

SPECIFICATION

Method for the Manufacture of a Pack, in Particular for Eggs

The invention relates to a method for the manufacture of a pack, in particular for eggs.

One embodiment of the pack itself, to which the present invention relates, is already described in GB PS 1,479,523. The method of manufacture described therein was based on the fact that in a continuous method a band of cardboard withdrawn from a storage roller is given a corrugated shape, this corrugated band is then connected to a smooth band of cardboard withdrawn from a roller, the latter is then slit, the pack erected and filled and only then is it divided into individual, separate packaging units.

Nevertheless, there is a need to print the outer side of the pack. The printing can be carried out on the roll, but solely in a flat condition before connection to the corrugated web. This again involves the drawback that when cutting off the finished pack, as a result of the inevitable tolerances as regards length, the faults are added together and finally printing no longer coincides with the spacing of the packs. Furthermore, a line of machines of this type is very long, which makes installation in existing buildings difficult or even prohibitive.

Furthermore, it has proved desirable to manufacture the pack in a central cardboard factory and then to distribute the packs empty to the actual egg packing stations, which are spread around the country.

The invention intends to achieve the object of providing a method for the manufacture of egg packs of the aforementioned type, in which finished, printed, empty, non-bulky packs are produced in a first factory, which are then erected and filled in a second factory generally remote therefrom.

The invention provides a method for the manufacture of a pack, in particular for eggs, comprising the following steps, not necessarily performed in sequence;

(a) manufacturing a first elongate flat cardboard blank with five longitudinal strips extending in the longitudinal direction thereof, with a transverse strip at each end of said blank holding together the respective ends of said strips;

(b) manufacturing a second elongate cardboard blank which is longer than the first blank and comprises slots which are discontinuous and extend in the longitudinal direction along four parallel lines, and forming bending edges extending transversely thereof;

(c) forming corrugations in the second blank and securing the latter to the first blank along a bottom part of each corrugation;

(d) collapsing the corrugations thus forming a flattened scale-like structure;

(e) separating any attached points along the separate longitudinal strips of the first blank;

(f) removing the two transverse strips on the

first blank.

Due to this it is possible to manufacture packs of this type very rationally, whilst dispensing with a high space requirement for machinery. In addition, it is unnecessary for the speed of manufacture of the pack to coincide with the speed at which eggs are packed. The empty packs have only a low space requirement and therefore can be distributed with low transportation costs to packing stations, which may be relatively far apart.

In the drawings, stages of the method are shown diagrammatically by way of example and are described in detail hereafter:

Fig. 1 is a plan view of a first cardboard blank;

Fig. 2 is a plan view of a second cardboard blank, from which the corrugated band is subsequently formed;

Fig. 3 is a perspective view of the pack, in which the first cardboard blank is stuck to the corrugated band;

Fig. 4 is a perspective view of the pack with the corrugations laid flat;

Fig. 5 is a diagrammatic illustration of the cutting tools for cutting off the transverse strips at the ends of the first cardboard blank;

Fig. 6 is a perspective illustration of the partially erected pack;

Fig. 7 is a vertical section through the pack partly erected according to Fig. 6;

Fig. 8 is a vertical section through the finished pack;

Fig. 9 is a perspective view of the finished pack filled with eggs; and

Fig. 10 is a diagrammatic illustration of the apparatus for cutting off undesirable spots of glue.

Flat sheets of cardboard or cardboard bands are printed with the desired patterns and lettering and then first strip-like, rectangular blanks 2 as shown in Fig. 1 are cut out of the latter. These blanks 2 later provide the outer surfaces of the packs. They comprise five longitudinal strips 3 extending parallel to each other and in the longitudinal direction of the blank, which are separated from each other and remain connected solely by a transverse strip 4 respectively present at each end. The central strip 3a is twice as wide as the two outermost longitudinal strips 3b. The two longitudinal strips 3c located therebetween are each wider than the central longitudinal strip 3a.

Second, rectangular, strip-like blanks 5 as shown in figure 2 are cut from a further roll or from a flat sheet of cardboard. Discontinuous slots 6 extending in the longitudinal direction are provided simultaneously or in a subsequent operation. These slots are located along four parallel lines extending in the longitudinal direction. They are interrupted by transverse bending strips 7, which form the subsequent tops of the corrugations. These transverse bending strips 7 are perforated, grooved or weakened in some other way, so that they bend more easily. These perforations 8 form a double line with a

mutual spacing of preferably approximately 6mm. Located between two transverse bending strips 7 forming the tops of the corrugations is a strip 9 forming the bottom of the corrugation, which strip 9 is limited by bending edges 10 or perforations. Each of these strips 9 forming the bottom of the corrugation is subsequently stuck to the first blank 2.

In the second blank 5, corrugations 13 according to figure 3 are then formed in succession by shaping tools, in which case the transverse bending strips 7 form the tops of the corrugations and the strips 9 form the troughs of the corrugations alternately and thus extend at right angles to the longitudinal direction of the blank 5. The blank 5 which is longer than the first blank 2 in the flat condition is thus made shorter when the corrugations are formed.

After this the first flat blank 2 is connected to the blank 5 which is now corrugated. For this purpose, traces of adhesive extending at right angles to the longitudinal direction are applied to the first blank 2 respectively in the region of the strip 9 forming the bottom of the corrugation on the other blank 5, so that the blank 5 provided with corrugations and laid thereon is stuck by its strips 9 forming the troughs of the corrugations, as shown in figure 3.

