Aug. 24, 1954 E. L. ARNESON 2,687,067

METHOD OF MAKING ARTICLE CARRIERS

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Fig. 1

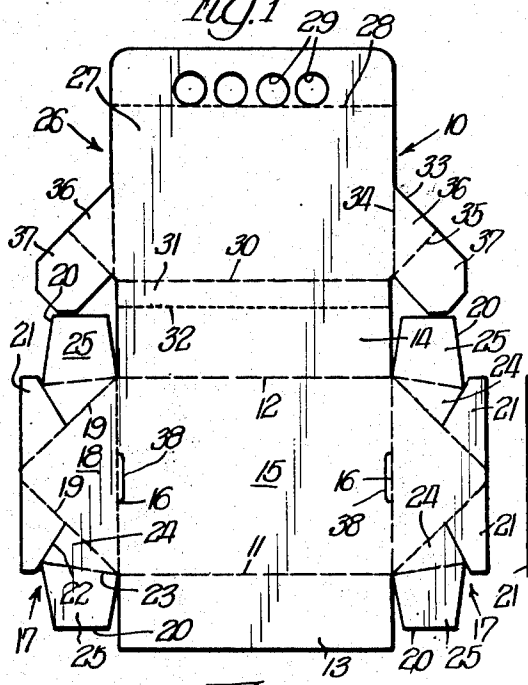


Fig. 2

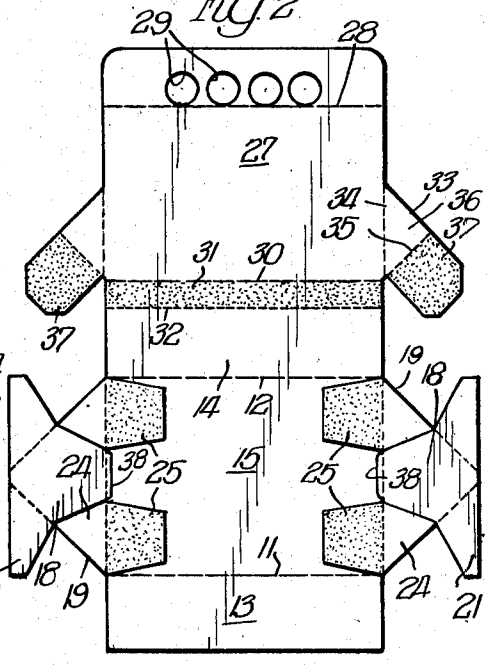


Fig. 3

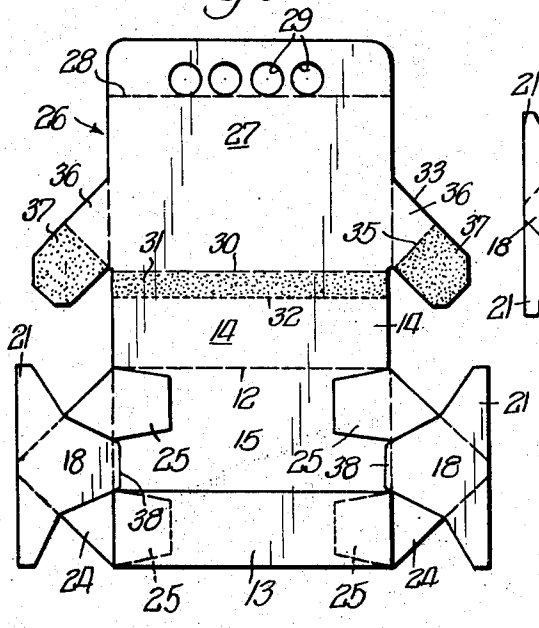
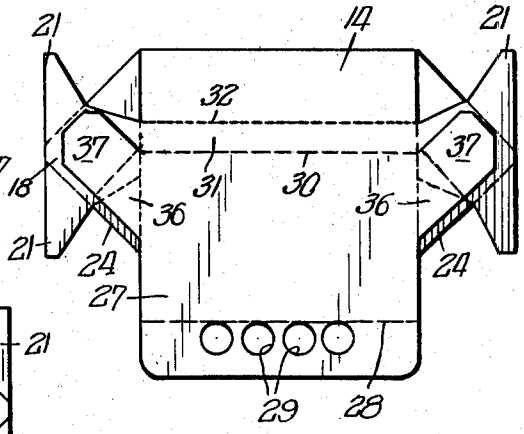


