Aug. 10, 1965 S. CONESCU 3,199,760

BOX CONSTRUCTION

Filed May 1, 1964 3 Sheets-Sheet 1

FIG. 1

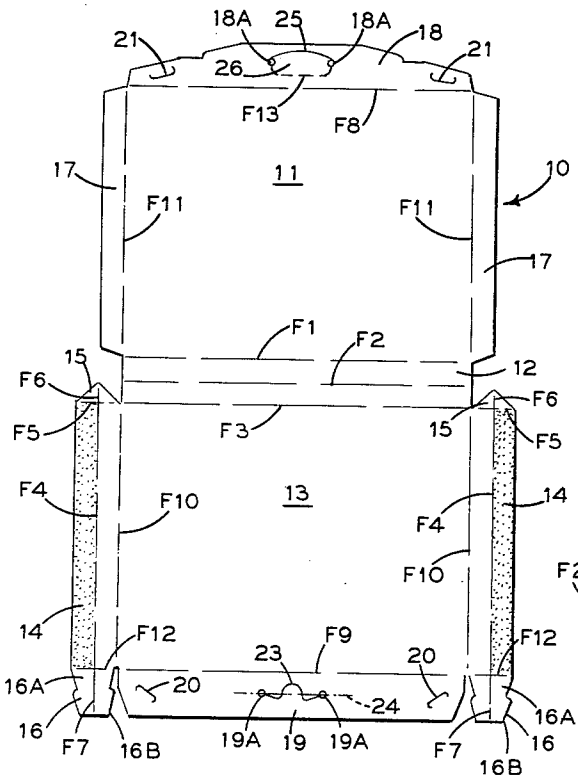


FIG. 9

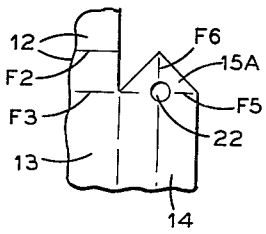


FIG. 4

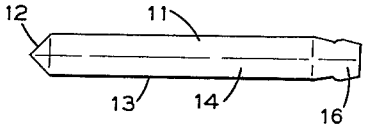


FIG. 3

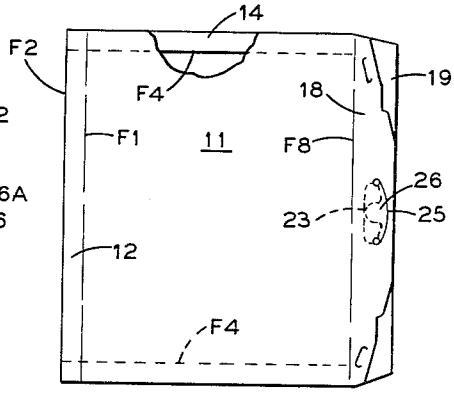


FIG. 6

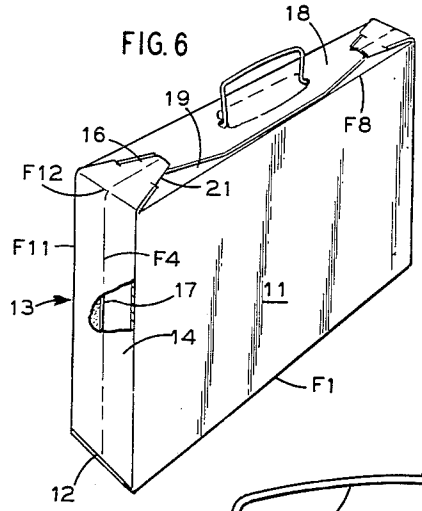


FIG. 7

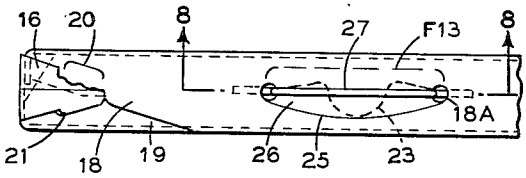
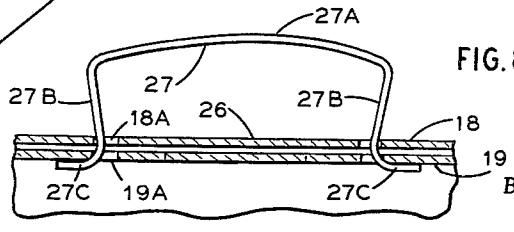


