

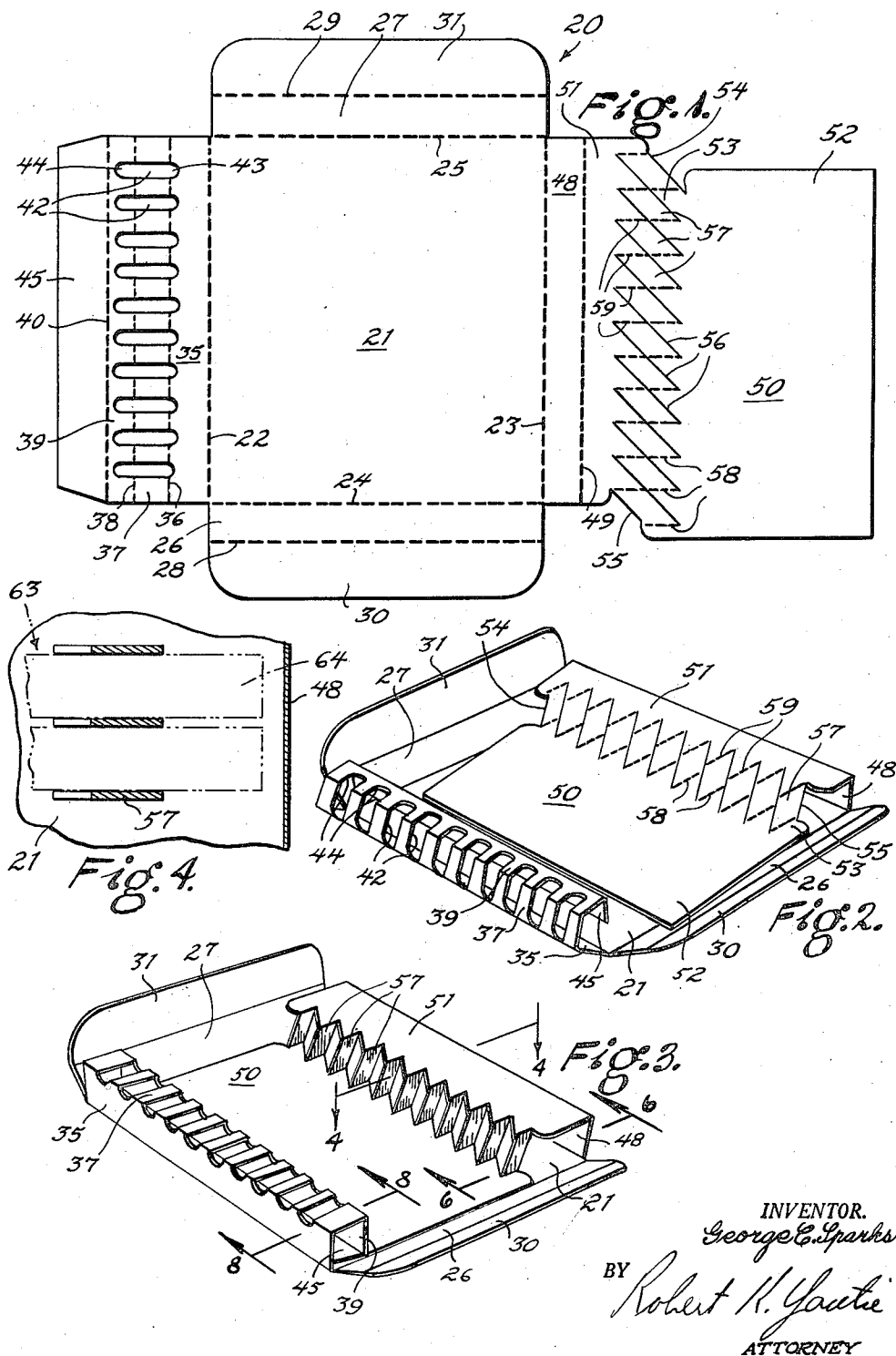
Oct. 14, 1958

G. C. SPARKS
PACKAGING DEVICES

2,856,067

Filed Feb. 27, 1956

4 Sheets-Sheet 1



Oct. 14, 1958

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4 Sheets-Sheet 2

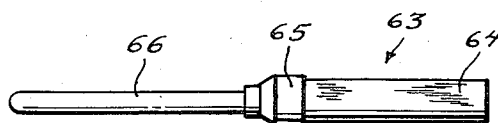
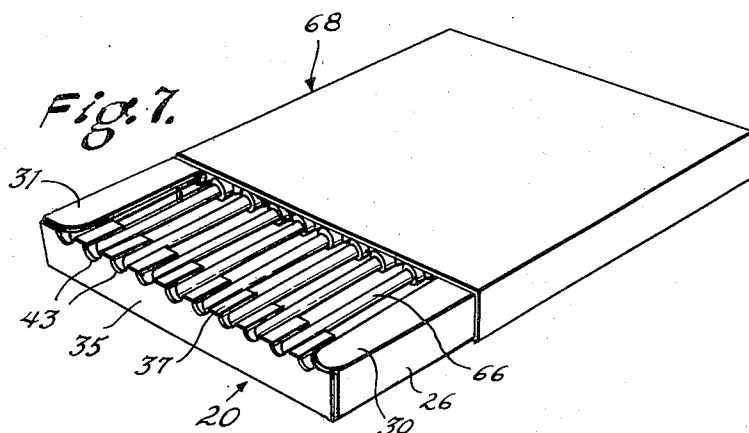


Fig. 5.

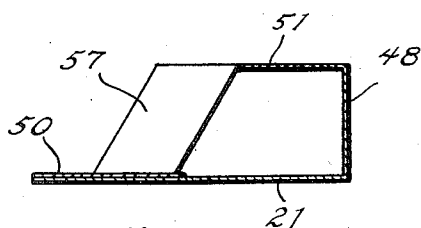


Fig. 6.

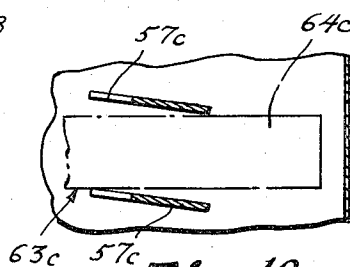


Fig. 19.

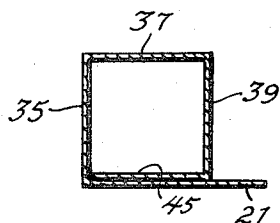


Fig. 8.