Fig. 4



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Fig. 5

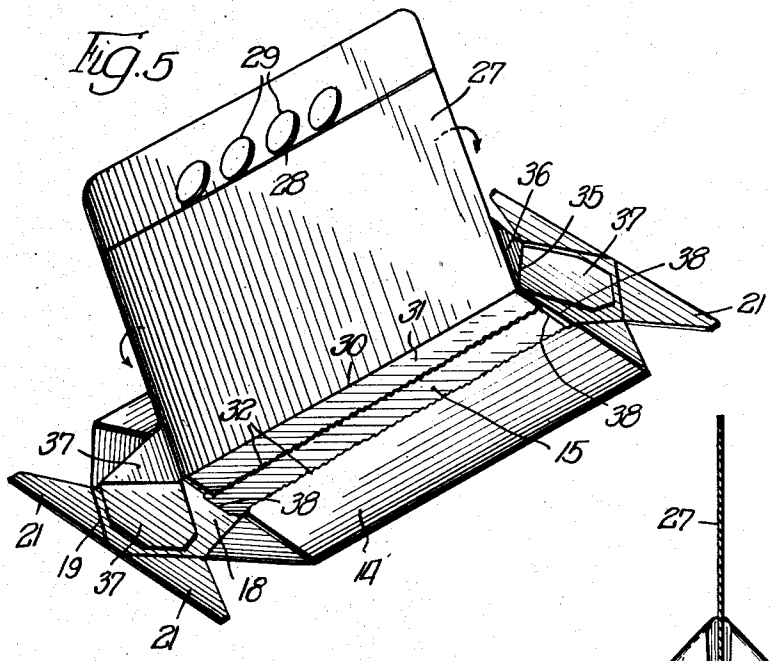


Fig. 7

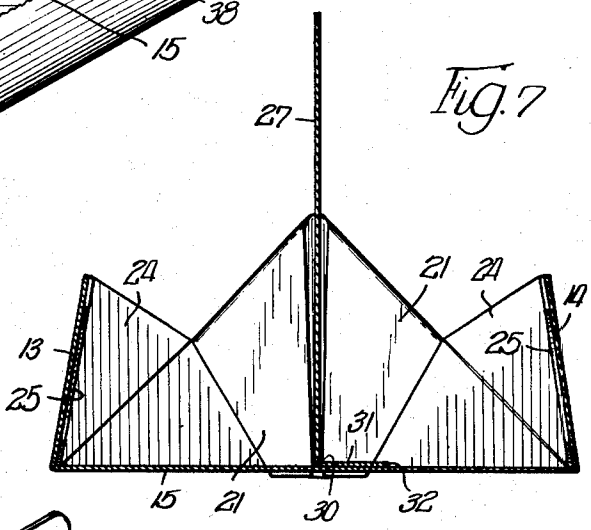
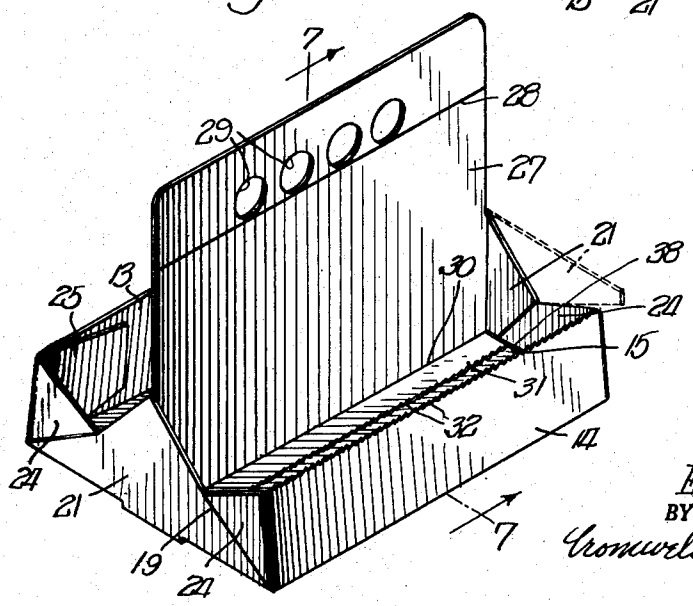


Fig. 6



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Fig. 8.

