United States Patent

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[54] **CARTON BLANK**
6 Claims, 6 Drawing Figs.

[52] **U.S. Cl.** ..... **229/31 R,** 229/35

[51] **Int. Cl.** **B65d 5/24,** B65d 5/26

[50] **Field of Search** ..... 229/35, 31 R, 32; 93/51

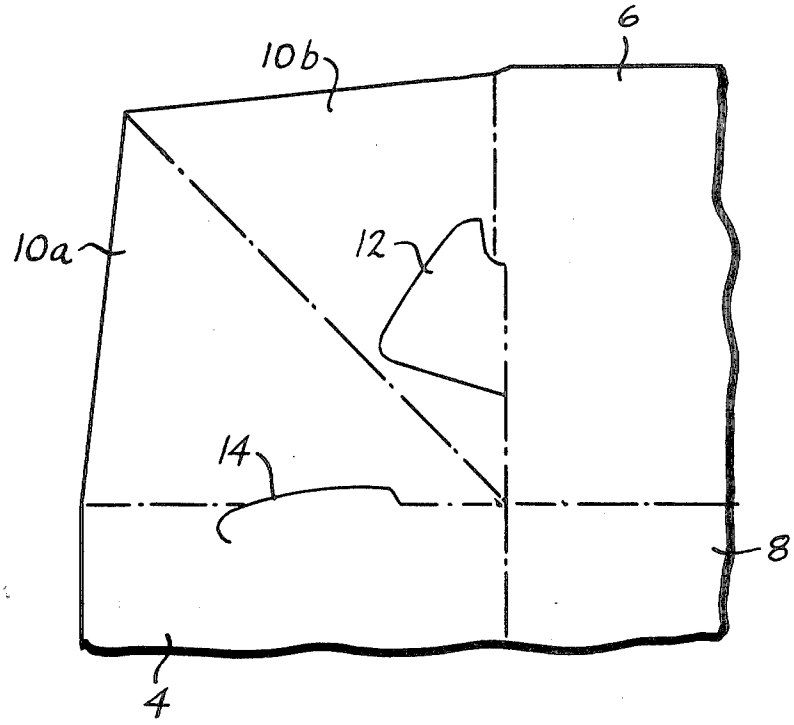
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ABSTRACT: The invention is for a blank for a carton. The blank has score or fold lines so that the blank may be folded into a bottom panel, wall panel and a corner panel. Then, one of the wall panels is so cut as to project into the corner panel to form a locking tab. This locking tab is integral with the adjacent wall panel. In the other wall panel, adjacent to the same corner panel, there is a locking slit which is both in the corner panel and said wall panel. Upon folding the carton blank, the locking tab slips into the locking slit so as to lock the wall panels in a substantially normal position with respect to the bottom panel to form a carton for holding objects such as bakery good, meat and the like.