Fig. 9.

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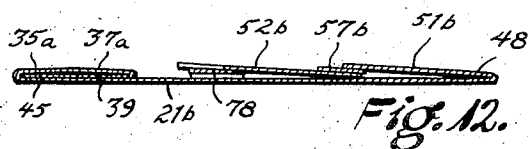
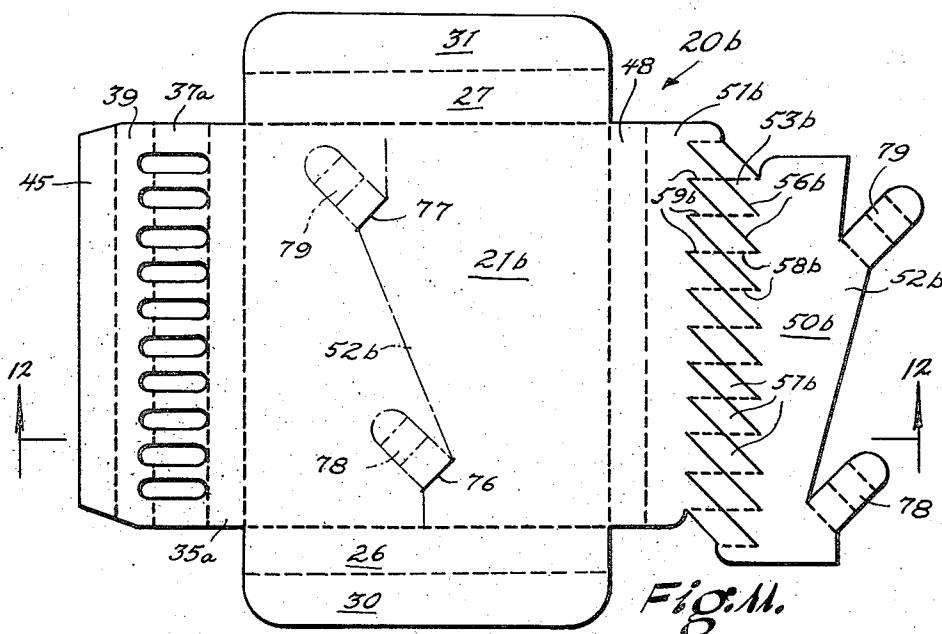
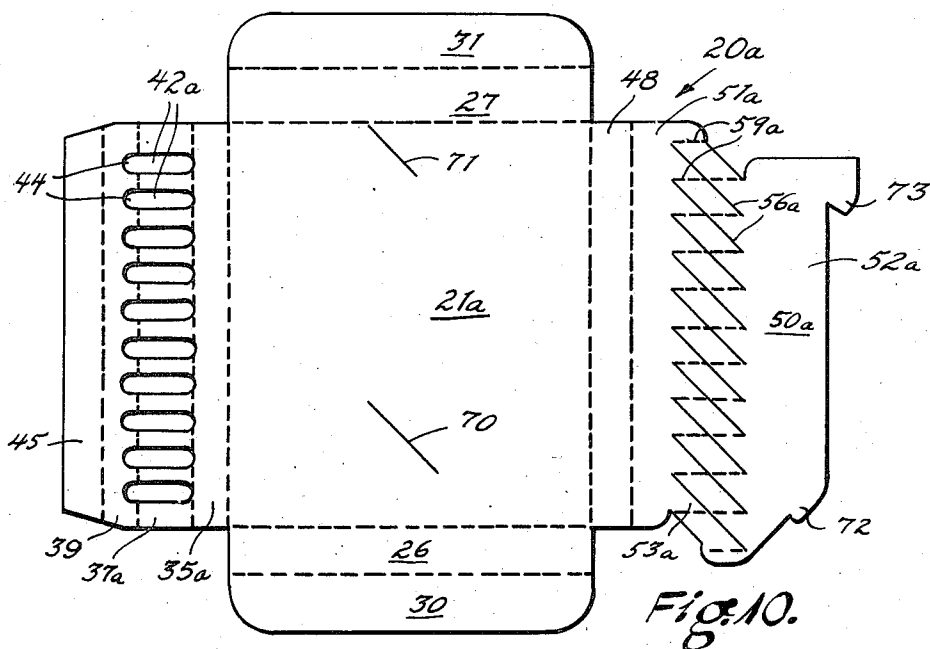
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4 Sheets-Sheet 3



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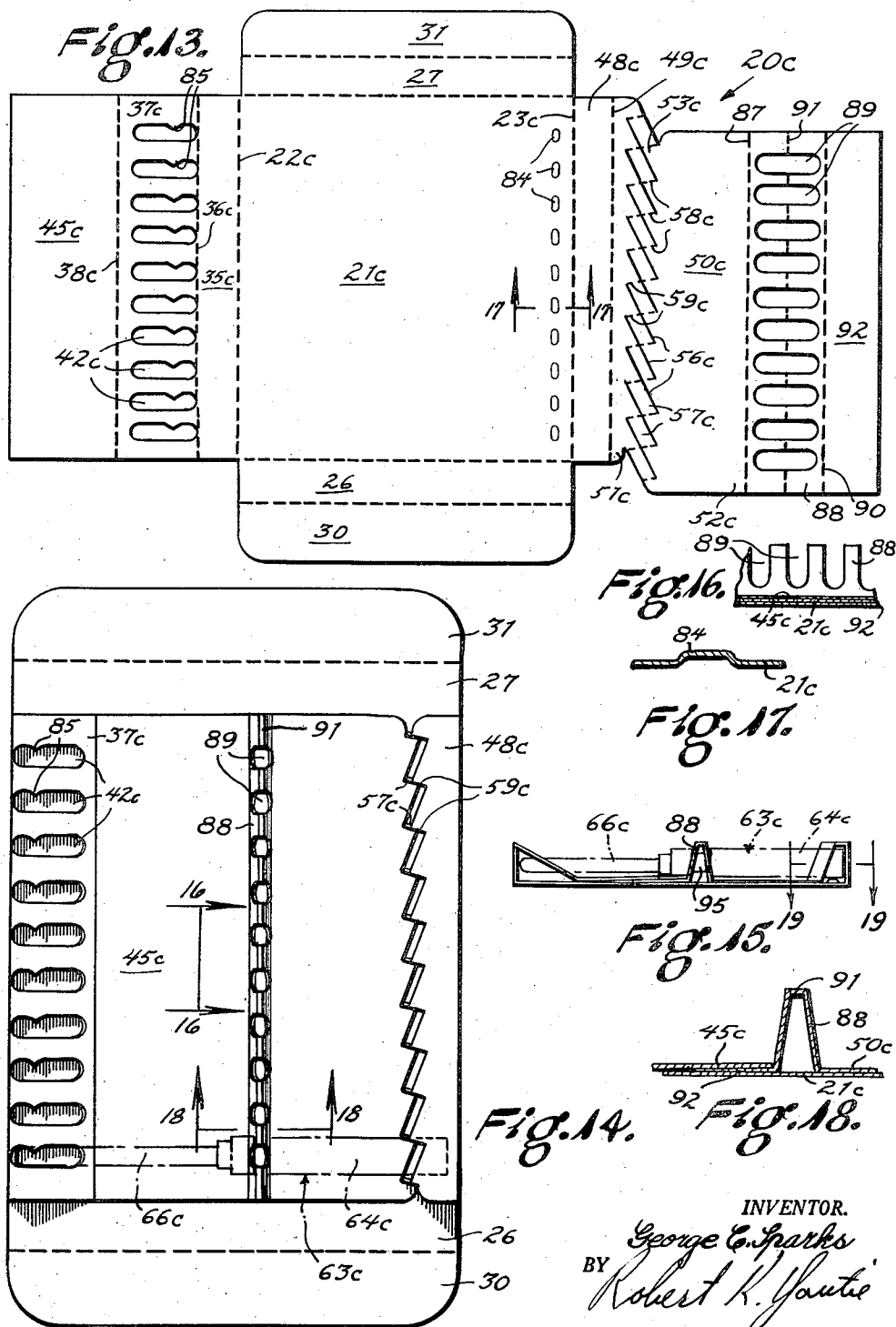
Oct. 14, 1958

