Feb. 22, 1966 R. H. JOHNSON 3,236,437

END CLOSURE WITH LIFTING FLANGE MEANS FOR PAPERBOARD CARTONS

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Fig. 1

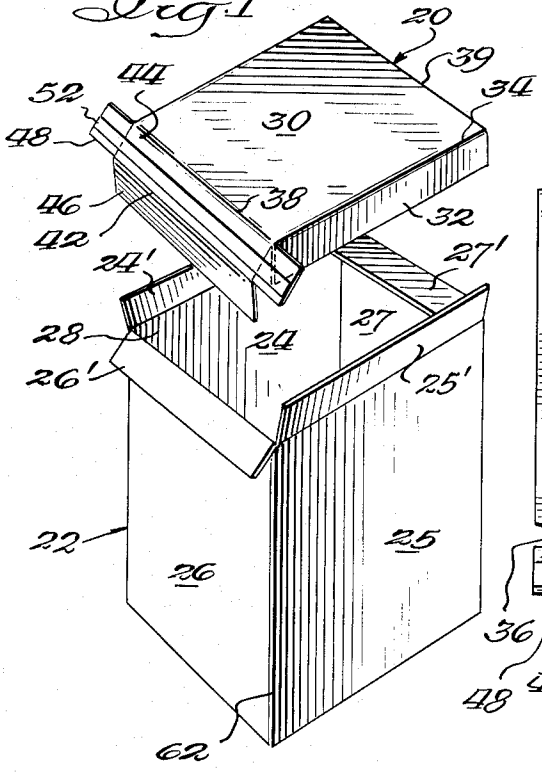


Fig. 3

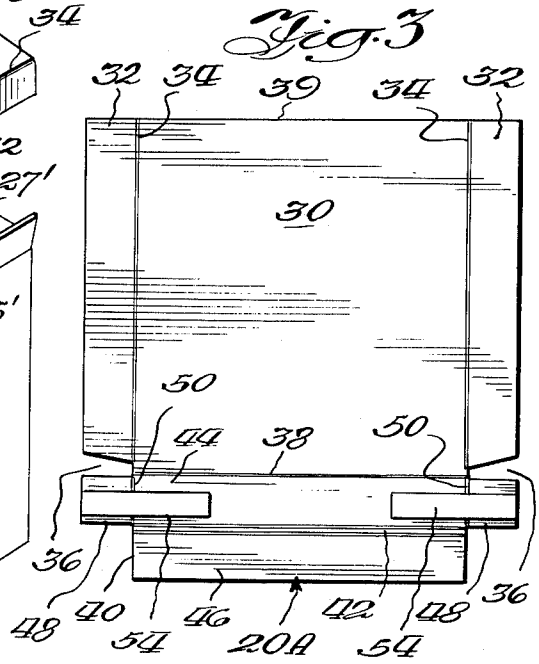
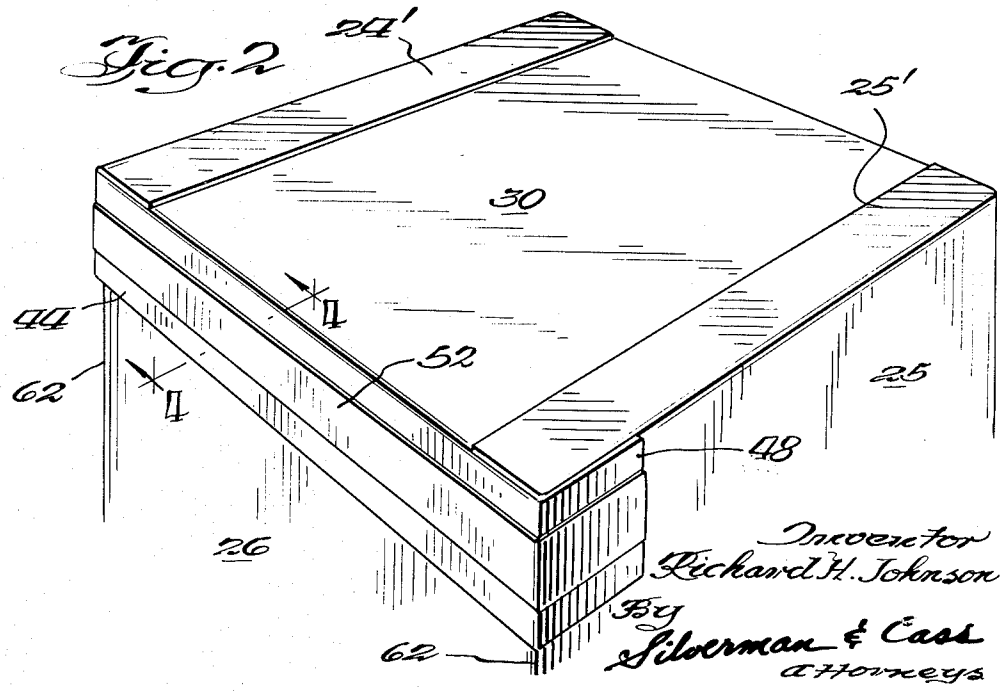