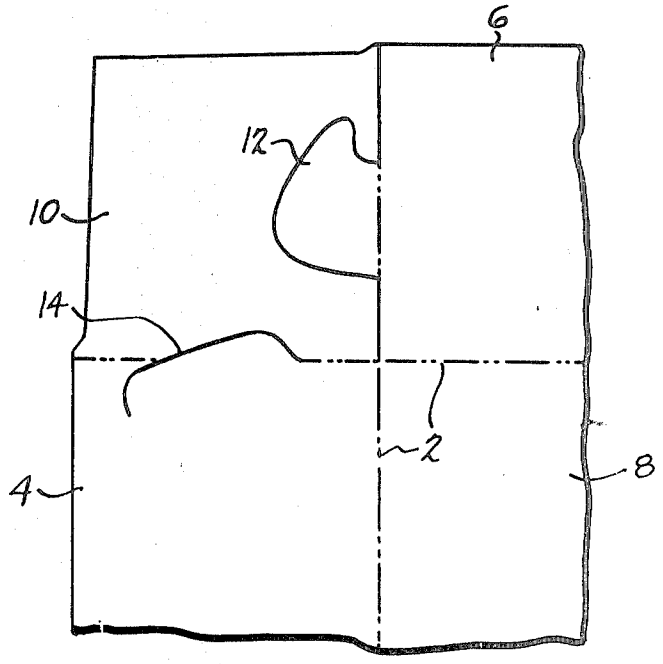


FIG. 1

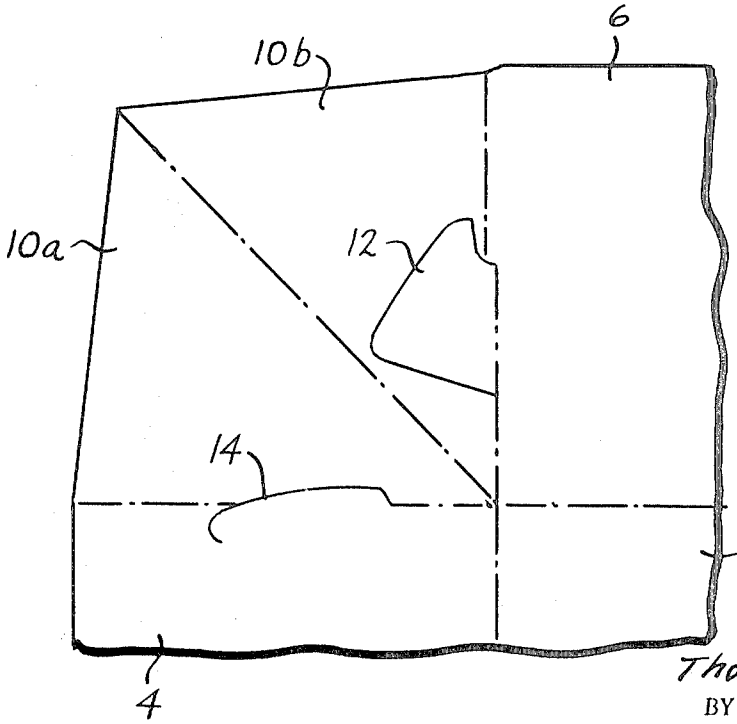


FIG. 2

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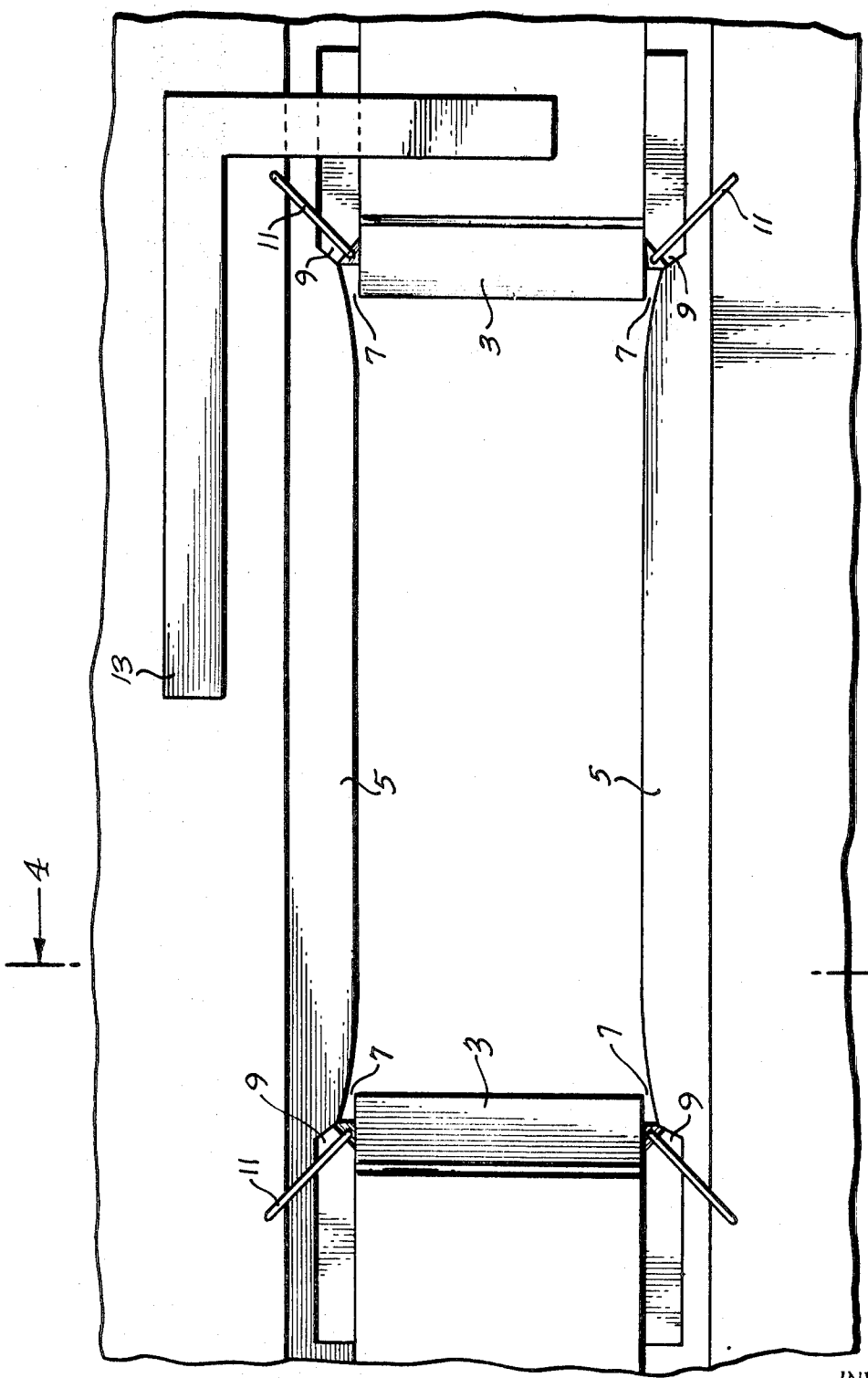