G. C. SPARKS
PACKAGING DEVICES

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4 Sheets-Sheet 4



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2,856,067

PACKAGING DEVICES

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Application February 27, 1956, Serial No. 568,005

7 Claims. (Cl. 206—43)

This invention relates generally to packaging devices, and is particularly directed to a new and improved carton construction adapted to safely contain relatively delicate objects. The invention also embraces a novel blank for use in making the improved carton.

The particular embodiments of the present invention, which are illustrated in the drawings and which will be described hereinafter in greater detail, comprise generally a bottom wall, front and rear walls on the bottom wall, a ledge extending forwardly from the rear wall space above the bottom wall, a plurality of spaced separators depending from the forward region of the ledge to the bottom wall, and an apertured panel extending rearwards from the front wall. A plurality of delicate objects are adapted to be arranged side by side each having one end received in one of the panel openings and its other end received between an adjacent pair of the separators.

While the instant device has been primarily developed and employed for packaging hypodermic needles, and will be described hereinafter with particular reference thereto, it is understood that the device is capable of numerous applications in the packaging of a wide variety of other articles.

It is one object of the present invention to provide a carton construction of the type described which serves to effectively protect relatively delicate articles from damage during shipment, storage and use, the carton occupying a minimum of space consistent with the size and shape of contained articles, and enabling the articles to be quickly, easily and safely exposed to view and removed in any desired quantity.

It is another object of the present invention to provide a packaging device of the type described which is adapted to be stored, say prior to use, in either a set up condition ready to be filled, or in a flat, knocked down condition for maximum economy of space, from which latter condition it may be simply and readily erected to receive the intended contents. The invention also contemplates the provision of a simple and inexpensive, one piece blank for use in making the subject carton.

It is a further object of the present invention to provide a carton having the advantageous characteristics mentioned in the foregoing paragraphs, which is staunch and durable in construction, highly attractive in appearance, and which can be manufactured and sold at a reasonable cost.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

2

In the drawings:

Figure 1 is a plan view showing a blank adapted for use in constructing the carton of the present invention;

Figure 2 is a perspective view showing the blank of

5 Figure 1 in an intermediate stage of setting up;

Figure 3 is a perspective view showing the blank of Figures 1 and 2 in a substantially completely set up condition;

Figure 4 is a partial sectional view taken substantially 10 along the line 4—4 of Figure 3;

Figure 5 is a side view showing a hypodermic needle, as representative of delicate articles adapted to be packaged in the instant carton;

Figure 6 is a partial sectional view taken substantially 15 along the line 6—6 of Figure 3;

Figure 7 is a perspective view showing a completed carton of the present invention, including a plurality of hypodermic needles contained in the carton and a cover partially removed from the carton.

Figure 8 is a partial sectional view taken substantially 20 along the line 8—8 of Figure 3;

Figure 9 is a sectional view showing the elements of Figure 8, but in a collapsed or knocked-down condition;

Figure 10 is a slightly modified form of blank adapted 25 to be used in making a carton according to the present invention;

Figure 11 is a plan view showing another slightly modified form of blank adapted to be used in making a carton according to the present invention;

Figure 12 is a sectional view taken substantially along 30 the line 12—12 of Figure 11; but showing the blank of the latter figure in a folded or collapsed condition;

Figure 13 is a plan view showing a further embodiment of a blank of the present invention;

Figure 14 is a top plan view showing a substantially 35 completely erected carton formed from the blank of Figure 13, and illustrating in dot-and-dash outline an article contained in the carton;

Figure 15 is a side elevational view showing the carton 40 and article of Figure 14;

Figure 16 is a partial, sectional view taken substantially along the line 16—16 of Figure 14;

Figure 17 is a partial, sectional view taken substantially along the line 17—17 of Figure 13;

Figure 18 is a partial, sectional view taken substantially 45 along the line 18—18 of Figure 14; and

Figure 19 is a partial, sectional view taken substantially along the line 19—19 of Figure 15.

Referring now more particularly to the drawings, and specifically to Figure 1 thereof, the embodiment of the invention illustrated therein constitutes a blank, generally designated 20, preferably fabricated of one piece of cardboard or other suitably stiff sheet material. The blank 20 50 includes a generally rectangular main panel 21 bounded along its front and rear edges, respectively, by parallel fold lines, creases or scores 22 and 23, and along its opposite side edges by parallel fold lines or scores 24 and 25, which extend between the front and rear edge fold lines. Extending laterally outwards from the side edge fold lines 24 and 25, respectively, and longitudinally coextensive therewith, are generally rectangular lateral extensions or side panels 26 and 27. That is, that the lateral extensions 26 and 27 are hingedly connected to opposite side edges of the main panel 21 by the fold lines 24 and 25, respectively. Hingedly connected to the outer edges of the side panels or extensions 26 and 27, as by fold lines 28 and 29, are generally rectangular side flaps 30 and 31.