FIG. 8



INVENTOR.
Sidney Conescu
BY
Irving Feldman
ATTORNEY

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BOX CONSTRUCTION

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FIG. 2

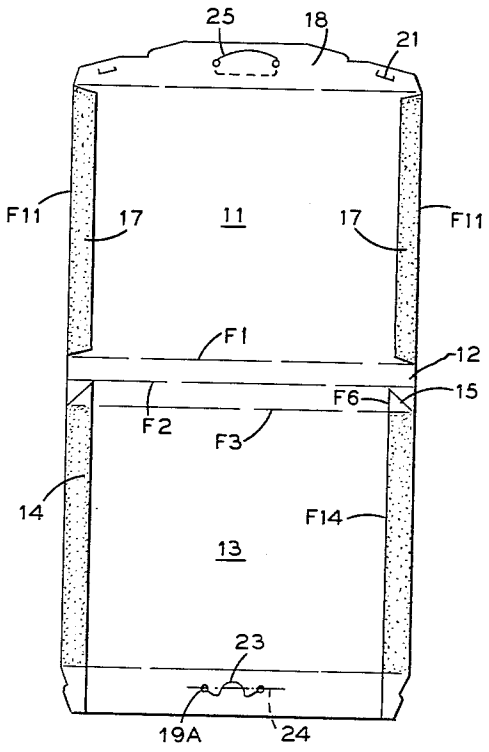
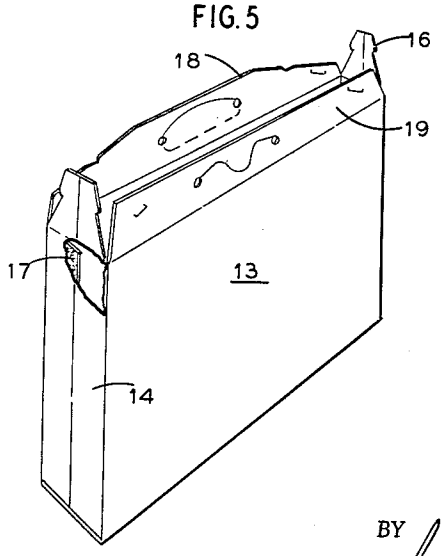