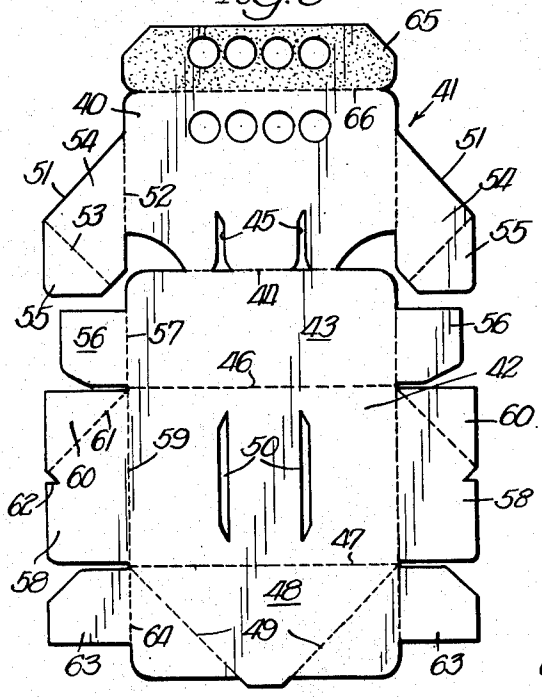


Fig. 9.

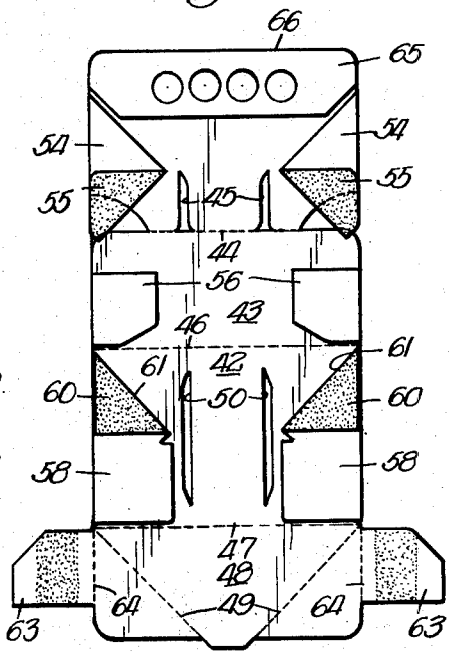


Fig. 10.

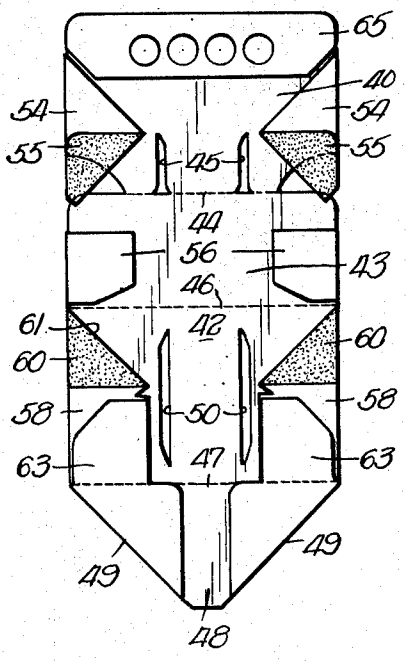


Fig. 11.

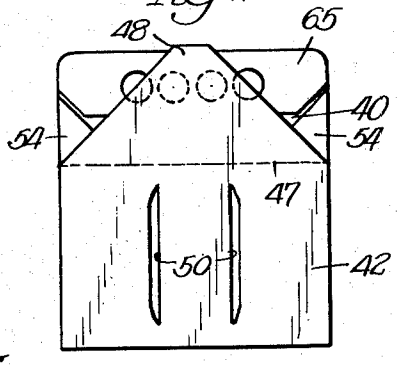
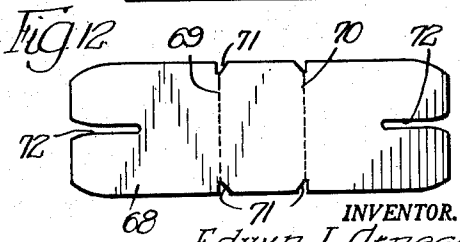


Fig. 12.