A generally rectangular forward extension or section 35 extends along the front edge of the main panel 21, being coextensive therewith, and is hingedly connected 70 to the main panel by the front edge fold line 22. The

forward edge of the forward extension 35 is defined by a fold line or crease 36 which is parallel to the fold line 22 and serves to hingedly connect a generally rectangular forward panel 37 to the outer boundary or edge of the forward extension. The forward panel 37 is laterally coextensive with the forward extension 35, so that the side edges of the forward extension and forward panel are in alignment with each other and with the side creases 24 and 25 of the main panel. A laterally extending fold line 38 defines the forward boundary of the forward panel 37 and serves to hingedly connect an additional, generally rectangular panel 39 to the forward panel 37. The additional panel 39 has its outer boundary defined by a fold line 40 parallel to the fold line 38, and is laterally coextensive with the forward panel 37, so that the side edges of the former panel are in alignment with the side edges of the latter panel.

It will be noted that the forward panel 37 is formed with a plurality of laterally spaced through apertures or through openings 42 of generally elongate configuration in the forward and rearward direction. More particularly, each of the apertures 42 has its opposite end portions 43 and 44 extending through and beyond the fold lines 36 and 38 into the extension 35 and panel 39 but terminate short of the fold lines 22 and 40. Viewed otherwise, the aperture end portions 43 may be considered as a plurality of laterally spaced cut outs formed in the extension panel 35 and each opening through the fold line 36 into a respective one of the forward panel openings 42. Similarly, the aperture end portions 44 may be considered as a plurality of laterally spaced cut outs each opening through the fold line 38 and into its respective forward panel aperture 42.

Hingedly connected on the forward edge of the additional panel 39, by the fold line 40, is a generally trapezoidal tab or flap 45.

Coextensive with and hingedly connected to the rear edge of the main panel 21 by the fold line or crease 23 is a generally rectangular rearward extension or section 48, which has its side edges in alignment, respectively, with the side edge creases 24 and 25 of the main panel and has its outer boundary defined by a fold line or crease 49 extending parallel to the crease 23. Extending rearwards from the rearward section 48 and hingedly connected to the latter by the fold line 49, is a rearward panel 50. The rearward panel includes an inner portion 51 of somewhat rectangular configuration, which is laterally coextensive with the contiguous rearward extension or section 48, and a somewhat rectangular outer portion which is offset laterally from the inner portion and of the same lateral dimension as the inner portion. The rearward panel 50 also includes an intermediate portion 53 extending between and connecting the inner and outer portions 51 and 52.

The intermediate portion 53 of the rearward panel 50 has its opposite side edges 54 and 55 disposed in parallelism with each other and extending obliquely with respect to the parallel fold lines 23 and 49. Further, the intermediate rearward panel portion 53 is provided with a plurality of laterally spaced through cuts or slits 56 which extend parallel to each other and to the side edges 54 and 55, so as to be oblique to the fold lines 23 and 49. It will now be appreciated that the cuts or slits 56 formed in the intermediate rearward panel portion 53 serve to define in the latter a plurality of parallel strips 57 extending oblique to the fold line 49 and rearward section 48. Stated otherwise, the panel portion 57 in the space between each adjacent pair of cuts 56 defines a strip 57 extending oblique to the fold line 49 and section 48. It will be noted that the strips 57 are one greater in number than the forward panel apertures 42; and that the strip defining cuts 56 are arranged so that the space between the forward ends of each adjacent pair of cuts is in rearward alignment with a respective aperture.

A group of laterally spaced, parallel fold lines 58 are

formed in the intermediate rearward panel portion 53 each extending from the outer end of a respective cut 56 inwards toward and terminating at a point of intersection with the next adjacent cut. That is, all of the fold lines 58 terminate at their inner ends at the next adjacent cut except one endmost fold line 58 which terminates at one side edge of the intermediate rearward panel portion (the lowermost fold line 58 in Figure 1). Another group of laterally spaced parallel fold lines 59 are formed in the intermediate rearward panel portion 53 each extending generally outwards from the inner end of a respective cut 56 toward and terminating at a point of intersection with the next adjacent cut, all except one endmost fold line 59 (the uppermost in Figure 1), which terminates at a side edge of the intermediate rearward panel portion. Further, the fold lines 58 and 59 are parallel to each other. In the illustrated embodiment of Figure 1 the fold lines 58 and 59 are substantially normal or perpendicular to the fold line or crease 49; however, this relationship may advantageously be modified, as will appear hereinafter in greater detail.

In setting up or erecting a carton from the blank 20 of Figure 1, the flap 45 is swung rearwards about the fold line 40, the panel 39 and flap 45 are rearwardly swung together about the fold line 38, the flap 45, panel 39 and panel 37 are rearwardly swung together about the fold line 36, and the flap 45, panels 39 and 37, and forward extension 35 are rearwardly swung together about the fold line 22. This condition is illustrated in Figure 2. Also as shown in Figure 2, the rearward panel 50 has been swung forwards about the fold line 49 and the rearward panel 50 and rearward extension 48 have been swung forwards together about the fold line 23. The side flaps 30 and 31 may then be swung inwards about their respective fold lines 28 and 29, and the lateral extensions 26 and 27 swung inwards together with their contiguous side flaps about their respective fold lines 24 and 25.

The forward flap 45 may then be secured in facing engagement with the upper surface of the main panel 21 so that the extension 35 defines an upstanding forward wall on the main panel, and the forward panel extends rearwards from the upper edge of the forward wall in parallel spaced relation over the main panel, being supported along its inner edge by the additional panel 39. This construction is best seen in Figure 8, wherein the flap 45 extends forwards from the lower edge of the panel 39 and is secured by any suitable means to the main panel 21 directly below the panel 37. Of course, the flap 45 may extend rearwards from the lower edge of the panel 39, and be there secured to the main panel 21, so as to provide the desired box-like forward end structure. Figure 9 illustrates the box-like structure of Figure 8 in collapsed or folded condition.