FIG. 5



INVENTOR.
Sidney Conescu
BY Irving Seidman
ATTORNEY

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BOX CONSTRUCTION

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FIG.10

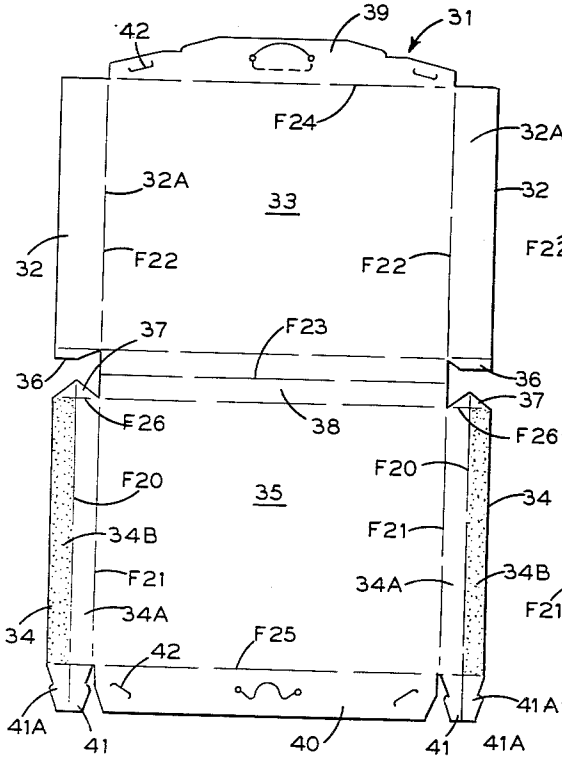


FIG.11

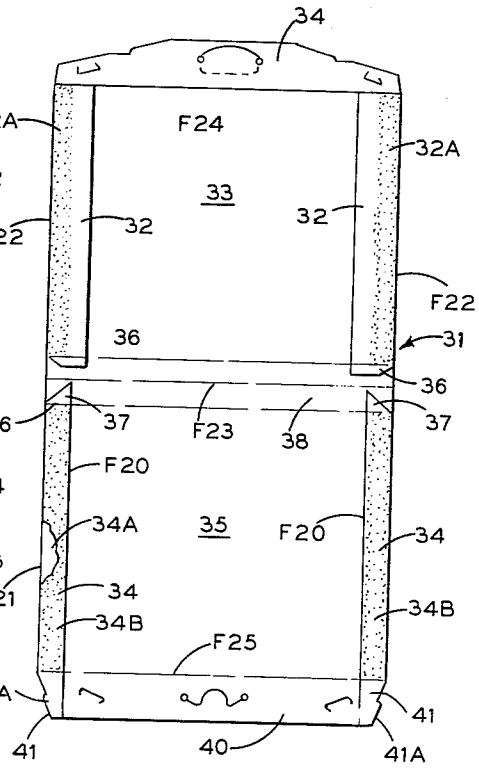


FIG.12

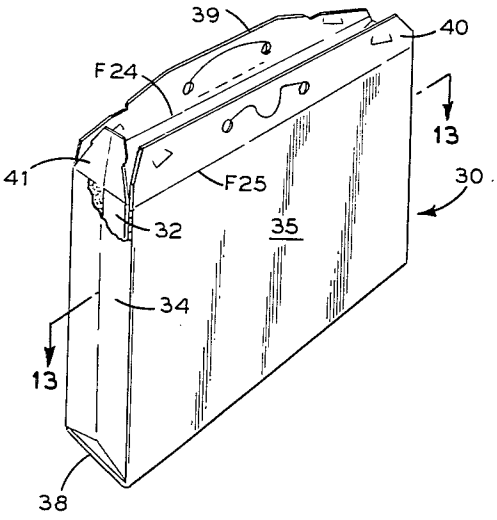
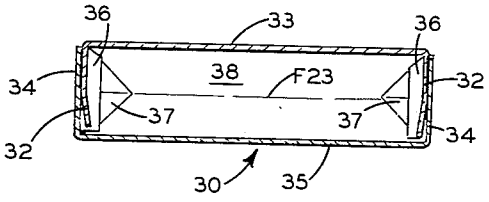


FIG.13



INVENTOR.

Sidney Conescu

BY Irving Feldman

ATTORNEY

United States Patent Office 3,199,760 Patented Aug. 10, 1965

3,199,760

BOX CONSTRUCTION

Sidney Conescu, 188 Beach 147th St., Neponsit, Long Island, N.Y.

Filed May 1, 1964, Ser. No. 364,076
3 Claims. (Cl. 229—16)

This invention relates in general to a box construction, and more specifically to a folding box which is adapted to be folded between a collapsed flattened position and an erected position.

An object of this invention is to provide a relatively simple and inexpensive box construction which can be readily formed from a single sheet of readily foldable sheet material.

Another object of this invention is to provide a folding box construction which is opened at one end thereof and which is constructed and arranged so that it can be readily knocked down to a collapsed flattened position.

Another object of this invention is to provide a readily collapsible box constructed and arranged with closure end flaps and improved interlocking means for releasably locking the closure flaps in the erected position thereof.