Fig. 2



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Fig. 6

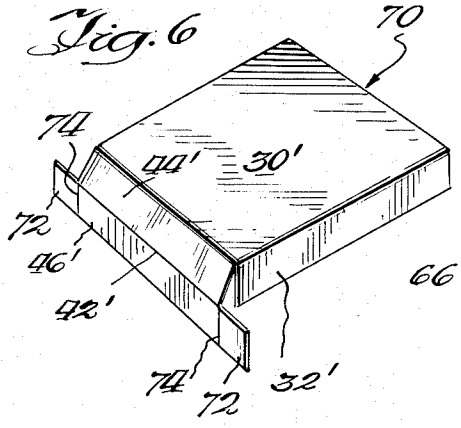


Fig. 4

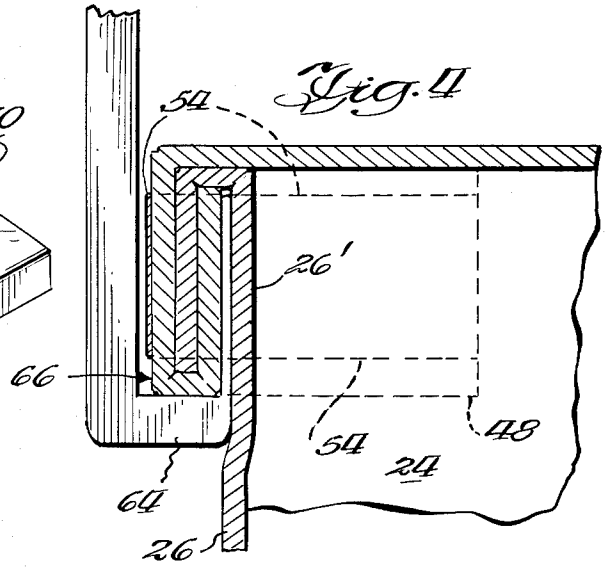


Fig. 7

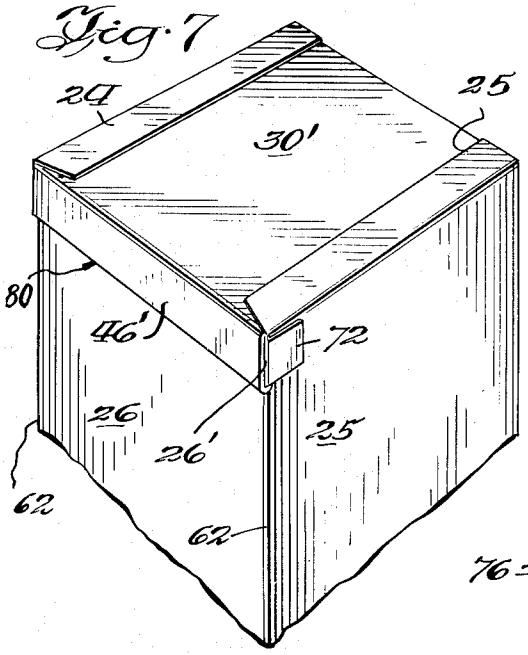