The intermediate portion 53 of the rearward panel 50 may then be bent along the fold lines 58 and 59 to swing the outer portion 52 of the rearward panel into a plane parallel to but spaced from the plane of the inner rearward panel portion 51. That is, the strips 57 defined between the cuts 56, are each connected at its opposite ends by a pair of parallel folds 58 and 59 to the outer and inner portions 52 and 51, respectively, of the rearward panel 50, and serve to connect such portions for relative movement between a coplanar and a spaced, parallel plane relation. Further, the strip dimensions are such that the outer portion 52 of the rearward panel swings into lateral alignment with the inner rearward panel portion 51 and at a perpendicular distance from the plane of the latter equal to the dimension between the fold lines 23 and 49, when the strips are substantially normal to the inner and outer rearward panel portions.

Hence, with the rearward extension or section 48 swung to a generally normal, upstanding relation with respect to the main panel 21, the inner rearward panel portion 51 defines a ledge extending forwards from the

upper edge of the section 48 in parallel spaced relation over the main panel, and the outer rearward panel portion 52 rests in facing engagement on the upper surface of the main panel in laterally coextensive relation with respect thereto. Securement by any suitable means of the rearward panel portion 52 to the main panel serves to maintain the strips 57 in their laterally spaced relation of Figure 3 disposed generally normal to and extending between the ledge 51 and main panel 21, while the rearward extension or section 48 defines an upstanding rear wall on the rear edge of the main panel.

In this condition it will be appreciated that the main panel 21 defines a bottom wall for the erected carton, and that each of the forward panel apertures 42 is disposed opposite to and opens rearwards through its associated cut out 44 toward a respective space between an adjacent pair of the strips 57. That is, each of the inter-strip spaces and a respective one of the openings 42 are located in forward and rearward alignment with respect to each other.

By way of example, a delicate object of elongate configuration, generally designated 63, is shown in Figure 5 as a hypodermic needle. As illustrated, the hypodermic needle 63 includes at one end a cylindrical medicine holding chamber 64 which is usually fabricated of glass or other transparent fragile material. A connector or coupling 65 is secured on the inner end of the glass cylinder 64 for rigidly connecting a needle proper 66 to the cylinder. The needle 66 may conventionally include a removable protective sheath of rubber or other suitable material.

In packing or filling the carton of Figure 3 with a plurality of delicate objects 63, the distal end of the cylinder 64 of each object is inserted rearwards beneath the ledge 51 through the space between an adjacent pair of strips 57. This relationship is shown in Figure 4, wherein the cylinders 64 are illustrated in dot-and-dash outline. Remote from each cylinder 64, the forward or distal end portion of each needle proper 66 is received in a respective forward panel opening 42, as seen in Figure 7. The strips 57 thus serve to separate and restrain lateral movement of the cylinders 64, while the panel openings 42 prevent lateral movement of each needle proper 66. Rearward and forward longitudinal shifting of the article 63 is effectively limited by the rearward and forward carton walls 48 and 35. In the case of rearward article movement, the cylinder 64 will, of course, abut against the rear wall 48. Similarly, upon forward shifting of the articles 63, the distal ends of the needle 66 will abut against the front wall 35. That is, the cut outs 44 formed in the inner forward wall or panel 39 serve to support the needles 66, and are of greater depth than the cut outs 43, so that the needles may not shift forwards through the latter cut outs without being at least slightly elevated. Such elevation is prevented by the generally open ended tubular sheath or cover 68 extending laterally about the carton 20.

As best seen in Figure 7, the cover 68 is of tubular, open ended generally rectangular cross-sectional configuration to slidably and conformably receive the carton 20 and prevent removal of the articles 63 from the carton. However, upon partial withdrawal of the carton 20 from the cover 68, the condition seen in Figure 7, the article needle 66 may be slightly elevated and withdrawn forwards and upwards from the carton.

In figure 10 is shown a slightly modified form of blank 20a, which is similar to the first described blank 20 and is adapted to be stored in a partially erected, but collapsed condition. The blank 20a includes a generally rectangular main panel 21a similar to the panel 21, but provided with a pair of parallel spaced cuts or slits 70 and 71 which extend diagonally of the panel and generally parallel to the cuts 56a of the rearward panel 50a. Lateral extensions 26 and 27, and side flaps 30 and 31 are provided as in the blank 20.

Extending forwards from the front end of the panel 21a is a generally rectangular forward extension or section 35a, which is substantially the same as the forward extension 35 of Figure 1 but which is not provided with cut outs corresponding to those at 43 in Figure 1. A forward panel 37a is hingedly connected to and extends forward from the extension 35a, similar to the forward panel 37, and is formed with a plurality of laterally spaced apertures 42a corresponding to the apertures 42, but terminating at the hinged connection between the extension 35a and panel 37a.

An additional panel 39 having cut outs 44 is hingedly connected to the forward edge of the panel 37a, and a forward flap 45 is hingedly connected to the panel 39, all as in the form of Figure 1.

Hingedly connected to the rear edge of the main panel 21a is a rearwardly extending generally rectangular section 48, the same as in Figure 1. Hingedly connected to and extending rearwards from the rearward section 48 is a rearward panel 50a which includes an inner portion 51a laterally coextensive with the section 48, an outer portion 52a laterally offset from the inner portion, and an intermediate portion 53a extending between and connecting the inner and outer rearward panel portions. The inner and intermediate rearward panel portions 51a and 53a are substantially the same as the inner and intermediate panel portions 51 and 53 of Figure 1, however the outer rearward panel portion 52a differs in being provided with a pair of laterally spaced tongues or tabs 72 and 73 projecting laterally in the offset direction of the outer rearward panel portion.

The procedure for erecting a carton from the blank 20a is substantially the same as that described hereinbefore in connection with the blank 20 except that the tongues 72 and 73 are inserted through the cuts 70 and 71 instead of otherwise securing the outer rearward panel portion 52a to the main panel 21a. The inherent resilience in the rearward panel 50a tending to return the inner and outer portions thereof to their coplanar relation will retain the tongues 72 and 73 in their respective slots 70 and 71.

It will now be understood that the blank 20a may be stored in a partially set up, but substantially collapsed condition, wherein the forward box-like structure of the section 35a, panels 37a and 39, and flap 45 may be collapsed to a condition such as that shown in Figure 9 and the rearward panel 50a may rest on the main panel 21a either with or without the intermediate rear panel portion 53a folded along the lines 56a and 59a. This, of course, makes for economy of space in storage and extremely rapid set up for filling.