In order to save space at the time of transportation, the corrugations are laid flat so that a scale-like structure as shown in figure 4 results. In order that the scales lie as flat as possible, certain relationships have to be maintained in the corrugations. Twice the length of the inclined part 11 of the corrugation minus the width of the transverse bending strip 7 forming the top of the corrugation should correspond to the spacing of the bending lines at the bottom of the corrugation. The perforations 8 facilitate the formation of the corrugations. Collapsing of the corrugations takes place in such a manner that a movement directed obliquely downwards is exerted by a mechanical finger on one edge of each top of the corrugation, due to which all the corrugations bend in at the same time.

When applying the adhesive to the first blank 2 by glueing wheels, then undesirable mutual sticking of the longitudinal strips 3 at right angles to the longitudinal direction of the blank 2 may occur due to residues of glue. In order that these glued points are not troublesome when the pack is subsequently erected, these undesirable glued points between the longitudinal strips 3a, 3b, 3c are broken. This is carried out in a manner such that the pack is either bent slightly at right angles to its longitudinal direction, due to which the individual glued points between the longitudinal strips are broken, or, however, according to figure 10 the pack is guided between rollers 24, 25, which are provided with projections 26 and corresponding recesses 27, so that breaking open of the undesirable glued points is achieved as a result, if the pack is guided between the rollers at right angles to its longitudinal direction, in the

direction of arrow C.

Since the transverse strips 4 are no longer required after sticking the two blanks 2, 5 together, they are cut off at both ends in order to facilitate subsequent erection of the pack. This is carried out by tools 12 in the form of shear blades, as illustrated diagrammatically in figure 5.

After this the scale-like pack can be squeezed between two rotating rollers, in order that it is in the flattest possible condition taking up very little space.

The empty packs manufactured in this way may then be stored or transported to distant packing stations. In this case, the corrugations 13 are re-erected by mechanical fingers and then the two lateral parts 20 of the pack are bent upwards through 90° about bending edges 14 so that a structure having an approximately U-shaped cross section is produced, as shown in figures 6 and 7.

After this, the objects to be packed, in particular eggs 16, are inserted from above in the direction of arrow A in the pockets formed by the troughs of the corrugations. Then, the two upper parts 21 of the pack are bent through 90° towards each other about bending edges 18 in the direction of arrows B. The connection in the region of the joint 22 can be made either by adhesive strips 28, drops of glue or flaps which are bent out of the cardboard material, folded over and glued. After this, the full pack is ready for the shops. In place of eggs, it is also possible to pack flower-bulbs or the like.

Patent claim 1 is to be understood in that the given sequence of manufacturing steps is not compulsory. In particular, the transverse strips could be cut off before the bending of the corrugations and before breaking the glued points. In addition, if need be, breaking of the glued points may take place before the corrugations are pressed flat.

Claims

1. A method for the manufacture of a pack, in particular for eggs, comprising the following steps, not necessarily performed in sequence;

(a) manufacturing a first elongate flat cardboard blank with five longitudinal strips extending in the longitudinal direction thereof, with a transverse strip at each end of said blank holding together the respective ends of said strips;

(b) manufacturing a second elongate cardboard blank which is longer than the first blank and comprises slots which are discontinuous and extend in the longitudinal direction along four parallel lines, and forming bending edges extending transversely thereof;

(c) forming corrugations in the second blank and securing the latter to the first blank along a bottom part of each corrugation;

(d) collapsing the corrugations thus forming a flattened scale-like structure;

(e) separating any attached points along the separate longitudinal strips of the first blank;

(f) removing the two transverse strips on the first blank.



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After this the first flat blank 2 is connected to the blank 5 which is now corrugated. For this purpose, traces of adhesive extending at right angles to the longitudinal direction are applied to the first blank 2 respectively in the region of the strip 9 forming the bottom of the corrugation on the other blank 5, so that the blank 5 provided with corrugations and laid thereon is stuck by its strips 9 forming the troughs of the corrugations, as shown in figure 3.

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Claims

1. A method for the manufacture of a pack, in particular for eggs, comprising the following steps, not necessarily performed in sequence;
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 - (b) manufacturing a second elongate cardboard blank which is longer than the first blank and comprises slots which are discontinuous and extend in the longitudinal direction along four parallel lines, and forming bending edges extending transversely thereof;
 - (c) forming corrugations in the second blank and securing the latter to the first blank along a bottom part of each corrugation;
 - (d) collapsing the corrugations thus forming a flattened scale-like structure;
 - (e) separating any attached points along the separate longitudinal strips of the first blank;
 - (f) removing the two transverse strips on the first blank.



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2. A method according to claim 1 wherein the manufacturing of the first elongate flat blank is by stamping.

5 3. A method of packaging articles in a pack manufactured according to claim 1 or claim 2, characterised by the following successive steps:

(g) erecting the corrugations;

10 (h) bending the laterally outer parts of the pack upwardly to form pockets which are open at the upper side thereof; and

(i) inserting the objects to be packed in the pockets, bending over the uppermost parts of the

pack towards each other and securing the thus erected pack at a joint formed by the adjacent edges of the uppermost parts.

15 4. A method for the manufacture of a pack substantially as hereinbefore described with reference to and as illustrated in Figures 1 to 5 of the accompanying drawings.

20 5. A method of packaging articles in a pack manufactured according to the method of claim 4 substantially as hereinbefore described with reference to and as illustrated in Figs. 6 to 9 of the accompanying drawings.