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Fig. 13

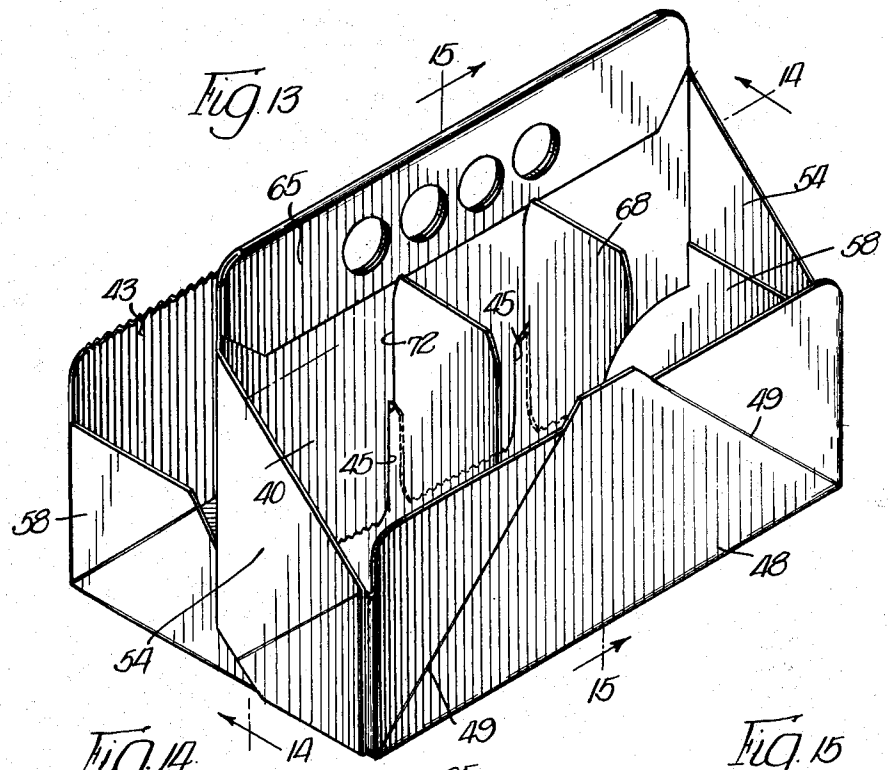


Fig. 14

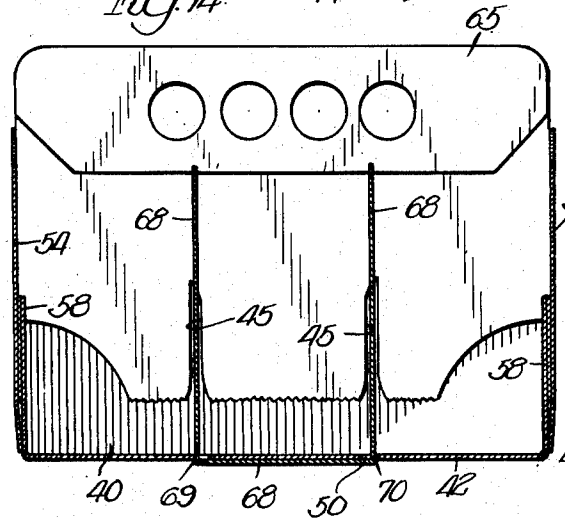
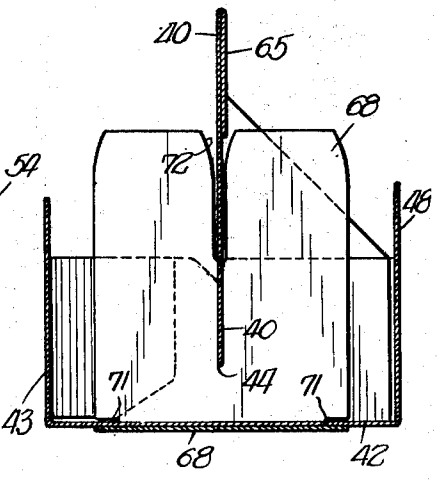


Fig. 15



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Patented Aug. 24, 1954

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UNITED STATES PATENT OFFICE

2,687,067

METHOD OF MAKING ARTICLE CARRIERS

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Application March 20, 1951, Serial No. 216,611

4 Claims. (Cl. 93—36)

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The present invention relates to an improved method of manufacturing on an existing gluing machine a paperboard carrier for a plurality of articles of uniform size and shape, such as bottles or cans.

It is an object of the invention to provide a collapsible paperboard article carrier which is fabricated from a one-piece blank and is characterized by a continuous, hingedly connected end and side wall structure and a longitudinal partition extending medially from end-to-end thereof, in which the partition is, in the flat, knock-down condition of the completed carrier, detachably connected to the wall structure for improved ease of handling the carrier, both during the course of its manufacture and for later packing, shipment and storage.

Another object is to provide an article carrier of the above sort in which, in one embodiment thereof, the medial, longitudinal partition is secured to the bottom of the carrier for increased load supporting strength.