The absence of cut outs in the extension 35a, which defines the forward carton wall, may be desirable under certain circumstances, especially where the article being packaged is of such dimensions that even a small forward wall cut out would allow forward shifting movement of the article.

Another slightly modified form of blank 20b is illustrated in Figure 11, which also permits of being stored in a partially set up, but completely collapsed condition. The blank 20b includes a generally rectangular main panel 21b substantially identical to the main panel 21, but provided with a pair of parallel through cuts or slots 76 and 77 disposed oblique to the configuration of the main panel and generally normal to the cuts 56b of the rearward panel 50b, as will appear presently in greater detail. Extending forwards from the front edge of the main panel 21b are a forward section 35a, a forward panel 37a, an additional panel 39, and a flap 45, all substantially identical to that of Figure 10. Side panels 26 and 27, and side flaps 30 and 31 are provided on the side edges of the main panel 21b substantially the same as in the forms of Figures 1 and 10 described hereinbefore.

A rearward section 48 extends from the rear edge of

the main panel 21b, as in the forms of Figures 1 and 10, and a rearward panel 50b is hingedly connected to the rear or outer boundary of the rearward section. The rearward panel 50b has its inner portion 51b and intermediate portion 53b substantially identical to the inner and intermediate portions 51 and 53 of the rearward panel 50 in Figure 1, but the outer portion 52b of the rearward panel 50b is provided on its outer edge with a pair of laterally spaced generally parallel tabs 78 and 79 which extend generally normal to the cuts 56b.

The blank 20b of Figure 11 is erected or set up in substantially the same manner as the blank 20 of Figure 1, except that the tabs 78 and 79 are inserted through the slots 76 and 77, respectively, instead of otherwise securing the rearward panel 50b to the main panel 21b. The outer rearward panel portion 52b is shown in dot-and-dash outline in its set up condition with the tabs 78 and 79 inserted through the slots 76 and 77. It will be noted that the angular disposition of the slots 76 and 77, and the tabs 78 and 79 facilitates erection in that endwise insertion of the tabs through the slots may be effected simultaneously, with folding of the rearward panel 50b along its fold lines 56b and 59b. Once inserted in the slots 76 and 77, the tabs 78 and 79 may be folded under the main panel 21b to retain the tabs in the slots.

For economy of space in storage and convenience in filling or packing, the blank 20b of Figure 11 may be stored in its partially erected, substantially flat condition of Figure 12, wherein the extension 35a, panels 37a and 39, and tab 45 are folded flat on the main panel 21b, and the rearward panel 50b, with its intermediate portion folded along the lines 56b and 59b, is also superposed substantially flat on the main panel.

A further embodiment of the invention is illustrated in Figures 13-19, wherein a blank 20c is adapted to be formed into a carton of the present invention. The blank 20c includes a generally rectangular main panel 21c similar to the main panel 21 of the first described form, but provided along its rearward boundary or edge with a plurality of laterally spaced upset portions or pads 84. More particularly, the pads are formed of the main panel material, as best seen in Figure 17, and are arranged in a series or line adjacent to and spaced inwards from the rearward edge of the main panel. A pair of side panels 26 and 27 extend laterally from opposite side boundaries or edges of the main panel 21c, each having a side flap hingedly connected thereto, as at 30 and 31, as in the form of Figure 1.

A generally rectangular section 35c is laterally coextensive with and hingedly connected by a fold line 22c to the forward boundary or edge of the main panel 21c; and, a forward panel 37c is laterally coextensive with and hingedly connected to the forward edge or crease 36c of the extension 35c, so that the side edges of the forward extension and forward panel are in substantial alignment with each other and with the side boundaries of the main panel 21c. Formed in the forward panel 37c are a plurality of laterally spaced apertures or openings 42c of forward and rearward elongate configuration. More specifically, the openings 42c are arranged in side by side relation each in substantial forward and rearward alignment with a respective one of the pads 84, terminating at its inner end substantially coincident with the hinged connection 36c between the forward panel 37c and section 35c, and having its outer end terminating short of the outer bounding fold line 38c of the forward panel. Further, the forward panel 37c is shaped to define a plurality of points or protrusions 85 each projecting laterally into a respective one of the cut outs 42c intermediate the ends thereof. Hingedly connected along the outer or forward boundary 38c of the forward panel 37c is a flap 45c.

A generally rectangular section 48c is laterally coextensive with and hingedly connected by the fold line 23c to the rearward boundary of the main panel 21c, cor-

responding to the rearward extension 48 of Figure 1. A rearward panel 50c is hingedly connected, as by a fold line or crease 49c to the rearward boundary or edge of the section 48c, and includes an inner portion 51c contiguous to the latter section, and outer portion 52c offset laterally from the inner portion, and an intermediate portion 53c connecting the inner and outer rearward panel portions. The intermediate rearward panel portion 53c is formed with a plurality of laterally spaced through cuts or slits 56c disposed in parallelism with each other and oblique to the forward and rearward boundaries 22c and 23c of the main panel 21c. Further, the side edges of the intermediate rearward panel portion 53c are parallel to the cuts 56c. Also formed in the intermediate rearward panel portion 53c are a group of parallel fold lines 58c each extending generally inwards from the outer end of a respective cut 56c and terminating at a point of intersection with the next adjacent cut; and, an additional group of parallel fold lines 59c are formed in the intermediate rearward panel portion each extending generally outwards from the inner end of a respective cut 56c and terminating at a point of intersection with the next adjacent cut.

In Figure 13 it will be noted that the fold lines 58c and 59c are substantially parallel to each other, and extend oblique to the forward and rearward boundaries of the main panel 21c, at an angle slightly less than perpendicular to such boundaries. The intermediate rearward panel portion 53c may be considered as composed of a plurality of parallel strips 57c extending oblique to the forward and rearward boundaries of the main panel 21c and each defined by the material in the space between an adjacent pair of cuts 56c and a pair of fold lines 58c and 59c extending between the respective adjacent pair of cuts. Further, the endmost fold lines of each group 58c and 59c intersect with the side edges of the intermediate rearward panel portion 53c, which edges and fold lines combined with the endmost cuts 56c to define the endmost strips 57c. From Figure 13 it will be observed that the space between the forward ends of each adjacent pair of strips 57c is in substantial forward and rearward alignment with the adjacent pad 84 and a respective forward panel opening 42c, for purposes appearing presently in greater detail.