Another object of this invention is to provide an open end box construction with improved closure means and a handle therefor to facilitate carrying the same.

Still another object of this invention is to provide a folding box construction having novel construction details for facilitating and enhancing the folding of the box between the collapsed and erected position thereof.

It is another object of this invention to provide an open end box construction having the connected side and bottom wall portions therof formed with a medially extending foldline for enhancing the collapsing of the box in flattened position thereof.

The above objects and other features and advantages are attained by a folding box construction formed of a single blank of sheet foldable material having a plurality of transversely extending foldlines defining substantially equal size front and back panels and a bottom wall interconnected therebetween. The side walls of the box are defined by flaps which are hingedly connected to the opposed side edge portions of one of the panels. The side edge portions of the other panel have hingedly connected thereto coextensive side flaps. Connected to the remote end portion of the respective front and back panels are top forming flaps which cooperate to define in the operative position of the box a closure for the open end of the box. In accordance with this invention the respective bottom wall and opposed side wall portions of the box are each provided with a medially extending foldline so that the box in the collapsed position is folded into a substantially flattened position wherein the respective front and back panels are disposed in contiguous overlying relationship.

One end of the respective side walls has hingedly connected thereto about a transversely extending foldline a corner flap which in the erected position of the box is adapted to be disposed contiguous the bottom wall of the box. Connected to the other end of the respective side panels about a transversely extending foldline is a novel locking tab construction which is adapted to cooperate with complementary die cut slits formed in the adjacent corner portions of the top forming flaps. Accordingly the locking tabs are each provided with a longitudinally extending foldline that forms an extension of the medial foldline of the respective side walls, the fold of the respective tabs insuring a positive locking action with the respective complementary die cut slits formed in the top forming flaps in the folded position of the box.

The respective top forming flaps are also provided

with means for receiving a retractable handle to facilitate carrying of the box.

In a modified construction, means are provided in the respective corner flaps to minimize the stresses formed thereat when the box is folded in its collapsed position.

Therefore, a feature of this invention resides in the provision of a folding box construction which can be readily set up between a collapsed flattened position and an erected position.

Another feature of this invention resides in the provision that the box construction is readily collapsed with a minimum of effort so as to occupy a minimum of space when not in use.

Another feature resides in the provision of providing a readily retractable handle means which can be extended between a protracted and retracted position.

Another feature of this invention resides in a unique forming means formed in the closure flaps for preventing the retractable handle means from becomming lost or separated therefrom unintentionally.

Another feature of this invention resides in the structure of complementary interlocking means for releasably securing the top forming flaps closed in the erected position of the box.

Another feature of this invention resides in the provision or means for relieving the stress of the corner forming flaps in the collapsed position of the box.

Other features and advantages will become more readily apparent when considered in view of the drawings and description in which,

FIGURE 1 is an expanded view of the foldable blank from which the box of the instant invention is formed.

FIGURE 2 is a plan view of the blank construction of FIG. 1 illustrated in an intermediate folded position.

FIGURE 3 is a plan view of the box construction shown in its collapsed folded position.

FIGURE 4 is an end view of the folded box of FIG. 3.

FIGURE 5 is a perspective view of the box construction illustrated in its erected, but open position.

FIGURE 6 is a perspective view of the box construction shown in its erected closed position.

FIGURE 7 is a plan view of the box top in the erected and closed position thereof.

FIGURE 8 is a fragmentary sectional elevation view taken along line 8—8 of FIG. 7.

FIGURE 9 is a fragmentary plan view of a modified blank construction.

FIGURE 10 is a plan view of an expanded blank construction for a modified box construction.

FIGURE 11 illustrates the blank of FIG. 10 in an intermediate folded position.

FIGURE 12 is a perspective view of an assembled box formed from the blank of FIG. 10.

FIGURE 13 is a sectional view taken along line 13—13 on FIG. 12.