More specifically, it is an object of the invention to provide an article carrier for a plurality of uniformly sized and shaped objects which has a sturdy end and side wall structure and bottom constituting a box-like or tray-like article receiver, and a partition extending longitudinally of the latter between its opposed end walls, which partition may be adhesively secured to the bottom by means of an integral glue lap and is temporarily connected integrally to one of the side walls, in the flat, knocked-down condition of the carrier, by means of a perforated line, which line is adapted to be broken or ruptured when the carrier is erected, enabling the wall structure and partition to be swung from a flat, knock-down condition to a right angle to the carrier bottom, with the longitudinal partition paralleling the side walls.

A further object is to provide a tray-like article carrier construction fabricated from a one-piece paperboard blank, which is entirely enclosed around its bottom side and end margins and which features a longitudinal partition formed integral with one of the side walls and glued to the bottom for increased ease of manufacture on existing gluing machinery, this partition being adapted to be quickly and easily separated from the side wall in erecting of the carton, yet retaining a strong adhesively secured connection to the bottom.

Yet another object is to provide a carrier as set forth in the preceding paragraph in which the longitudinal partition is further connected

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by a gusset connection to the end walls, in addition to the bottom connection referred to, in order to produce a very stable, strong carrier, notwithstanding the fact that a minimum of paperboard stock is employed in its construction.

A still further object of the invention is to provide an improved method of manufacturing an article carrier of the character set forth in the preceding paragraphs, especially well adapted to be performed on existing gluing and folding apparatus.

The foregoing statements are indicative in a general way of the nature of the invention. Other and more specific objects will be apparent to those skilled in the art upon a full understanding of the construction and operation of the device.

Two embodiments of the invention are presented herein for purpose of illustration, and it will be appreciated that the invention may be incorporated in other modified forms coming equally within the scope of the appended claims.

In the drawings:

Fig. 1 is a top plan view of the paperboard blank employed in the manufacture of the carrier, in accordance with one embodiment of the invention, illustrating the manner in which the blank is died out, creased and perforated as a preliminary to the folding operations;

Figs. 2, 3 and 4, are, respectively, top plan views illustrating successive folding and gluing operations which are performed on the blank of Fig. 1 in completing the carrier;

Fig. 5 is a perspective view illustrating the completed carrier in an intermediate position during final erection thereof from its flat, knock-down condition, shown in Fig. 4, to an erected condition;

Fig. 6 is a perspective view illustrating the carrier in a further stage of erection, indicating in dotted line the manner of manipulating certain end wall locking and bracing flaps to their final position;

Fig. 7 is a view in transverse vertical section along line 7—7 of Fig. 6, showing the partition and end wall construction of the carrier;

Fig. 8 is a top plan view of a blank employed in producing a modified embodiment of the invention;

Figs. 9, 10 and 11 are top plan views illustrating successive steps in the manipulation of the blank of Fig. 8 to completed knock-down condition, shown in Fig. 11;

Fig. 12 is a plan view of a separate, cell-defin-

ing element which is adapted to be associated with the modified form of carrier to sub-divide its interior into a plurality of equal sized, individual article receiving cells;

Fig. 13 is a perspective view showing the erected condition of the carrier and also indicating the operative relationship to that carrier of the cell-defining element of Fig. 12; and

Figs. 14 and 15 are, respectively, views in longitudinal and transverse vertical section along lines corresponding to 14—14 and 15—15 of Fig. 13, further illustrating internal structural characteristics of the improved carrier.

Referring to Figs. 1 through 4 of the drawings, illustrating a simple form of longitudinally partitioned carrier, characterized in completed condition by a bottom, end and side walls integrally conjoined thereto and a longitudinal medial partition paralleling the side walls, the reference numeral 10 generally designates a blank flexible paperboard stock from which the carrier is formed. This blank is subdivided into various panels as follows: A pair of parallel, longitudinally extending creases 11, 12 hingedly connect a pair of like rectangular side wall panels 13, 14 to a rectangular bottom forming panel 15 disposed between those creases. A pair of further creases 16 at right angles to creases 11 and 12 define the opposite end margins of the bottom panel 15 and serve to hingedly connect thereto the like end wall forming structures, generally designated 17. Each of these bottom end wall structures comprises a triangular end wall panel 18 immediately adjoining bottom marginal crease 16 and having its other two sides defined by inclined creases 19. Each crease 19 in turn hinges to the triangular panel 18 a gusset type glue flap 20 and an end wall lock flap 21, the respective flaps 20, 21 being separated from one another by an inclined slit 22 extending inwardly to crease 19. The end wall flaps 20 are each subdivided by an intermediate crease 23 into an inner gusset portion 24 and a glue lap or ear 25.