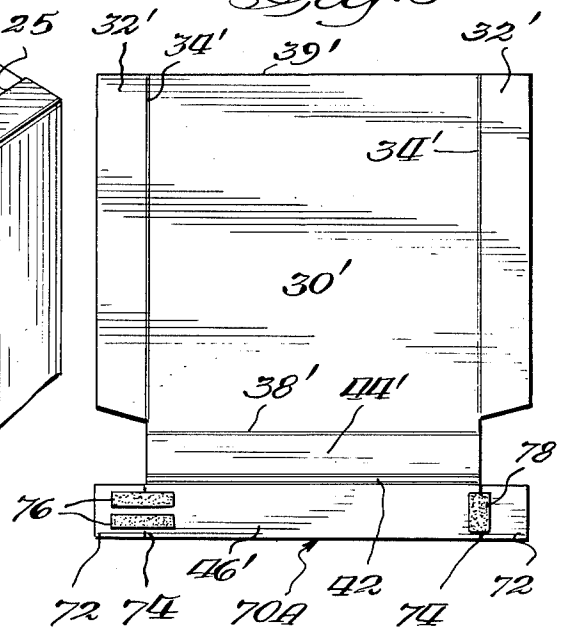


Fig. 5



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Fig. 10

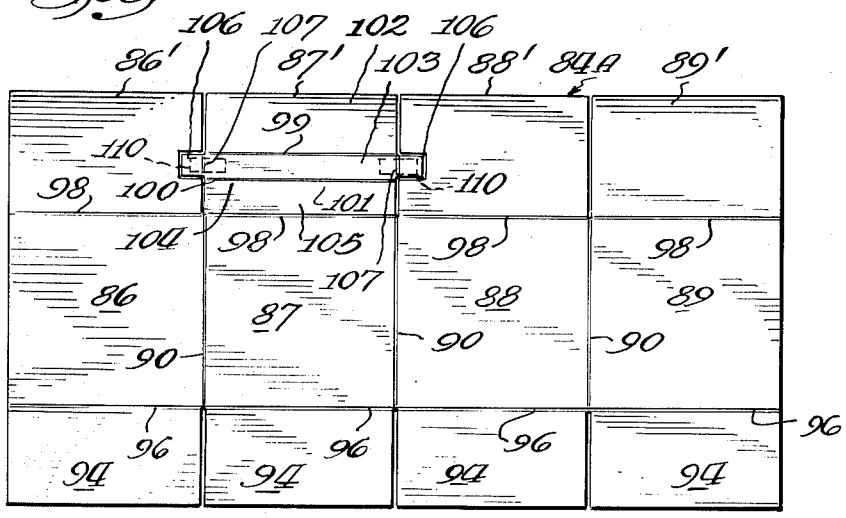


Fig. 8

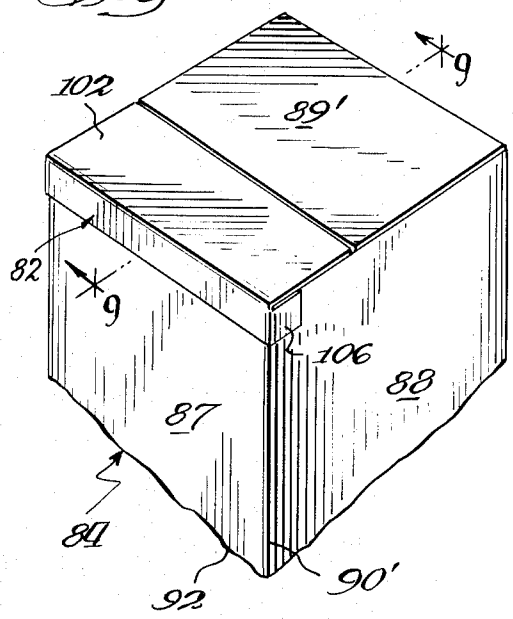
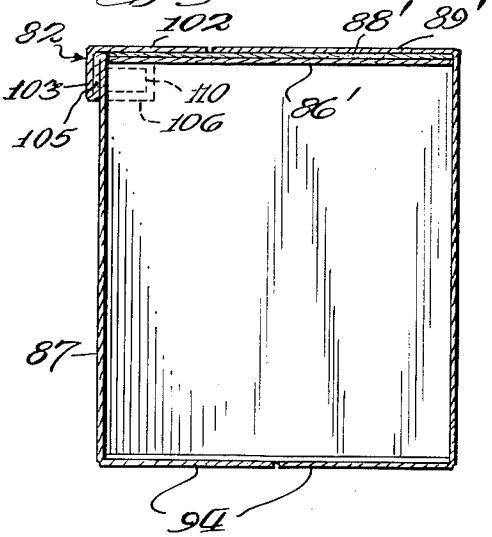