Hingedly connected to the rearward boundary or edge of the rearward panel 50c, as by a fold line 87 parallel to the fold line 49c, is a generally rectangular auxiliary panel 88. More particularly, the auxiliary panel 88 is laterally coextensive with the outer portion 52c of the rearward panel 50c, and provided with a plurality of laterally spaced forwardly and rearwardly elongate through apertures or holes 89. It will be noted that each of the auxiliary panel apertures 89 is in forward and rearward alignment with a respective space between the rearward ends of adjacent pairs of strips 57c. The holes 89 are equal in number to the pads 84 and openings 42c, each hole being laterally offset from an aligned pair of pads and openings a distance equal to the offset of the outer portion of the rearward panel. The outer boundary of the auxiliary panel 88 is defined by a laterally extending fold line or crease 90, while a fold line or crease 91 is formed in the auxiliary panel extending laterally there along parallel to and substantially equi-distant between the fold lines 87 and 90 so as to intersect each of the holes 89 at approximately its medial region. Hingedly connected to the outer boundary or edge of the auxiliary panel 88, by the fold line 90, is a generally rectangular section or flap 92.

In setting up or erection of the blank 20c, the extension or section 48c may be first swung upwards about the rear edge fold 23c of the main panel 21c, after which the rearward panel 50c may be folded forwards about the hinged connection 49c of the rearward panel and section 48c. The rearward panel 50c may then be folded along the lines 58c and 59c to swing the outer

rearward panel portion 52c into a plane parallel to and spaced from the plane of the inner rearward panel portion 51c. That is, the outer rearward panel portion 52 is swung into lateral alignment with the inner rearward panel portion 51c and into facing engagement with the upper side of the main panel 21c. In this condition, the outer rearward panel portion 52c may be secured to the main panel 21c by any suitable means, and the strips 57c will be disposed in laterally spaced relation extending between the inner and outer rearward panel portions. As the fold lines 58c and 59c are disposed oblique to the forward and rearward boundaries 22c and 23c of the main panel, the strips 57c will, in horizontal section, extend oblique to the forward and rearward main panel boundaries.

The auxiliary panel 88 may then be folded upwards along the connection 87, and downwards along the intermediate fold line 91, with the flap 92 swung about the fold line 90 to extend forwards in facing engagement with the upper surface of the main panel. The auxiliary panel 88 will thus define a laterally extending ridge, with the fold 91 the crest of the ridge, and the holes or apertures 89 opening upwards to define a plurality of laterally spaced notches in the ridge.

The forward extension or section 35c may then be swung upwards about the fold line 22c, and the forward panel 37c swung rearwards about the fold line 36c to a rearwardly declining position, with the flap 45c swung about the fold line 38c to a position superposed on the upper surface of the main panel 21c and the flap 92c, see Figure 18, in which condition the flap 45c may be secured by any suitable means to the main panel.

It will now be apparent that the main panel 21c defines a carton bottom wall, while the forward and rearward extensions or sections 35c and 48c define upstanding front and rear walls on the front and rear ends of the bottom wall. Further, the inner rearward panel portion 51c provides a ledge (see Figure 15) extending forwards from the upper edge of the rear wall 48c over the pads 84, and the strips 57c depend in parallelism with each other from the forward region of the ledge to the bottom wall 21c with each pad 84 adjacent to the space between a respective adjacent pair of strips. Also, the apertures 42c in the rearwardly declining forward panel 37c are each located opposite to and facing toward a respective inter-strip space, its adjacent pad 84, and a respective one of the notches 89 in the lateral ridge 88. As the flap 45c is secured to the bottom wall 21c, it will be apparent that the section 35c will provide a firm upstanding front wall on the bottom wall, and that the forward panel 37c will be firmly held in its rearward declining relation. Of course, the side extensions and flaps 26, 27, 30 and 31 may be folded upwards and inwards as in the previously described forms of the invention.

The instant embodiment is particularly well-adapted for a type of hypodermic needle 63c having a reduced portion or neck 95 formed in its cylinder 64c, so that the neck is received in a notch 89 of the ridge 88 to prevent forward and rearward shifting movement of the article. Further, the distal end portion of each hypodermic needle cylinder 64c is received beneath the ledge 51c extending there below between an adjacent pair of strips 57c and resting on the adjacent pad 84. As best seen in Figure 19, the strips 57c serve to separate and prevent contact between adjacent articles 63c. Further, the strips 57c, by their oblique disposition and inherent resiliency, serve to snugly, but not tightly, retain the article cylinder 64c in the illustrated position. That is, one strip 57c of each adjacent pair resiliently engages along its rearward edge with the intermediate cylinder 64c, and the other strip of the particular pair engages along its forward edge with the cylinder, so that the latter is effectively but yieldably maintained in a desired position against the forces of shock and vibration, without resisting intentional withdrawal.

The needle end 66c of each article 63c is received in a respective one of the apertures 42c, and may rest on the inner, rearward edge of the latter below the associated projection 85. In this manner, the projections 85 define detents or holding means which effectively prevent inadvertent elevation and withdrawal of the needles 66c from the apertures 42c, but which are readily displaceable to permit quick and easy manual withdrawal of the needle from the aperture.

From the foregoing, it is seen that the present invention provides a packaging carton for effectively protecting delicate objects, and a blank for use in making the carton, which fully accomplish their intended objects, and are well adapted to meet practical conditions of manufacture, storage, filling and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. A protective carton adapted to hold a plurality of delicate elongate objects, said carton comprising a bottom wall, upstanding parallel front and rear walls on the front and rear ends of said bottom wall, a ledge extending forward from said rear wall in spaced relation above said bottom wall, a plurality of laterally spaced separator strips depending from the forward region of said ledge and having their lower ends secured to said bottom wall, said strips each being located in a respective one of a plurality of parallel spaced planes disposed oblique to said front and rear walls, each adjacent pair of said strips defining therebetween a space opening forward obliquely toward said front wall, and a panel extending generally rearwards from the upper region of said front wall and formed with a plurality of laterally spaced openings each disposed opposite to a respective one of the spaces between said separators along a line perpendicular to said front and rear walls, each of said obliquely forwardly opening spaces thus being out of alignment with its respective opposite panel opening, whereby a plurality of said objects may be arranged in side by side relation each having one end received beneath said ledge in the space between an adjacent pair of said separators and having its other end received in the opposite one of said panel openings with said one object end in engagement with the front and rear edges of respective adjacent strips.