FIG. 3

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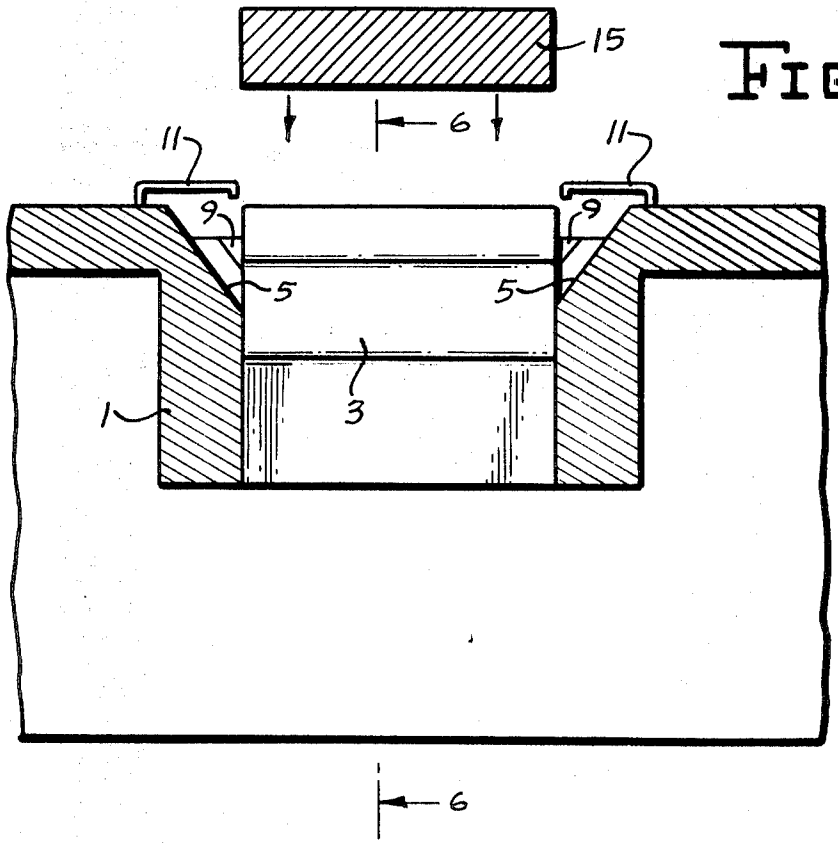