Fig. 9



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END CLOSURE WITH LIFTING FLANGE MEANS FOR PAPERBOARD CARTONS

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Filed Apr. 2, 1964, Ser. No. 356,747
6 Claims. (Cl. 229—45)

This invention relates generally to paperboard cartons and more particularly, relates to a novel end closure for corrugated paperboard or the like cartons having lifting flange means adhesively secured in position on the carton capable of being engaged by a mechanical lift device.

In the packaging and shipment of bulky and large household appliances, for instance, it is common to employ a corrugated paperboard container which consists of an elongate sleeve or tube open at opposite ends thereof and capped by an end closure of corrugated paperboard. Suitable spacers are provided on the interior of the sleeve for spacing the appliance from the walls and ends of the carton. To secure an end closure or end cap, as it is referred to commonly in the trade, to the sleeve, it has been known to employ suitable cooperating flaps or flanges on the cap and the adjacent sleeve end respectively which can be interlocked to form joints which thereafter are strapped or banded in a well-known manner. There results joints of multiple thicknesses of corrugated board about the periphery of the end of the carton and overlying the sides of the sleeve. Such end closures have been employed for many years in various forms.

In practice, it is common to build a carton on a pallet, runners or short legs which can be lifted by engaging the pallet with the fork of a lifting machine. Another technique employed has been capping at least the upper end of the sleeve using metal straps or other bands and engaging a lifting spade or blade between the sleeve and said multiple thicknesses of corrugated board at the capped upper end of the carton for lifting the carton. Such a technique eliminates the need for pallets, however, the use of metal bands has been continued.

It is a primary object of the invention to provide a novel end closure for paperboard cartons which successfully eliminates the need for strapping or banding over interlocked flanges or flaps of an end cap and sleeve as heretofore practiced and yet, which permits lifting of the carton by means of a lifting spade or blade engaged between a multiple thickness lifting flange and a side wall of the sleeve at the upper closed end of the sleeve.

Another object of the invention is to provide an end closure of the character described having a multiple thickness interlocked joint along only one side of the sleeve to provide a lifting flange for the carton and which is adhesively secured to a pair of sides of the sleeve other than the side of the sleeve along which said lifting flange is formed.

Another object of the invention is to provide a novel end closure for paperboard cartons having a hinged flap arranged to be interlocked with a hinged flap on the sleeve of the carton to form a multiple-thickness lifting flange along one side and adjacent the upper end of the carton, the hinged flap of said end closure arranged to be reenforced and adhesively secured to said sleeve for anchoring said lifting flange.

Another object of the invention is to provide an end cap construction of the character described comprising, a

rectangular body or panel having a flange or flap hingedly connected along one side edge thereof, said flange being longitudinally scored to divide the same into at least a pair of interconnected strips, one of said strips having hinged end or corner flaps which are reenforced, said corner flaps constructed and arranged to be adhesively secured to the sleeve for holding the end cap on the sleeve without requiring metal bands or straps and yet, permitting lifting of the carton by engaging the lifting blade or spade between the interlocked flanges and the sleeve.

Another object of the invention is to provide an end closure of the character described in which the lifting flange has a pair of corner flaps at opposite extremities thereof arranged to be folded against and adhesively secured to opposite sides of the sleeve for anchoring the lifting flange.