The end portion of the blank which adjoins the side wall panel 14 constitutes a longitudinal partition and handle structure, generally designated 26, and one of the features of the invention deals with the manner in which this partition structure of blank 10 is associated with the other components of the completed carrier. It comprises a rectangular longitudinal partition panel 27 provided, in spaced relation to its outer extremity, with a crease 28 along which it may be folded laterally for stacking of a number of the loaded carriers. Finger holes 29 adjoin the bend line 28. The opposite lower margin of the panel 27 is defined by a crease 30 which hingedly joins the same to a longitudinally extending glue strip or zone 31, and the panel 27 is adapted to be folded at a right angle along crease 30. The opposite longitudinal margin of glue zone 31 is defined by a weakened line of perforations 32 or by equivalent separable connection. This weakened connection holds the panel 27 to the remainder of the blank during successive steps of manufacture, thereby facilitating the folding and gluing operations. It also adds to the adaptability of the completed, knocked-down carrier for handling in shipment and storage. However the perforations which connect the partition to side wall panel 14 are readily ruptured when it is desired to put the carrier in use, allowing the side wall and partition to move apart in setting up the carrier, as will be hereinafter described.

The partition structure 26 is completed by a gusset type end wall connecting flap 33 on each end margin, hinged thereto by a crease 34. Flaps 33 are each in turn subdivided by a crease 35 into a triangular gusset portion 36 and a glue lap portion 37.

In forming the carrier from the blank of Fig. 1, the end wall flaps 20 at both ends of the bottom panel 15 are first folded inwardly about the respective angular creases 19 to the position illustrated in Fig. 2, after which adhesive is applied thereto in the zone which overlies the bottom panel, i. e., to glue laps 25, as indicated by stippling in Fig. 2. Adhesive may also be applied at this time to the glue zone 31 of the partition structure 26 and to the glue lap portions 37 of end flaps 33 of the latter, as also indicated by stippling in Fig. 2.

With the blank in this condition, the outer side wall panel 13 is folded upwardly, inwardly and downwardly about crease 11, as illustrated in Fig. 3, causing the same to adhere adjacent its opposite ends to the upwardly exposed, adhesive coated surface of glue laps 37. The blank is then folded upon itself about the inner bottom margin defining crease 12, as illustrated in Fig. 4, causing the side wall panel 14, the glue zone 31 and the partition panel 27 to overlie the previously folded portion of the blank, with the glue zone adhesively connected to the bottom panel 15, as illustrated in Fig. 4. The second set of glue laps 25 are adhered to the ends of side wall panel 14, and the glue lap portions 37 of the end flaps 33 on partition 27 are adhered to the inner surfaces of the triangular bottom end walls 18.

It will be noted that the line of perforations 32 continues to connect the glue flap or zone 31 of partition panel 27 with the side wall panel 14 and it will be appreciated that due to this temporary connection the completed, knocked-down carrier is well suited for ready handling in shipment or storage. It will also be appreciated that the temporary connection afforded by the line of perforations enables the carrier blank to pass endwise, in the direction of its length, through a straight line gluing machine, with a minimum tendency to snag, so that improved control of the blank in its passage through the gluing apparatus is obtained.

In erecting the completed knocked-down carrier, the first step is to sever the line of perforations 32 manually, leaving the longitudinal partition panel 27 secured by glue zone 31 to the carrier bottom 15. This may be accomplished simultaneously with the swinging of the opposed triangular end wall panels 18 inwardly and upwardly toward position normal to bottom 15, since this swinging tends automatically to shift the side wall panel 14 outwardly and upwardly with respect to the bottom glue zone due to the glued connections shown and described. Once the severance of the perforations 32 is accomplished the opposed side walls 13, 14 continue automatically to swing away from the bottom towards 90°, erected condition. As the end walls are swung inwardly toward one another the longitudinal partition likewise swings automatically toward vertical position, due to its gusset connection by flaps 33 to the end wall panels 18.

When the parts are in erected relationship, the generally triangular end wall locking tabs 21 are swung inwardly of the carton walls and downwardly, those on one side of the longitudinal partition being brought over the triangular gusset portions 36 of flaps 33 which lies in face-to-face engagement with end wall panel 18. The tips of

tabs 21 are then inserted into the openings provided by central U-shaped slits 38 formed in bottom end margins 16. They are thus held against return swinging movement.