FIG. 4

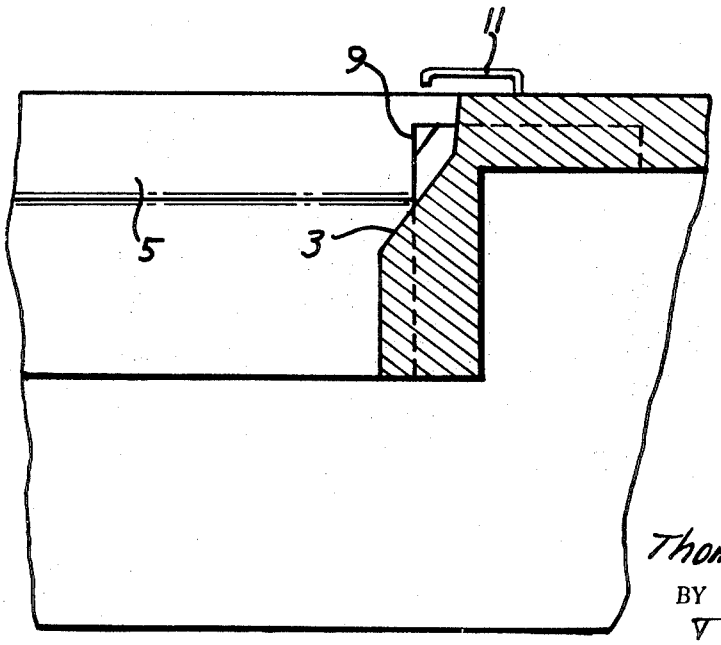


FIG. 6

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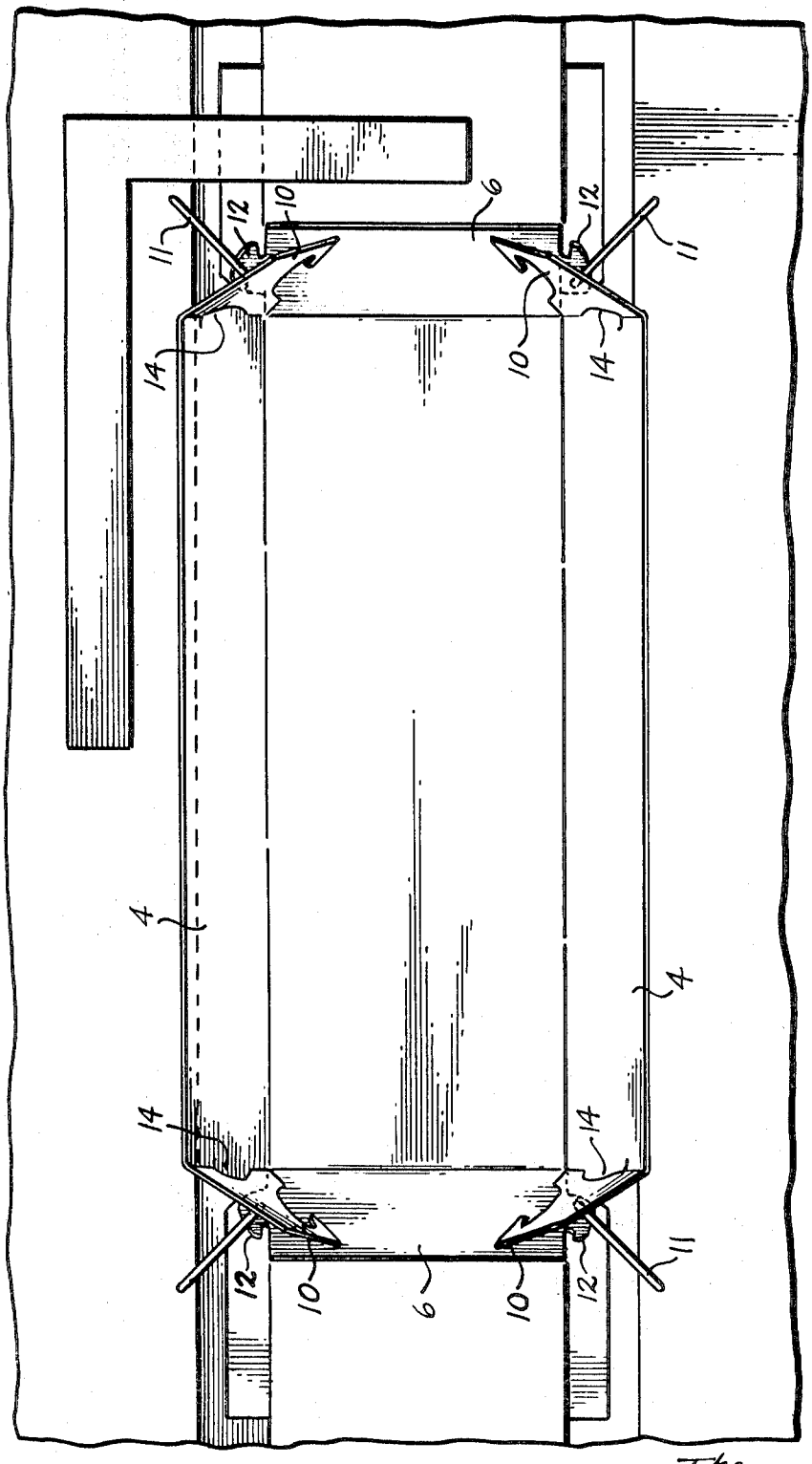