Referring to the drawings, there is shown in FIG. 1 the expanded view of the blank 10 from which the box construction of the instant invention can be readily formed. The blank 10 of FIG. 1 may be formed of any suitable stock sheet material, as for example cardboard, paperboard and the like.

As shown, the blank 10 is provided with a plurality of transversely extending foldlines F1, F2, F3 for defining a front panel 11, a bottom wall panel 12, and a back panel 13 connected in and end to end relationship. More specifically, the front panel 11 is hingedly connected along foldline F1 to one edge of the bottom wall panel 12. The other edge portion of the bottom wall panel 12 is hingedly connected to the back panel 13 along a foldline F3.

In accordance with this invention, the bottom wall panel 12 is provided with a preformed crease line F2 which

extends parallel to the respective edge portions thereof along a medial line.

Connected to the opposed edge portions of the back panel are side wall panels 14. Each of the side panels 14 extend substantially coextensive the length of the back panel connected therebetween and each is provided with a longitudinal foldline F4 extending along the medial line thereof.

A corner flap 15 is connected about a transversely extending foldline F5 to the lower end of the respective side walls 14. In the illustrated embodiment of FIG. 1, the corner flap 15 is defined as a triangularly shaped member which is hingedly connected to its adjacent side wall panel 14 by means of a transversely extending foldline F5. The corner flaps 15 are each formed with the preformed crease line or foldline F6 to facilitate flexing of the same.

The other end of the side wall panels 14 has hingedly connected thereto a locking tab 16 which is also creased at F7 longitudinally thereof by an extention of the longitudinally extending foldline F4. As shown, the locking tab 16 is provided with an inwardly tapering body portion 16A which connects to a head portion 16B to define a wing shaped tab structure.

Connected to the side edge portions of the front panel 11 are a pair of coextensive side flaps 17. In the folded position of the box, the side flaps 17 will overly portions of the side wall panels whereby they are secured together, e.g. by suitable adhesive means.

Completing the box construction are a pair of top forming flaps 18, 19. One of the top forming flaps 18 is connected along a foldline F8 to one remote edge portion of the front panel 11 and the other top forming flap 19 is connected to the other remote edge portion of the back panel along foldline F9. As seen in FIGS. 5 through 7, the respective top forming flaps 18, 19 in the folded position of the box are adapted to be disposed in overlapping relationship with one another.

In accordance with this invention, the underlying flap 19 of top forming flaps is rendered substantially rectangular in outline and it has formed in opposed corner portions adjacent its respective foldline substantially U shaped or C shaped die cut slit 20 disposed on a bias with respect to the flap construction. The overlying top forming flap 18 is provided with cut-a-way corner portions so that in the folded position of the top flaps, the C shaped slits or die cut 20 formed in the corners of the underlying top forming flap 19 will be exposed. The overlying top forming flap 18 is also provided with oppositely disposed substantially C shaped or U shaped die cuts 21 or slits to complement the die cut slits 20 formed in the other top forming flap 19. The arrangement is such that in the folded position of the respective top forming flaps 18, 19, the die auts 20, 21 formed therein are readily exposed, as noted in FIG. 7.

To form the blank construction of FIG. 1 into the box, it will be noted, as best seen in FIG. 2, that the side panels 14 are reversely folded along the foldline F4 and then folded along foldline F10 to overlie the back panel 13. Because of the longitudinally extending preformed crease line F4 extending along the side wall panel 14, the corner flaps 15 and connected tab 16 are likewise reversely folded as shown in FIG. 2. The side flaps 17 of panel 11 are likewise folded along foldlines F11 to overlie the panel 11. The front panel 11 is then reversely folded about the medial crease line F2 of the bottom panel 12 so that the front 11 is disposed into overlapping relationship with the back 13 as seen in FIG. 2. The respective side flaps 17 and side panels are thus disposed in overlying relationship and secured, e.g. by adhesive or the like in a folded position, as shown in FIG. 3. Thus, to erect the box from its collapsed and formed position of FIG. 3, all that is required is for the bottom wall 12 to be folded flat, thereby causing the respective side wall panels 14 to unfold. This action causes the side wall panels 14 to expand to a position shown in FIGS. 5 and 6.