The completed carrier is shown in Figs. 5, 6 and 7. The partition 27 is well braced at its margins adjoining the end walls, due to its adhesive securement by the gusseted flaps 37. The locking and bracing flaps 21 resist lateral sway of the partition and substantially stiffen the latter, by reason of their edge engagement with opposite sides of the partition at its ends and by their restraining action on the triangular gusset portions 36 which underlie the same. The carrier may be restored to inoperative, knocked-down condition by simply disengaging the tabs 21, whereupon the parts are returned readily to flat condition.

A modified embodiment of the invention is shown in Figs. 8 through 15, embodying the same general principles of construction and fabricated by a like method. In this form the longitudinal partition panel 40 of the longitudinal partition structure, which is generally designated 41, is not secured to the rectangular bottom panel 42. However, it is temporarily connected to the adjoining side wall panel 43 by the longitudinal series of perforations 44. Shaped, transversely extending slots 45, narrowed at their inner ends are formed in the lower margin of panel 40, which coincides with the perforations 44, for a purpose to be described.

Side wall panel 43 is hinged to a side margin of bottom panel 42 by a crease 46 and the opposite side margin of panel 42 is flexibly joined by crease 47 to a further side wall panel 48. The latter is subdivided by inclined creases 49 to render the same collapsible. Bottom panel 42 is also provided with two parallel, transverse slots 50 which are narrowed at their ends and extend across the major portion of the width of the bottom, in transverse alignment with the slots 45 in partition panel 40. Hence the latter are disposed immediately above slots 50 when the partition is operatively disposed at a right angle to and above the longitudinal center of bottom 42.

The end margins of the various panels referred to above have flap provisions flexibly connected thereto at opposite ends thereof in the following manner: The partition panel 40 has, at each end, an end wall bracing flap 51 flexibly articulated thereto by a marginal crease 52, the flap 51 being subdivided by an inclined crease 53 into a generally triangular, outer end wall connecting member 54 and a glue lap 55. Side wall panel 43 is equipped with a pair of end wall engaging flaps 56, hinged thereto by marginal creases 57. Bottom forming panel 42 includes an end wall defining portion 58, hinged thereto by marginal crease 59, and a glue lap 60 is articulated to panel 58 by inclined crease 61, which glue lap is adapted to be secured to the adjacent flap 56 on the side wall panel. Each of these end wall panels 58 is nicked at 62 adjacent a longitudinal medial line through bottom panel 42, this provision being intended for the reception and lateral bracing of partition panel 40 when the latter is erected to vertical position. The remaining side wall panel 48 is, like the opposite side wall panel 43, equipped with end wall engaging and bracing flaps 62, which are hinged thereto by marginal creases 64. The respective sets of flaps 54, 56, 58, 63 are separated from one another by slotting of the blank outwardly of their respective articulated creases, hence are individually foldable relative to the panels which they adjoin.

In completing the carrier from the blank of Fig. 8, the flaps 54 are swung inwardly about creases 52 onto the partition panel 40 and their respective glue laps 55 are reversely folded upwardly and downwardly to the position of Fig. 9. Similar operations are performed on bottom end wall panels 58 and their associated glue laps 60. The flaps 56 adjoining the side wall panel 43 are also folded inwardly upon that panel. At the same time, a top reinforcing and gripping flap 65 which may be integrally connected to partition panel 40 by a crease 66 may be folded inwardly and downwardly and secured to the panel 40 to reinforce the latter at its gripping zone. However, this feature may be dispensed with if desired.

With the blank in the position illustrated in Fig. 9 adhesive is applied in the manner indicated by stippling, i. e., to the out-turned side wall flaps 63, and to the respective pairs of triangular glue laps 55 and 60. The triangular portions of the side wall panels 48 which are defined by inclined creases 49 are now folded inwardly and downwardly about these creases, as illustrated in Fig. 10, causing the flaps 63 to adhere to the exposed upper surfaces of the end wall panels 58 of bottom 52. The blank is completed by folding the bottom and the thus folded side wall about the bottom defining crease 46 to the position illustrated in Fig. 11.