The foregoing and another advantages of the invention will become apparent from the ensuing disclosure in which a preferred embodiment and modified forms of the invention are described in detail and illustrated in the accompanying drawing. It is contemplated that minor variations in structural features and arrangement of parts thereof may occur to the skilled artisan without departing from the scope or sacrificing any of the advantages of the invention.

In the drawings wherein the same reference characters are employed to identify the same or equivalent parts throughout the several figures thereof:

FIG. 1 is an exploded perspective view of a paperboard carton which employs one form of end closure with lifting flange embodying the invention.

FIG. 2 is an enlarged, fragmentary perspective view showing said end closure of FIG. 1 secured over the upper end of the sleeve of a paperboard carton.

FIG. 3 is a plan view of a blank from which said end closure of FIG. 1 is formed and showing an alternate way of re-enforcing said end closure in accordance with the invention.

FIG. 4 is a fragmentary sectional view taken generally through the carton along the line **4**—**4** of FIG. 2 and diagrammatically showing a blade engaged with the lifting flange at the upper end of a carton for lifting the same.

FIG. 5 is a plan view of a blank from which a modified form of end closure embodying the invention is realized.

FIG. 6 is a perspective view of the blank of FIG. 5 in a partially folded condition for assembly to the sleeve of a carton shown in FIG. 1.

FIG. 7 is a fragmentary perspective view showing the end closure of FIG. 6 secured to the upper end of the sleeve of a carton such as shown in FIG. 2.

FIG. 8 is an enlarged fragmentary perspective view of another modified form of end closure embodying said invention assembled on a paperboard carton.

FIG. 9 is a sectional view taken longitudinally through the carton of FIG. 8.

FIG. 10 is a plan view of a blank from which the carton with end closure of FIG. 8 is formed.

Referring now to the drawings, one embodiment of the invention is designated generally by the reference character **20** in FIG. 1. This form of end closure comprises a closure for corrugated cartons known in the trade as an end cap. Accordingly, this embodiment of the invention will be referred to as the end cap **20** with the understanding that it is a specific type of end closure to which the principles of the invention have been applied.

The end cap **20** is constructed for use in corrugated or other type paperboard cartons for packaging and shipping bulky and heavy household appliances such as re-

frigerators, washers, cooking ranges and the like. Such a representative carton is shown in FIG. 1 as including the sleeve 22 formed of corrugated board which is to be capped at least at the upper end thereof by said end cap 20, which likewise is formed of corrugated board. The sleeve 22 has an elongate, rectangular configuration defined by the parallel side walls 24 and 25 and the parallel side walls 26 and 27 connected at right angles to said side walls 24 and 25. The sleeve 22 normally is open at opposite ends thereof. The end cap 20 embodying the invention may be used at either or both of the open ends of the sleeve although, in FIG. 1, an end cap 20 is illustrated for application only to the upper end 28 of the sleeve.

Each of the side walls 24 through 27 have flaps 24' through 27' respectively hinged to the upper ends thereof, each of said flaps 24'–27' being substantially co-extensive with the side wall of the sleeve to which it is connected. Thus, the open upper end 28 of the sleeve has flaps entirely around the margin or rim thereof.

The end cap 20 is comprised of a central body or panel 30 which is imperforate. The panel 30 is rectangular in configuration and dimensioned to coincide geometrically with the cross-sectional area and configuration of the sleeve 22. The panel 30 may be made also of more than one ply of material, such as, for instance, as disclosed in U.S. Patent No. 2,887,263 owned by the same assignee as the herein application. Along a pair of opposite, parallel side edges of the panel 30 are the flaps 32 each hingedly connected along a fold line 34. Each of the flaps 32 is slightly shorter in length than the length of the side edge to which it is hinged so as to provide the notch 36 at one extremity of the flap. Of the second pair of opposite side edges of the panel 30, edge 38 has a flap or flange 40 hingedly connected thereto whereas the opposite edge 39 does not have a flap or flange connected thereto so that the opposite ends of the flaps 32 are flush with side edge 39. However, a flap could be provided secured to edge 39 without interfering with the invention.