The respective top forming flaps 18, 19 are then folded along their respective hinge or foldlines F8, F9 so that they are disposed into overlapping relationship to form a closure for the only open end of the box. With the top forming flaps 18, 19 folded in overlapping relationship, the locking tabs 16 are folded along their transversely extending foldlines F12 so that the wing portion 16B thereof are inserted into the opposed C shaped die splits 20, 21 formed in the adjacent corner portions of the top forming flaps 18, 19. Because of the preformed crease line F7 formed along the tabs 16 flexes the tab in a manner that it will be positively maintained in locking relationship with its respective complementary die cut slits 20, 21 when the box is folded and sealed.

In one form of the invention, as in FIG. 9, similar in all respects to the box of FIGS. 1 to 8 except that an aperture 22 may be formed at the intersection of the foldlines F5 and F6 about which the corner flap 15A folds in the respective erected and collapsed position of the box. Because of the aperture 22 at this position, the stresses formed at the intersection corner flap 15A folds in the erected position of the box are relieved thus enhancing the erecting and collapsing of the box.

Means are provided for facilitating the carrying of the box in the erected position thereof. In accordance with this invention, the top forming flaps 18, 19 are each provided with a pair of spaced apart aligned openings 18A, 19A. The openings 19A formed on the under top forming flap 19 are interconnected by an irregular continuously shaped die cut 23 which has portions thereof extending to either side of a center line 24 extending between the respective apertures 19A. The overlying top forming flap 18 is provided with a die cut line 25 which is extended between the apertures 18A formed therein to define a flap 26 hingedly connected along an opposed foldline F13. The handle means comprises a bail member 27 having an arcuate or curved portion 27A with connected opposed leg portions 27B that terminate in laterally bent, outwardly extending end portions 27C. As shown in FIG. 8, the opposed leg portions 27B of the handle 27 are extended through the aligned apertures 18A, 19A formed in the respective top forming flaps 18, 19 with the end portions thereof extending outwardly of the apertures. Thus, the arrangement is such that the handle 27 can be readily extended betwen a protracted and retracted position, as best seen in FIG. 8. In the retracted position, it is to be noted that because of the irregular shape of the die cut 23 formed in the under panel 19 that the arcuate portion 27A of the handle is prohibited from going through the top forming flaps 19 and inwardly of the box.

To retract the handle, the hinge flap 26 normally disposed in the overlying relationship with the handle to conceal the same in the inoperative position is folded relative to its foldline F13 so the arcuate portion 27A of the handle 27 may be extended through the cut-out defined by the handle flap 26. With the handle 27 extended through the opening defined by the flap 26 formed in the upper top forming flap 18, the hinge handle flap 26 can then be folded back into the plane of its respective top forming flap 18 so that the arcuate portion of the handle is spaced above the hinge flap 26, as in FIG. 8, and the handle 27 is rendered fixed in its protracted position.

FIGS. 10 through 13 illustrate a modified form of the invention. In this form, the box construction 30 and the blank 31 from which it is formed is identical to that herein described with reference to FIGS. 1 through 9 with the exception that the side flaps 32 connected to the opposed side portion of the front panel 33 have been modified as herein described.

Referring more specifically to FIGS. 10 to 13, it is to be noted that the side flaps 32 connected to the front panel 33 are formed so as to have a width substantially equal to the width of the side wall panels 34 connected to the opposed side edges of the back panel 35. Also, each of the respective side flaps 32 connected to the front panel

33 are provided with hingedly connected corner flaps 36 at the bottom thereof, which in the folded position of the box are arranged to overlie the corner flaps 37 of the side wall panels. Thus in the assembled position of the box 30, the arrangement is such that the sides of the box will be formed with a double thickness inasmuch as the side wall flaps 32 of the front panel 33 overlie the side wall panels 34 of the back panel 35.