2. A protective carton adapted to hold a plurality of delicate elongate objects, said carton comprising a normally horizontally disposed generally rectangular bottom wall, generally vertical front and rear walls extending upwards from the front and rear edges of said bottom wall, a generally horizontal ledge extending forward from the upper edge of said rear wall in spaced relation above the rear portion of said bottom wall, a plurality of laterally spaced generally parallel separator strips depending from the forward region of said ledge and having their lower ends secured to said bottom wall, said separator strips being disposed respectively in generally vertical parallel spaced planes extending transverse of the front and rear edges of said bottom wall, a panel extending from the upper edge of said front wall generally rearwards and downwards to said bottom wall, said panel being formed with a plurality of laterally spaced openings each located opposite to a respective one of the spaces between said separator strips, and a laterally extending ridge upstanding from said bottom wall located in spaced relation between said separator strips and panel, said ridge being formed with a plurality of laterally spaced upwardly opening notches each in respective alignment with an opposed pair of said panel openings and spaces between said separator strips, whereby a plurality of said objects may be arranged in continuous side by side relation each having one end snugly but removably received beneath said ledge

in the space between an adjacent pair of said separator strips its other end received in the opposite one of said panel openings and its intermediate region in the respective aligned notch.

3. A protective carton according to claim 2, said separator strips being disposed respectively in generally vertical parallel spaced planes extending oblique with respect to the front and rear edges of said bottom wall, whereby said one ends of said objects are adapted to be snugly received in the spaces between said strips in engagement with the front and rear edges respectively of the adjacent pair of separator strips.

4. A protective carton according to claim 2, said separator strips being disposed respectively in generally vertical parallel spaced planes extending normal to the front and rear edges of said bottom wall, said one ends of said objects being adapted to be received in the spaces between said strips in closely adjacent relation therein.

5. A blank for a protective carton comprising a generally rectangular main panel, a generally rectangular forward extension hingedly connected to and laterally coextensive with the front edge of said main panel, a generally rectangular forward panel hingedly connected along and laterally coextensive with the forward edge of said forward extension and formed with a plurality of laterally spaced openings, a generally rectangular rearward extension hingedly connected to and laterally coextensive with the rear edge of said main panel, a rearward panel having its inner portion hingedly connected along and laterally coextensive with the rearward edge of said rear extension, said rearward panel having its outer portion of a lateral dimension substantially equal to that of its inner portion and offset laterally from said inner portion by an intermediate portion of said rearward panel, said rearward panel being formed with a plurality of generally parallel laterally spaced cuts disposed oblique to the hinged connection of said rearward panel and defining in the space between said cuts a plurality of strips, each adjacent pair of said strips having the space between its inner ends disposed opposite to a respective one of said forward panel openings, said rearward panel being provided with a first group of generally parallel fold lines each extending inwards from the outer end of a respective cut to the next adjacent cut and a second group of generally parallel fold lines each extending outwards from the inner end of a respective cut to its next adjacent cut, said first and second groups of fold lines being parallel to each other and disposed oblique to the hinged connection of said rearward panel, whereby said rearward panel is foldable along said fold lines to swing the outer portion of said rearward panel into a plane parallel to and spaced from the plane of the inner rearward panel portion with said strips disposed in parallel spaced relation with respect to each other extending between the planes of said outer and inner rearward panel portions and arranged oblique to the hinged connection of said rearward panel.

6. A blank for protective carton comprising a generally rectangular main panel, a generally rectangular forward extension hingedly connected along the forward edge of said forward extension and formed with a plurality of laterally spaced openings, a generally rectangular rearward extension hingedly connected to the rearward edge of said main panel, a rearward panel hingedly connected along the rearward edge of said rearward extension, said rearward panel being formed with a plurality of laterally spaced generally parallel cuts disposed oblique to the hinged connection of said rearward panel and defining in the spaces between said cuts a plurality of strips each

having its inner end disposed opposite to a respective one of said forward panel openings, said rearward panel being provided with a first group of generally parallel fold lines each extending inwards from the outer end of a respective cut to the next adjacent cut and a second group of generally parallel fold lines each extending outwards from the inner end of a respective cut to its next adjacent cut, the fold lines of said first and second groups being parallel to each other and each disposed oblique to the hinged connection of said rearward panel, said rearward panel being foldable along said fold lines to swing the outer portion of said rearward panel into a plane parallel to and spaced from the plane of the inner portion of said rearward panel with said strips disposed in parallel spaced relation with respect to each other extending between the planes of said outer and inner rearward panel portions and located in planes oblique to the hinged connection of said rearward panel when the latter is folded along said fold lines.

7. A blank for protective carton comprising a generally rectangular main panel, a generally rectangular forward extension hingedly connected to the front edge of said main panel, a generally rectangular forward panel hingedly connected along the forward edge of said forward extension and formed with a plurality of laterally spaced openings, a generally rectangular rearward extension hingedly connected to the rearward edge of said main panel, a rearward panel hingedly connected along the rearward edge of said rearward extension, said rearward panel being formed with a plurality of laterally spaced generally parallel cuts disposed oblique to the hinged connection of said rearward panel and defining in the spaces between said cuts a plurality of strips each having its inner end disposed opposite to a respective one of said forward panel openings, said rearward panel being provided with a first group of generally parallel fold lines each extending inwards from the outer end of a respective cut to the next adjacent cut and a second group of generally parallel fold lines each extending outwards from the inner end of a respective cut to its next adjacent cut, and a generally rectangular auxiliary panel hingedly connected to the rearward edge of said rearward panel and formed with a plurality of laterally spaced apertures each adjacent to the outer end of a respective one of said strips, said auxiliary panel being formed with a laterally extending fold line intersecting with said apertures, said rearward panel thus being foldable along said fold lines to swing the outer portion of said rearward panel into a plane parallel to and spaced from the plane of the inner portion of said rearward panel with said strips disposed in parallel spaced relation with respect to each other extending between the planes of said outer and inner rearward panel portions, and said auxiliary panel being foldable along said aperture intersecting fold line with said apertures defining notches each in adjacent relation with respect to the outer end of one of said strips.

References Cited in the file of this patent

UNITED STATES PATENTS

2,426,899	Pantalone	Sep. 22, 1947
2,559,552	Welshenbach	July 3, 1951
2,620,962	Powell	Dec. 9, 1952
2,660,361	Tyrseck	Nov. 24, 1953
2,737,337	Moore	Mar. 6, 1956

FOREIGN PATENTS

162,362	Great Britain	Apr. 25, 1921
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