FIG. 5

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CARTON BLANK

This invention relates to a blank for a carton, preferably a cardboard carton, consisting of a flexible and breakable sheet which by means of fold and/or score lines is subdivided at least into wall panels and a bottom panel, the lines extending outwardly from the bottom panel defining corner panels between the adjacent wall panels, and to an apparatus for automatically setting up and locking the blank.

To this end, there is cut at each corner of the above-described blank a locking tab which extends from the side edge of one of the wall panels adjacent the corners into the corner panel, said locking tab being integral with said wall panel, and at the side edge of the other wall panel adjacent the corner a locking slit is cut which is adapted to receive the locking tab and extends into the wall panel and the corner panel. The apparatus according to the invention is essentially characterized in that there is provided adjacent at least one corner in an opening of essentially the same form and size as the bottom panel of the blank a first guide member serving to orient the blank in a position with the bottom panel substantially directly above said opening, and that there are provided adjacent each corner in said opening a second guide member which, when the blank is moved towards said opening, engages the corner panel and urges the latter towards the bottom panel, and a third guide member which, when the blank is moved towards said opening, engages the locking tab and directs it towards the locking slit.

Embodiments of the invention will be described more in detail in the following, reference being had to the accompanying drawings.

In the drawings:

FIG. 1 is a partial projection of a blank according to a first embodiment of the invention;

FIG. 2 is a partial projection of a blank according to a second embodiment of the invention;

FIG. 3 is a part top plan view of an apparatus according to the invention;

FIG. 4 is a section along line IV—IV in FIG. 3;

FIG. 5 is a partial section similar to that of FIG. 4 and illustrates a blank according to FIG. 1 which is partly inserted in the apparatus.

FIG. 6 is a section along line 6—6 in FIG. 4.

The blank portion shown in FIG. 1 which is intended for a carton, preferably a cardboard carton, a corner of the blank. Fold and/or score lines 2 subdivide the blank at least into two wall panels 4 and 6 and a bottom panel 8. The wall panels, the corner panels and the bottom panel can thus be bounded by score or fold lines or by perforations. At the corner between the wall panels 4 and 6 a corner panel 10 is formed. The outer edges of the corner panels are slightly offset from the outer edges of the wall panels 4 and 6. From the wall panel 6 a locking tab 12 of suitable shape extends into the corner panel 10. In the wall panel 4 and in the corner panel 10 a locking slit 14 of a shape corresponding to that of the locking tab 12 is cut. In this embodiment, the corner panel 10 is separated from the wall panel 6 along the side edge of the wall panel from the outer edge thereof down to the locking tab 12 and from this tab to the apex of the bottom panel 8.