To form the blank construction of FIG. 10 into the assembled box position, the side wall panels 34 connected to the opposed side edges of the back panel 35 are reversely folded along their respective intermediate foldlines F20 and then folded along its hingedly connected foldline F21 to overlie the back panel 35, as shown in FIG. 11, and as hereinbefore described with respect to the box construction of FIGS. 1 to 9. The side flaps 32 connected to the opposed side portions of the front panel 33 are reversely folded about their hingedly connected foldline F22 so as to overlie the front panel 33, as shown in FIG. 11. It is to be noted that the entire area side flaps 32 connected to the front panel 33 overlie the front panel in the intermediate folded position of FIG. 11, whereas the side wall flaps 34 connected to the rear panel 35 are first reversely folded about their meidal foldline F20. Thus, only a longitudinal half portion 34A of the side wall panels 34 overlie the connected back panel. The other longitudinal half portion 34B overlies portion 34A in the folded position.

In accordance with this form of the invention, a coating of pressure sensitive adhesive is provided on the inside surface of portion 34B of the respective side wall panels 34. A longitudinal half portion 32A of the side flaps is also provided with a coating of suitable pressure-sensitive adhesive. Accordingly, half portions 32A of flaps 32 are coated on the outer surface of the blank 31. Thus, when the front panel 33 is folded along the medial foldline F23 of the bottom panel 38 to overlie the back panel 35, the complementary adhesively coated portions 34B of the side wall panels 34 are disposed into face to face contacting relationship with the adhesive coated portions 32A of the side flaps 32. Therefore, as best seen in FIG. 13, in the folded or erected position of the box, the complementary longitudinal half portions 32A and 34B of the side flaps 32 and the side panels 34 are adhesively secured.

Thus, to erect the box to a position shown by FIGS. 12 and 13 from its intermediate collapsed position, all that is required is for the bottom wall 38 to be folded flat, thereby causing the respective side wall panels 34 to unfold to a position indicated in FIGS. 12 and 13. Because only complementary half portions 32A and 34B of the respective associated side flaps 32 and side wall panels 34 are adhesively secured together, it will be noted that the side flaps 32 will unfold with the outer side wall flaps, as the box is expanded to its erected position.

The respective top folding flaps 39, 40 of the box construction of FIGS. 12 and 13 are then folded along their respective hinged or foldlines F24, F25 so that they are disposed into overlapping relationship to form a closure for the open end of the box, in a manner similar to that hereinbefore described with reference to FIGS. 1 to 9. Thus with the top forming flaps 39, 40 folded in overlapping relationship, the locking flaps 41 are folded along their reversely extending foldline so that the winged ends 41A thereof are inserted into the opposed die cut slits 42 formed in the adjacent corner portions of the respective top forming flaps 39, 40 in a manner similar to that previously described. Also, it is to be noted that in this form of the invention the means for facilitating the carrying of the box 30 is similar to that previously described, and therefore need not be repeated.

If desired, the corner flap 37 connected to the bottom of the outer side wall panels 34 may be provided with an aperture at the intersection of the foldlines F26 and F26 similar to that shown in FIG. 9 so as to minimize

the stresses formed thereat in the folded position of the box.

In the modified box construction of FIGS. 10 to 13, the auxiliary corner flaps 36 connected to the side flaps are arranged so that in the folded position of the box, they will overlie the corner flaps 37 of the outer side wall panels 34 in a manner indicated in FIG. 13. Thus in this arrangement, the corner flaps 36 will seal the aperture formed in the corner flaps 37 of the outer side panel 34.

In all other respects, the construction and operation of the box construction of FIGS. 10 to 13 is similar to that described with reference to FIGS. 1 to 9.

