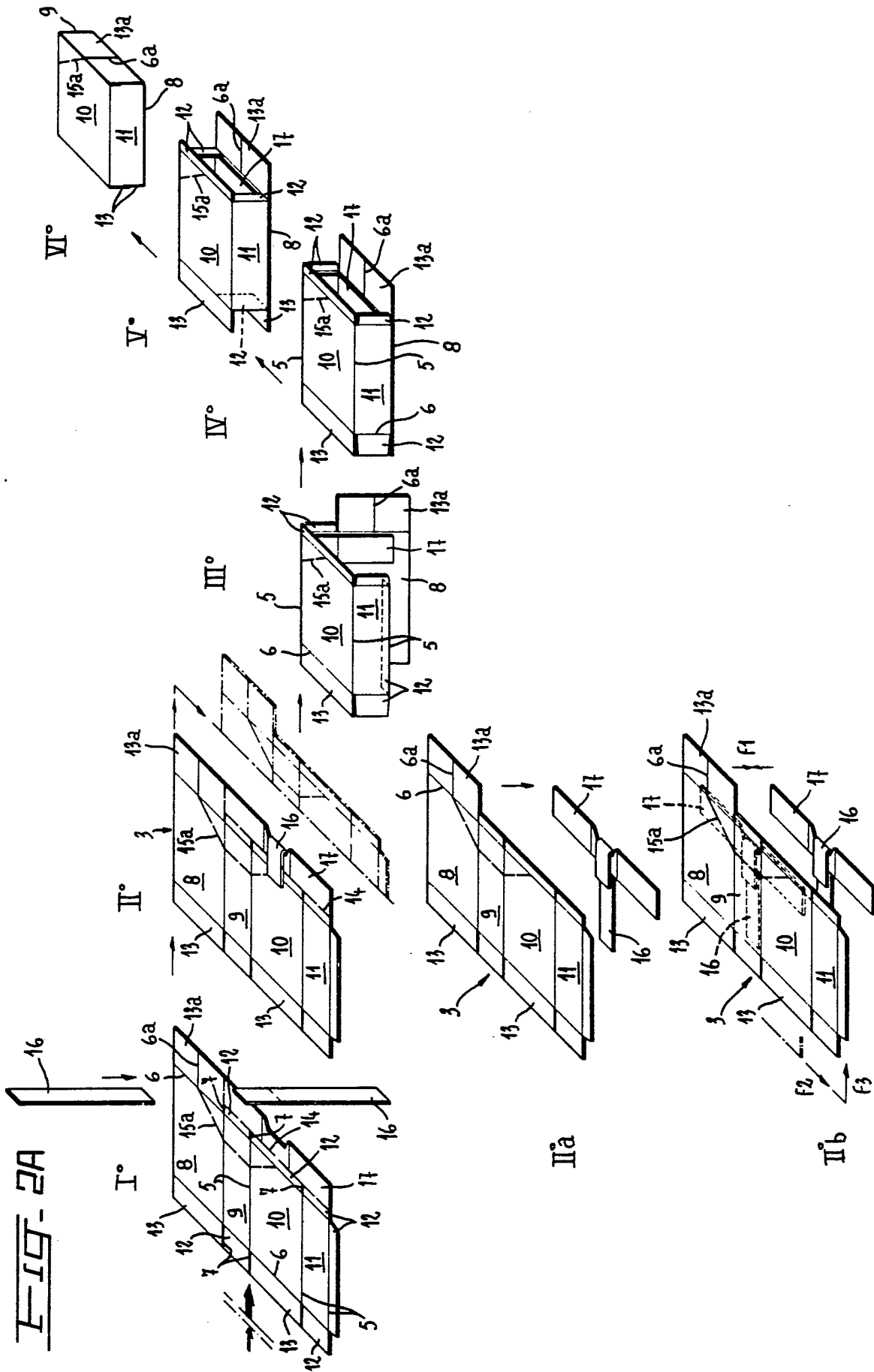


FIG. 5A





BOX AND PROCESS FOR ITS PRODUCTION

The present invention relates to a method for the production of packaging boxes and the packaging boxes obtained with this method.

In the field of the packaging or wrapping of foodstuffs, household products such as detergent powders, pharmaceuticals and the like it is known to use prefabricated boxes in a flat folded tubular shape. The boxes are supplied to the packaging machines for these products by taking them up in individual sequence from a store, usually of the hopper type, in which they are stacked, erecting them so that the product to be packaged can be supplied thereto and thereafter closing the ends or heads.

Known processes for obtaining these boxes comprise a first step for the preparation of the sheets. Each sheet is stamped with a plurality of plane blanks joined by breakable connections. The blanks are also provided with notches defining the panel members. The sheets are placed in stacks with superimposed layers. Next the stacks are manually transferred to a supply hopper from which blanks are taken up individually. The blanks are folded and glued for supply as packages for foodstuffs, household products, such as detergent powders and pharmaceuticals and the like.