The flange or flap 40 is coextensive in length with the side edge 38. A longitudinally extending line of fold 42 spaced from and parallel with the edge 38 divides the flap 40 into a pair of panels or parts 44 and 46 of which the panel or part 44 is located next adjacent the body section 30. To each extremity of the part 44 is hingedly connected a flap 48 along the fold line or hinge 50. The flap 48 extends outwardly from strip 44 and will be referred to as corner flaps. It may be noted that the width of each corner flap 48 is substantially identical to the width of strip 44. Also, each corner flap 48 is substantially identical in length to the width of a flap 32. As seen in FIG. 3, each corner flap 48 is separated from the flap 32 adjacent thereto by the notch or space 36. It will be seen from FIG. 3 that the blank designated generally 20A from which the end closure 20 is formed features a configuration which can be die cut or stamped out by means of high speed machines for suitable mass-production requirements.

It is the corner flap 48 which is reenforced to realize the advantages of the invention. More specifically, the panel or part 44 and the corner flaps 48, including the hinges or folds 50, are reenforced as described hereinafter.

Referring to FIGS. 1 and 2, a continuous strip 52 of reenforcement material is shown secured longitudinally across strip or part 44, the lines of fold 50 and corner flap 48. In this embodiment, the reenforcement strip 52 is secured to the outside surfaces of the part 44 and corner flaps 48. The invention contemplates also employment of a like reenforcing strip member secured to the opposite or inside faces of part 44 and flaps 48 either concurrently or independently of the first mentioned strip 52, as shown in FIG. 7. Also, such a reenforcing strip member can be located between the outside facing plies and the corrugated medium of the conventional corrugated board. Further, although a single wide reenforcing strip member 52 has been shown in each of the embodiments of FIGS. 1 and 7, more than one strip arranged side by side may be employed each of which is narrower than the strip 52 illustrated. Also, instead of a single strip extending continuously between extremities of the corner flaps 48, a pair of reenforcing strips 54 of shorter length can be used, each such strip being applied across a flap 48 and a fold 50 as shown in FIG. 3. Here, a strip 54 extends across the length of the flap 48 and only across a portion of the panel or part 44.

The reenforcing strip 52 or 54 may comprise a kraft paper tape either with or without filaments reenforcing the tape. The important consideration is that the tape strip such as at 52 or 54 be applied across the flap 48 and the hinge 50 at which the flap 48 is secured to the panel or part 44. As will become apparent hereinafter, such a reenforcing strip 52 or 54 may be applied to extend transverse to the hinge 50 or parallel therewith.

To assemble the end cap 20 to the sleeve 22, the end flap or flange 27' of the sleeve 22 is bent toward the inside of the sleeve and arranged generally perpendicular to the longitudinal axis of the sleeve. The remaining flaps 24', 25' and 26' are bent away from the inside of the sleeve. The flaps 32 and flange 40 are bent downwardly to form the cap 20 into a shallow, tray-like member and poised over the open upper end 28 of the sleeve, as shown in FIG. 1. The panel 30 then is positioned across said open end 28 supported on the flap 27' and with the flaps 32 tucked downwardly into the sleeve abutting side walls 24 and 25 respectively. The flap or flange 40 is located exterior of the sleeve in juxtaposition to flap 26'.

Then, flaps 24' and 25' are bent upwardly and over to be engaged upon the outside face of panel 30. In this position, the flaps 24' and 25' are adhesively secured to the panel 30, as illustrated in FIG. 2.

Referring to FIG. 4, there is shown a lifting blade 64 inserted between the multiple thickness interlocking flaps and the adjacent side wall 26 of the sleeve. The interlocked flaps are now identified generally by reference character 66 and will be referred to hereafter as the lifting flange 66. It can be noted that the lifting flange 66 is provided only along one side 26 of the sleeve and is anchored by means of the corner flaps 48 adhesively secured to side walls 24 and 25 of the sleeve. Lifting of the blade 64 against flange 66 does not result in the lifting flange 66 being torn away from the sleeve by reason of the corner flaps 48 being adhesively secured to the sleeve and the reenforcing tapes across hinges 50.