This adhesively secures the glue laps 60 of the end wall panels to the in-turned side wall end flaps 56, as well as the triangular glue laps 55 of the longitudinal partition 40 to the end flaps 63 of side wall panel 48. The partition panel 40 remains temporarily secured to side wall 43 by the line of perforations 44, but is freed therefrom when the carrier is erected. This is accomplished by swinging the infolded end wall structure outwardly, exerting pressure on the line of perforations to assist in rupturing the same. As the end wall structures swing towards the vertical, the freed side wall likewise swings outwardly, the partition panel 40 swings to the vertical and the opposite, angularly creased and folded side wall panel 48 also straightens from collapsed to planar position while swinging inwardly toward the vertical. Engagement of the end margins of longitudinal partition 40 in the nicks 62 in the end wall panels 58 resists return swinging of the longitudinal partition and thus tends to brace the carton as a whole in its fully erected condition, shown in Figs. 13–15.

In the event it is desired to convert the carrier to one which is further subdivided into cells on opposite sides of its longitudinal partition, particularly when bottles or other breakable articles are to be transported, it is only necessary to employ the separate cell unit shown in Fig. 12 and designated by the reference numeral 68. This is an elongated, generally rectangular strip of flexible paperboard, subdivided adjacent its middle by two transverse score lines 69, 70. These lines are spaced from one another in accordance with the spacing of the bottom slots 50 and longitudinal partition slots 45. Nicks 71 are provided at the opposite termini of creases 69, 70, and the opposing ends of the element 68 are provided with longitudinally extending slots 72 which approximate in length the length of the partition slots 40. In use, the element 68 is bent about creases 69, 70 to a U-shaped outline and, with the carrier in erected condition, is thrust upwardly through the

slots **50**, causing its slots **72** to mate with partition slots **45** and to engage opposite sides of the partition **40**. The nicks **71** catch and interlock with opposite narrowed ends of the bottom slots **50**, thereby vertically sustaining the cell defining unit **68** in place, in the fashion illustrated in Figs. 13, 15 and 16 of the drawings. Thus there is afforded a carrier construction which is readily converted by a simple manipulation from a non-cellular, two-division carrier for non-breakable articles, such as cans, to a cellular type for articles requiring a greater degree of individual protection.

In both embodiments, the carrier employs a minimum of stock but which is amply strong for its intended purposes. Either form may be easily and quickly returned from erected condition to a flat, knocked-down condition, when desired.

I claim:

1. A method of manufacturing article carriers comprising preparing a blank of flexible paperboard stock by creasing the same along parallel lines to define a pair of side wall panels, a bottom panel lying between and integrally hinged by longitudinal creases to said side wall panels, a longitudinal partition panel lying adjacent one of said side wall panels, and a portion integrally connecting said partition panel and adjacent side wall panel, forming a weakened and readily severable but integral longitudinal connection between said portion and adjacent side wall panel, folding said blank at the crease connecting said bottom panel to said adjacent side wall panel to bring said adjacent side wall panel, said weakened connection, said connecting portion and said partition panel into overlying relation to the remainder of the blank, with said portion and weakened connection extending longitudinally and medially along said bottom panel, securing said portion to said bottom panel, and thereafter severing said weakened connection to detach said longitudinal partition panel from said adjacent side wall panel.

2. A method of manufacturing article carriers comprising preparing a blank of flexible paperboard stock by creasing the same along parallel lines to define a pair of side wall panels, a bottom panel lying therebetween and integrally hinged thereto by certain of said creases, and a longitudinal partition panel lying adjacent one of said side wall panels and integrally hinged thereto by another of said creases, forming a weakened and readily severable but integral longitudinal connection in said partition panel paralleling said hinge crease thereof, thereby to define an attaching zone paralleling said hinge creases, folding said blank at the crease connecting said last named side wall panel to said bottom panel to bring said last named side wall panel and said partition panel into overlying relation to the remainder of the blank, with said weakened connection and attaching zone extending longitudinally and medially along said bottom panel, adhesively securing said zone to said bottom panel while leaving all said other panels free from each other, and thereafter severing said weakened connection to detach said longitudinal partition panel from said adjacent side wall panel and to define a free lower edge therefor.

3. A method in accordance with claim 2 in which the preparation of the blank includes the further operation of providing a pair of spaced transverse parallel cuts in said partition panel which are spaced from the ends thereof and extend from said weakened connection substantially inwardly toward the opposite margin of the panel.

4. A method in accordance with claim 2 in which the preparation of the blank includes the further operations of providing a pair of spaced transverse parallel cuts in said partition panel which are spaced from the ends thereof and extend from said weakened connection substantially inwardly toward the opposite margin of the panel and of providing a correspondingly spaced pair of parallel cuts in said bottom panel in transverse alignment with said first named cuts.

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