The machines for carrying out the above process are relatively complex and extremely costly.

The invention provides a packaging box of the so-called flanged type without having to make use of an appropriate supply of the material needed for the formation of this flange.

An object of the present invention is thus to provide a method for the production of packaging plane stamped members or blanks in individual sequence starting from pallets of sheets with a plurality of stamped elements.

Preferably, individual plane stamped members or blanks supplied are produced in individual sequence in their tubular shape for the product(s) to be packaged as they are fed along a production line.

More preferably the packaging box has a sealed closure guaranteeing the product(s) contained therein.

Some embodiments of the invention allow the implementation of the process in an automatic manner by means of a particularly simple discontinuously or continuously operating machine with high productivity per unit of time and a relatively low cost in particular in the light of the results which can be achieved therewith.

In one embodiment the invention there is provided a method of producing boxes for the packaging of foodstuffs, household products such as detergent powders, pharmaceuticals and like, starting from pallets of sheets of board each comprising stamped therein a plurality of plane blanks joined together in adjacent transverse and longitudinal strips by connections which can be broken and

are provided with notches, fold lines and break lines defining the members for producing and closing these boxes, which method is characterized in that it comprises a sequence of steps including the sequential take up from the pallet of these sheets with multiple adjacent strips of plane stamped elements or blanks, the sequential separation at the location of the respective break members of these strips of multiple plane stamped members or blanks from the sheet of multiple strips taken from the pallets, the sequential separation, also at the location of the respective break members, of these plane stamped members or blanks from these strips of multiple stamped members or blanks, the supply in individual sequence of these plane stamped members or blanks separated from the strips with multiple blanks, the detachment of a portion from these individual plane stamped members or blanks supplied in sequence at the respective break line and the application of this portion to the respective individual plane stamped members designed to form the relative flange of the corresponding box, the folding about the respective fold lines of these plane stamped members and the associated gluing of the respective member for the production of the latter in their tubular shape to contain the product(s) to be packaged and the folding of the members for producing and closing the opposite ends or heads by gluing providing boxes of the flanged type with a sealed closure guaranteeing the product(s) contained therein along the relative break line.

A particular feature offered by the method of the invention is that of being able to package the product(s) during the production of these boxes by folding the relative blanks around the corresponding products to be packaged, or by inserting these products through one end after the blanks have been produced in their tubular shape, even after the closure of one of these ends, or at any time after.

The invention will be illustrated in detail in the following description of two preferred embodiments given by way of example with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of the pallet of sheets of plane stamped members or blanks from which these sheets are progressively taken up in individual sequence for the individual supply of these plane stamped members or blanks in accordance with the method of the present invention;

Figure 2 is a further perspective view on an enlarged scale of the sequence of stages for the production of the individual plane stamped members or blanks as packaging boxes in accordance with a preferred embodiment of the present invention;

Figure 3 is a further perspective view showing in diagrammatic form and on an enlarged scale a detail of the structure connecting the stamped members or blanks in the sheets of multiple stamped members or blanks;

Figure 4 and 5 are perspective views of closed and

open boxes obtained with the above method and

Figure 1a to 5a are views similar to Figs. 1 to 5 for the production of a box in accordance with a second embodiment of the present invention.

As mentioned above, one advantage of the present invention is that it can provide packaging boxes starting directly from the pallet of sheets with multiple plane stamped members or blanks without having to pass, as is currently the case, through the extremely costly stage for the production of these plane stamped members or blanks in the flat folded tubular shape prior to their use for packaging purposes.

Palletized sheets 1 of board shown in Figure 1 each comprise a plurality of plane blanks 3 defined by break lines 4 connected together in adjacent transverse or longitudinal strips by breakable connection members which can be seen in Figure 3 along the break lines 4. The lateral walls 8, 9, 10, 11 and the production members 12 and closure members 13 for the boxes are defined in these plane blanks 3 by longitudinal fold lines 5, transverse fold lines 6 and notches 7 (see in particular Figure 3 and Figure 2, position I). Break lines 14 and 15 are also provided in these plane blanks 3 for the reasons which will be explained in detail in the following description.

The sheets 1 are taken up sequentially from the pallet 2 (see Fig. 1), divided sequentially into transverse or longitudinal strips with a plurality of blanks along the respective break lines 4 and the strips

are divided, still sequentially, at the corresponding break lines 4 into individual blanks 3 (see Figure 1 in particular) so as to be supplied in individual sequence along a production line for the packaging therein of a product.

The individual blanks 3 are supplied along this production line as shown by way of example in Figure 2 and are subjected to a sequence of steps which have been shown by way of example as positions I, II, IIa, IIb, III, IV, V and VI for the implementation of these steps. In position I, for example, while the blank 3 is being advanced it intercepts an element 16 containing information on the product to be packaged. The element 16 is thus disposed about the blank as shown in position II. In a stage subsequent to that shown in position II, a portion 17 of the blank 3 is detached plane blank 3 along the break line 14 (position IIa) when the box is packaged in the manner to be described below. In position IIb the plane blank 3 is in the direction of the arrow f above the detached portion 17 and information element 16 assembly, or, alternatively, the assembly 17-16 is moved rearwards below the plane blank 3. In either case the detached portion 17 and the remainder of the blank 3 are superimposed together via a movement in the respective direction(s) of the arrow f1 in the way shown in dashed lines in position IIb.