Referring to FIGS. 5–7, a modified form of end cap having the invention embodied therein is identified generally by the reference character 70. The end cap 70 is very similar to end cap 20 so that like reference characters albeit, primed, have been used for corresponding parts of the two pads. The difference in structure resides in placement of the corner flaps 72 at the ends of the panel part 46, as best seen in FIG. 5 where the blank from which end cap 70 is erected is designated 70A. The hinges 74 between panel 46' and the corner flaps 72 are reenforced by tape members applied thereacross. Two ways of applying the reenforcing tapes are shown in FIG. 5. For the left hand flap 72, there is shown a pair of narrow tapes 76 spaced apart and applied transversely across hinge 74. Tapes 76 do not reach to the extremity 78 of the flap 72. For the right hand flap 72, a single wider tape 78 is applied across the hinge or fold line 74 in the direction of said line 74. Also, it will be appreciated that the reenforcing tapes are applied to the inside surfaces of part 46' and the flaps 72.

Referring to FIG. 6, the end cap 70 is shown folded to form the shallow tray formation similar to that shown in FIG. 1 for pad 20. In FIG. 7, the end cap 70 is secured on the end of the sleeve 22 and anchored by means of corner flaps 72 adhesively secured to the side wall 25

and the opposite side wall **24** which is not seen in this view. The interlocked flaps **46'**, **44'** and **26'** form a lifting flange designated generally **80** in FIG. 7 which is anchored to the sleeve by the corner flaps **72**. The reenforcing tapes **78** and/or **76** are on the inside surfaces of part **46'** and flaps **72**, as can be appreciated from FIG. 7.

Referring to FIGS. 8–10, another embodiment of the invention is illustrated wherein the lifting flange is provided in combination with an end closure for a carton without resort to a separate end cap construction, such as **20** or **70**. The lifting flange of this embodiment is designated generally by the reference character **82** in FIGS. 8 and 9. Here, the lifting flange **82** is formed on a conventional slotted style carton **84** as distinguished from the separate end cap construction subsequently mounted on an end of a sleeve. The blank from which the carton **84** is erected is designated **84A** in FIG. 10.

The blank **84A** has four rectangular panels **86, 87, 88** and **89** secured together edge-to-edge along individual hinge lines **90**. The blank **84A** is to be folded and erected to provide a rectangular sleeve **92** such as partially shown in FIG. 8. Considering the sleeve **92** to be vertically oriented in FIGS. 8 and 9, there is a flap **94** hingedly secured to the bottom edge of each of said panels **86–89** along a line of fold **96**. Each flap **94** is co-extensive with the panel to which it is secured. To the upper edges of the panels are hingedly connected individual flaps **86'**, **87'**, **88'** and **89'** along the hinge lines **98** respectively. These flaps **86'–89'** likewise are each coextensive with the panel to which it is secured, as best seen in FIG. 10. Each of the flaps **86'–89'** is longer than a flap **94**, the dimension of length being considered from the hinge line of connection of the flap to the opposite outside edge of the flap, as viewed in FIG. 10.

The lifting flange **82** is formed on the flap **87'**. The flap **87'** has parallel transverse lines of fold **99**, **100** and **101** which demarcate the flap **87'** into narrow strips or parts **102**, **103**, **104** and **105**. The part **103** has a pair of corner flaps **106** hingedly connected to the extremities thereof along the lines of fold **107**. The corner flaps **106** correspond to the corner flaps **72** and **48** of the other embodiments of the invention previously described. As seen in FIG. 10, flaps **106** can be struck from the flaps **86'** and **88'** respectively.