The corner panel 10 can thus be folded along the side edge of the wall panel 4 along which a score line extends, except in the portion bounded by the locking slit 14. When the corner panel 10 is folded inwards about the side edge of the wall panel 4, the locking tab 12 and that portion of the wall panel 4 which extends into the corner panel 10 and is bounded by the locking slit 14 will remain aligned with the wall panels 6 and 4, respectively. By so folding the corner panel 10, there is formed for the locking tab 12 a relatively large opening which is bounded by the slit 14 and the wall panel 4. It will thus be very simple during the erection of the wall panels 4 and 6 towards the bottom panel 8 to introduce the locking tab 12 into the opening formed by the locking slit 14 and the folding of the corner panel 10, and the wall panels 4 and 6 will be locked in erected position by the tab 12. In this position, the corner panel 10 will be folded inwards in front of the wall panel 6, and the locking tab 12 will engage with the portion of the wall panel 4 and the corner panel 10 which lies above the locking slit 14.

The blank illustrated in FIG. 2 differs from that shown in FIG. 1 in that the corner panel is subdivided into two corner panel parts 10*a* and 10*b* by means of a score line extending from the corner apex of the bottom panel 8 to the apex of the corner panel. Moreover, the corner panel is not separated from the wall panel 6, but the side edge of this wall panel is formed by a score line extending from the bottom panel to the locking tab 12 in alignment with the score line separating the bottom panel 8 from the wall panel 4, but is offset above the locking tab 12 by approximately 2 mm. from the wall panel 6 towards the corner panel. When the blank is set up, the locking tab 12 and the locking slit 14 will function as in the blank according to FIG. 1, whereas the wall panel is folded inwards against the bottom panel 8 about the score line subdividing the wall panel. Because the upper side edge of the wall panel 6 is offset into the wall panel part 10*b*, the folded wall panel, after the blank has been set up, will be drawn against the wall panel 6 and thus engage this panel after the setting-up operation.

With the above-described embodiment of the cardboard blanks, it is possible to utilize an extremely simple apparatus for automatically setting up and locking the blanks. An embodiment of such an apparatus is illustrated schematically in FIGS. 3 and 4 and together with a partly erected blank in FIG. 5.

The setting-up and locking apparatus has an opening of a form and size substantially corresponding to the bottom panel 8 of the blank. The opening lies in the lower part of a die 1 the top of which has outwardly inclined wall portions 3 and 5 of which the wall portions 3 are located at the short sides and the wall portions 5 are located at the long sides. The wall portions 3 are located at a lower level than the wall portions 5. At each corner between the wall portions 3 and 5, a notch 7 is formed by the slightly arcuate shape of the wall portions 5 at each corner away from the wall portions 3. At each corner of the die 1 a guide member 9 is provided, preferably in the form of a shoulder. Above the guide shoulder 9 a further guide member 11 projects into the die 1 and is located in this embodiment above the die opening. The apparatus may also be provided with a further guide member 13 located at one corner and outside of the die opening 1. Above the die 1, there is provided a plungerlike member 15 of a form and size substantially corresponding to the bottom panel and thus to the opening previously mentioned and located at the bottom of the die 1. The plungerlike member 15 serves to advance a blank through the die 1.

FIG. 5 shows a blank of the type illustrated in FIG. 1 which is partly inserted in the die. Before the blank is moved to the position shown in FIG. 5, it is guided by the member 13 to a position directly above the die 1 and directly below the plungerlike member 15. After the blank has been inserted in this manner, the plunger 15 is lowered by means of some suitable per se known device. When the plunger 15 is thus lowered, the blank will be moved downwards into the die, and initially the blank assumes the shape shown in FIG. 5 in which the wall panels 4 engage the wall portions 5 and the corner panels 10 engage the guide members 11. As the wall portions 3 are located at a lower level than the wall portions 5, the wall panels 4 will be set up before the wall panels 6, the locking tabs 12 of which engage the shoulders 9. After further lowering of the plunger 15, the guide shoulders 9 will guide the locking tabs 12 towards the locking slits which are opened when the corner panels 10 are folded. During the continued lowering of the plunger 15, the wall panels 4 will thus be set up somewhat more, before the wall panels 6, whereby the locking tabs will be moved into the openings formed at the locking slits. After the plunger 15 has been lowered completely, a finished cardboard box with erected wall panels locked to each other will emerge at the bottom of the die 1. While the

blank is advanced through the die 1, the notches 7 serve to offer free passage to the portions of the wall panels bounded by the locking slits 14.