In position III and IV the plane blank 3 prepared in this way is folded over the respective fold lines 5 and the wall 8 is glued to the corresponding member 12 for its

erection. In positions V and VI the production members 12 and closure members or heads 13 are folded over the respective fold lines 6 and glued to one another providing boxes of the type with a gusset flange 17 and a sealed closure along the break line 15 guaranteeing the product contained therein (see Figures 4 and 5).

The method of production of packaging boxes may be carried out automatically or using a discontinuously or a continuously operating machine for packaging the product(s) into the box. In the latter case the product is packaged during the box production by folding the relative blanks around the corresponding products to be packaged. In a discontinuous process the products are inserted at stage IV or V or at any other convenient step, through the end opposite that with the guarantee seal which is kept open and then subsequently sealed.

The embodiment of the invention shown in Figures 1a to 5a differs from that described above with reference to Figures 1 to 5 in that the gusset flange closure is provided at one corner of the box with a lid hinged about a fold line transverse to the head of this lid. The member, the transverse fold line forming the hinge and the break line which defines a lid of this type in the corresponding plane stamped member or blank 3 are indicated by the same reference numerals as in the previous embodiment described with reference to Figures 1 to 5 with the addition of a lower case a, i.e. by 13a, 6a and 15a respectively. In the stage corresponding to

position IIb, in addition to the feed movement for the plane blank 3 provided in the previous embodiment it is also moved in the same plane in the longitudinal direction, i.e. in the case shown, out of the plane of the paper (see arrows f2 and f3 in position IIb in this Figure).

CLAIMS

1. A method for the production of a packaging box for household products, the method comprising feeding a sequence of individual flat blanks along a production line, detaching a portion of each blank and reapplying the detached portion to the remainder of the blank in a superimposed relationship to provide a gusset or stiffening flange in a completed box, and folding the blank along predetermined fold line to form the box.
2. A method according to claim 1 in which each blank is initially severed from a strip of blanks, the strip of blanks having been severed from a sheet of blanks.
3. A method to claim 1 or claim 2 inw hich the box has a sealed closure defined by a break line, the detached portion of the blank overlapping the break line when the detached portion and the remainder of the blank are superimposed on one another.
4. A method according to any one of the preceding claims in which the detached portion of the blank and the remainder of the blank are moved relative to one another.
5. A method as claimed in claim 4 wherein the relative movement is in the plane of the blank.
6. A method as claimed in claim 4 wherein the relative movement is perpendicular to the plane of the blank.
7. A method as claimed in any one of claims 4 to 6 in which, prior to detaching the said portion of the blank, the portion intercepts an element carrying information and transversing the path of the blank.

8. A method as claimed in claim 7 wherein in the completed box the information element is disposed detachably astride the gusset or stiffening flange.

9. A box made by a method according to any one of claims 1 to 8.

10. A box as claimed in claim 9 wherein the closure comprises a guarantee seal and provided between a hinged lid and the body of the box.

11. A method for the production of boxes substantially as described herein.

12. A method for the production of boxes substantially as described herein with reference to any one or more of figures 1 to 5.

13. A box substantially as described herein with reference to figure 4 or 5.

14. A blank for a box substantially as described herein with reference to figure 3.

15. Method for the production of packaging boxes for foodstuffs, household products such as detergent powders, pharmaceuticals and the like starting from pallets of sheets of board each comprising stamped therein a plurality of plane blanks joined in adjacent transverse and longitudinal strips by members which can be broken and are provided with notches, fold lines and break lines defining the members for producing and closing these boxes, characterized in that it comprises a sequence of steps including the sequential take up from the pallet of these sheets with multiple adjacent strips of plane stamped

elements or blanks, the sequential separation at the location of the respective break members of these strips of multiple plane stamped members or blanks from the sheet of multiple strips taken from the pallet, the sequential separation, also at the location of the respective break members, of these plane stamped members or blanks from these strips of multiple stamped members or blanks, the supply in individual sequence of these plane stamped members or blanks separated from the strips with multiple blanks, the detachment of a portion from these individual plane stamped members or blanks supplied in sequence at the respective break line and the application of this portion to the respective individual plane stamped members designed to form the relative flange of the corresponding box, the folding around the respective fold lines of these plane stamped members and the gluing of the respective member for the production of the latter in their tubular form to contain the product(s) to be packaged and the folding of the members for producing and closing the opposite ends or heads by gluing providing boxes of the flanged type with a sealed closure guaranteeing the product(s) contained therein along the relative break line.