While the instant invention has been described with respect to the illustrated embodiments, it will be appreciated that variations and modifications thereof may be made without departing from the spirit or scope of the invention.

What is claimed is:

1. A folding box adapted to be folded between a collapsed and erected position comprising,
(a) a single sheet of blank material,
(b) said blank material having a plurality of foldline extending transversely of said blank to define a front panel, a back panel, and a bottom wall interconnected between adjacent lower edge portions of said front and back panels,
(c) said front and back panel being substantially equal in size,
(d) and said bottom wall having a preformed foldline extending longitudinally thereof along a medial line thereof,
(e) a side panel hingedly connected to each of the opposed sides of said front panel,
(f) each said side panels being longitudinally creased along a medial line thereof so as to be reversely folded inwardly between said front and back panel in the collapsed position of said blank,
(g) an imperforate triangularly shaped corner flap hingedly folded along its base to one end of each of said side panels,
(h) and a winged locking tab connected along a foldline to the other end of each of said side panels,
(i) a side flap connected along a foldline to the opposed sides of said back panel,
(j) said side flap being adapted to be folded inwardly onto said back panel in the collapsed position of said box,
(k) means for securing the side flaps to said side panel in the folded position of said blank,
(l) a top forming flap connected along a foldline to the upper edge of the respective front and back panels,
(m) the top forming flaps being adapted to be disposed in overlapping relationship in the folded position of said box,
(n) the overlying one of said top forming flaps having cut away corner portions, so as to expose the corner portions of the underlying top forming flap,
(o) said winged tab being adapted to be interlockingly received in said die cut slit of the respective overlying and underlying top forming panel in the erected position of the box,
(p) and a retractable handle forming means connected to the top forming flaps of said box.

2. A collapsible folding box adapted to be folded between a collapsed and erected position comprising,
(a) a single sheet of blank material,
(b) said blank material having a plurality of foldlines extending transversely of said blank to define a front panel, a back panel, and a bottom wall interconnected between adjacent lower edge portions of said front and back panels,
(c) said front and back panels being substantially equal in size and said bottom wall being relatively

narrow in width in comparison with said front and back panels,

(d) and said bottom wall having a preformed foldline extending longitudinally thereof whereby said bottom wall is adapted to be reversely folded outwardly in the collapsed position thereof along a medial line thereof,

(e) an outer side panel hingedly connected to the opposed sides of said front panel,

(f) and each of said outer side panels being longitudinally creased along a medial line thereof so as to be reversely folded inwardly between said front and back panel in the collapsed position of said box,

(g) a triangularly shaped corner flap hingedly folded along its base to one end of each of said outer side panels,

(h) a winged locking tab connected along a foldline to the other end of each of said outer side panels,

(i) an inner side panel connected along a foldline to the opposed sides of said back panel,

(j) said inner side panel equal in width to that of said outer side panel, said inner side panel being adapted to be folded inwardly onto said back panel in the collapsed position of said box,

(k) means for securing said inner side panel to said outer side panels in the folded position of said blank, said securing means including a pressure sensitive adhesive whereby said complementing surfaces of said inner and outer side panels are coated with said adhesive,

(l) a top forming flap connected along a foldline to the upper edge of the respective front and back panels,

(m) the top forming flaps being adapted to be disposed in overlapping relationship in the folded position of said box,

(n) the overlying one of said top forming flaps having cut away corner portions to expose the corner portion of the underlying flap in the erected position of said box, and said top forming tops having die-cut slits formed in the corner portions thereof,

(o) said winged tab being adapted to be interlockingly received in said die cut slit in the erected position of the box,

(p) and handle forming means connected to the top forming flaps of said box, said handle being mounted for movement between a retracted and protracted position.

3. The invention as defined in claim 2 wherein each of said inner side panels have hingedly connected thereto a corner flap adapted to be folded inwardly of said box in the assembled position.

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GEORGE O. RALSTON, *Primary Examiner.*

FRANKLIN T. GARRETT, *Examiner.*