The automatic setting-up and locking of the blank according to the embodiment illustrated in FIG. 2 takes place in essentially the same way as the above described setting-up of the blank according to FIG. 1.

In addition to the advantage provided by the blank of this invention, which offers automatic setting-up and locking, a further and considerable advantage is obtained in that the blank can be so manufactured that no internal excess material need be removed, but only the material exceeding the configuration of the blank. In this way, it is possible to reduce not only the time required for making the blank, but also the production costs therefor since a minimum of material is required for the blank. Moreover, only one operation is necessary, viz the punching of the blank so that any gluing or other closing operations are eliminated. The walls of the finished cardboard carton are unbroken all around, in spite of the fact that the carton is locked with a tab system, the locking taking place at the corners, which offers the best possibilities of applying decorative or informative print.

The advantages of the apparatus for the automatic setting-up and locking operations are that the construction is extremely simple, and that the actual locking operation requires no movable parts such as fingers, springs or the like. In addition to the rapid and reliable setting-up and locking, the production costs of a cardboard carton made in accordance with the present invention are extremely low.

Although embodiments of this invention have been described and illustrated, it will be obvious that the invention is not limited thereto, and that many modifications can be effected within the scope of the inventive idea as defined by the appended claims. For instance, the corner panel 10 in the embodiment according to FIG. 1 need not have the illustrated form, but can be cut to expose the locking tab 12, or at least the outer or upper portion thereof. For production technical reasons it may also be advisable to make the hook-shaped recess of the locking tab 12 broader so that the widening extends into the wall panel 6.

What I claim is:

1. A blank for a carton, preferably a cardboard carton, consisting of a flexible and breakable sheet which by means of fold and/or score lines is subdivided at least into wall panels and a bottom panel, the lines extending outwardly from the bottom panel defining corner panels between the adjacent wall panels, characterized in that there is at each corner a locking tab which extends from the side edge of one of the wall panels adjacent the corner into the corner panel, said locking tab being integral with said wall panel, and in that there is cut at the side edge of the other wall panel adjacent the corner a locking slit which is adapted to receive the locking tab and extending into the other wall panel and the corner panel at an angle relative to the side edge of said other wall panel.

2. A blank as claimed in claim 1, characterized in that the corner panels are subdivided into two part panels by means of a score line extending from the corner apex of the bottom panel to the apex of the corner panel.

3. A blank as claimed in claim 1, characterized in that the corner panel is separated from the adjacent wall panel along that edge of the corner panel which faces the locking tab.

4. A blank for a carton, preferably a cardboard carton, consisting of a flexible and breakable sheet which by means of fold and/or score lines is subdivided at least into wall panels and a bottom panel, the lines extending outwardly from the bottom panel defining corner panels between the adjacent wall panels, characterized in that there is at each corner a locking tab which extends from the side edge of one of the wall panels adjacent the corner into the corner panel, said locking tab being integral with said wall panel, and in that there is cut at the side edge of the other wall panel adjacent the corner a locking slit which is adapted to receive the locking tab and extending into the wall panel and the corner panel, characterized in that one of the corner panel parts is bounded from the upper or outer part of the adjacent wall panel by means of a score line offset from the wall panel, and from the lower or inner part of the wall panel by a score line extending in alignment with the score line bounding the bottom panel.

5. A blank as claimed in claim 4, characterized in that the score line is offset by approximately 2 mm. from the adjacent wall panel into the corner panel part.

6. A blank as claimed in claim 4, characterized in that the locking tab extends between the offset score line and the aligned line into the corner panel part, the aligned line extending over the locking tab.