Referring to FIG. 10, the carton **84** is erected by folding the panels **86–89** along the lines of fold **90** to form a rectangular sleeve and securing the abutting edges of the panels **86** and **89** together in a well known manner. To close the bottom of the resulting sleeve **92**, flaps **94** on facing panels are folded inwardly into the sleeve into an overlapping assemblage of flaps which can be secured together in a well known manner. For closing the upper end of the sleeve **92**, flaps **86'** and **88'** are folded inwardly initially. Then flap **89'** is folded inwardly overlying this assemblage of flaps **86'** and **88'** and secured in place. The flap **87'** is folded inwardly along the hinge line **98** and thereafter part **105** is folded downwardly along said hinge line **98** and part **103** is folded outwardly and upwardly along the lines of fold **100** and **101**. Then part **102** can be folded over upon the assemblage of flaps **86'** and **88'** and secured thereto. This forms a multiple thickness flange **82** overlying the panel **87** of the sleeve, as seen in FIG. 9. The corner flaps **106** can then be bent along the lines of fold **107** to engage them against panels **86** and **88** respectively and then, to be adhesively secured thereto. Thus, the corner flaps **106** pass around the corners **90'** of the sleeve **92**, as shown in FIG. 8.

Referring to FIG. 10, there has been illustrated in broken outlines **110** re-enforcing strip members applied across the lines of fold **107** connecting the corner flaps **106** to the part **103**.

It will be noted that the parts **105** and **103** are substantially identical in width so as to form the multiple thickness lifting flange **82**. The part **102** does have an important function of assisting to anchor the lifting flange **82** on the carton. In lifting the carton **84**, it is primarily the corner flaps **106** which anchor the lifting flange to the sleeve so as to permit a lifting blade to be engaged between the flange and panel **87**. The strips **110** reenforce the joint between the corner flaps **106** and strip or part **103**.

It is believed that the invention in its various embodiments has been sufficiently described to enable the skilled artisan to understand and practice the same. The invention has been distinctly pointed out in the appended claims intended to be broadly and liberally construed.

What it is desired to secure by Letters Patent of the United States is:

1. In a paperboard carton having an elongate sleeve of rectangular cross-section open at the upper end thereof and an end closure secured across said open end, means carried by said end closure for lifting the carton with a conventional lifting blade comprising, a multiple-thickness flange comprised of a pair of interlocked flaps carried by said sleeve and said end closure, said flange being coextensive with one side wall of the sleeve adjacent said open end and exterior of the sleeve, said flange also having opposite ends and a corner flap member hingedly connected to each of said flange ends and adhesively secured to a pair of opposite side walls of said sleeve other than said one side wall for anchoring said flange and reenforcing means secured across said hinged connection of each of said flaps to strengthen the same to permit insertion of said lifting blade between the flange and said one side wall.

2. In combination, a paperboard sleeve of rectangular cross-section having interconnected side walls and open at the upper end thereof and an end closure for said sleeve to close said open end, said end closure having multiple-thickness flange means for lifting the carton with a conventional mechanical lifting blade, said means being coextensive with one side wall of the sleeve and juxtaposed the outside surface of said one wall adjacent said open end, corner flap members hingedly connected at opposite ends of said flange means, said flap members arranged perpendicular to said one side wall and adhesively secured to the pair of opposite side walls of the sleeve connected to said one side wall, and reenforcing means secured across said hinged flap connection to strengthen the same.

3. The structure described in claim **2** in which said reenforcing means comprise strips of adhesive tape.

4. The combination of claim **2** in which said end closure is fabricated from a first blank, and said sleeve is fabricated from a second blank, and said flange means comprise interlocked flaps carried by said sleeve and said closure.

5. The combination of claim **2** in which said end closure and said sleeve are formed from the same blank, and said flange means is integral with said end closure.

6. In a paperboard carton having an elongate sleeve of rectangular cross-section open at the upper end thereof and an end closure secured across said open end, means carried by said end closure for enabling lifting the carton with a conventional blade comprising,

(a) a multiple-thickness flange coextensive with one side wall of the sleeve adjacent said open upper end and exterior of the sleeve,

(b) said flange having opposite ends,

(c) a reinforced corner flap member hingedly connected to each of said flange ends,

(d) said flap members being adhesively secured to a pair of opposite side walls of said sleeve other than said one side wall for anchoring said flange to permit insertion of said lifting blade between said flange and said one side wall.

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