

Feb. 2, 1960

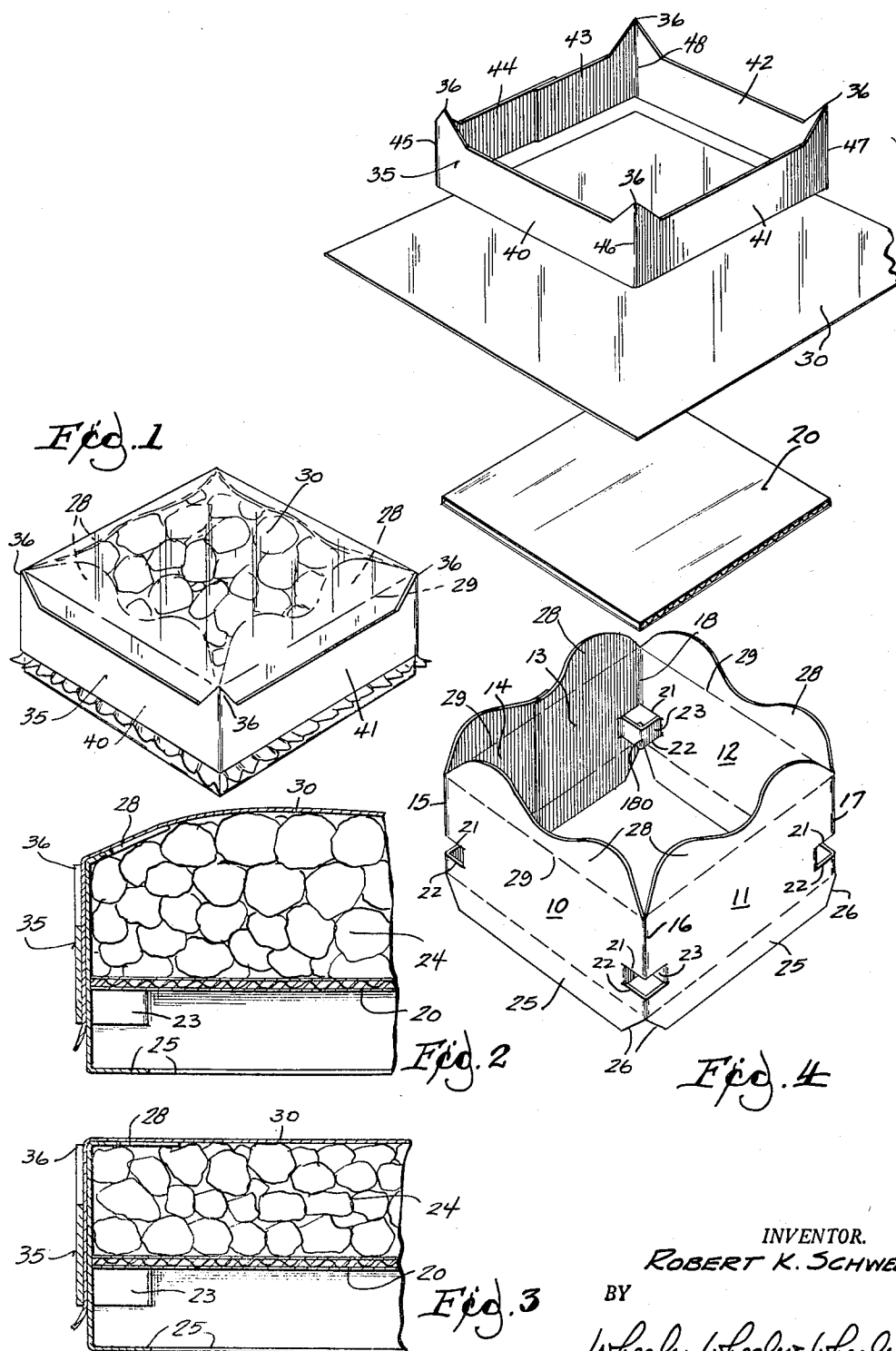
R. K. SCHWEBS

2,923,211

BOX AND METHOD AND APPARATUS FOR THE MANUFACTURE THEREOF

Filed Aug. 12, 1957

2 Sheets-Sheet 1



INVENTOR.
ROBERT K. SCHWEBS
 BY
Wheeler, Wheeler & Wheeler
 ATTORNEYS

Feb. 2, 1960

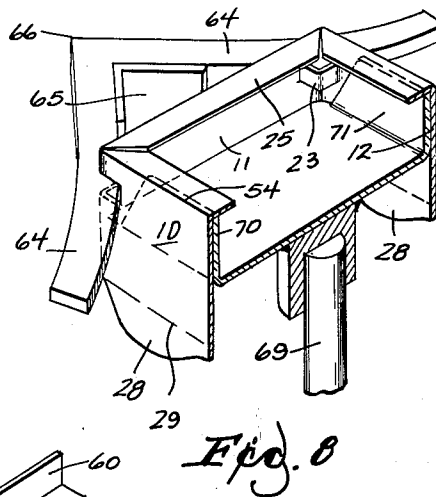
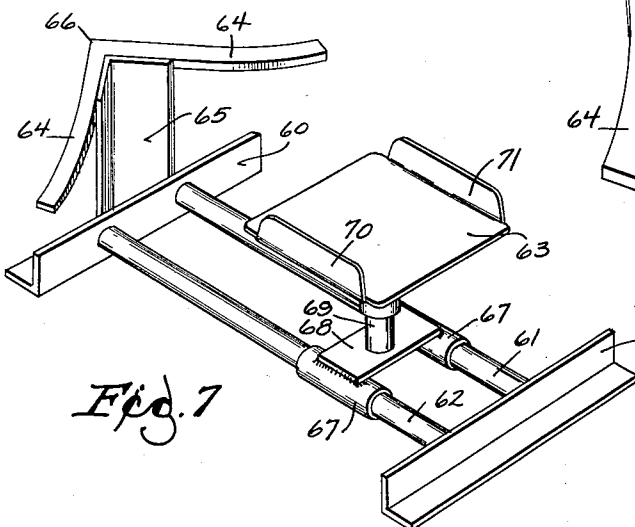
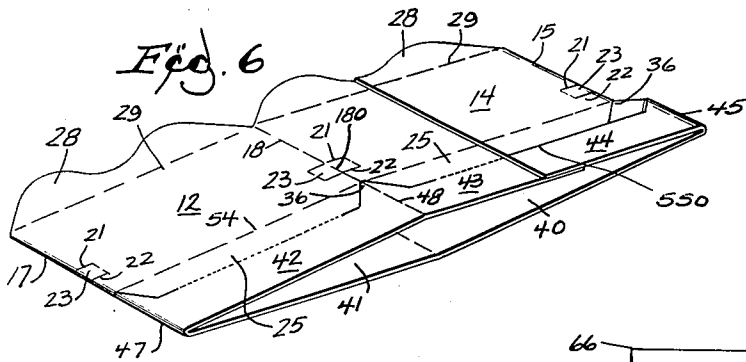
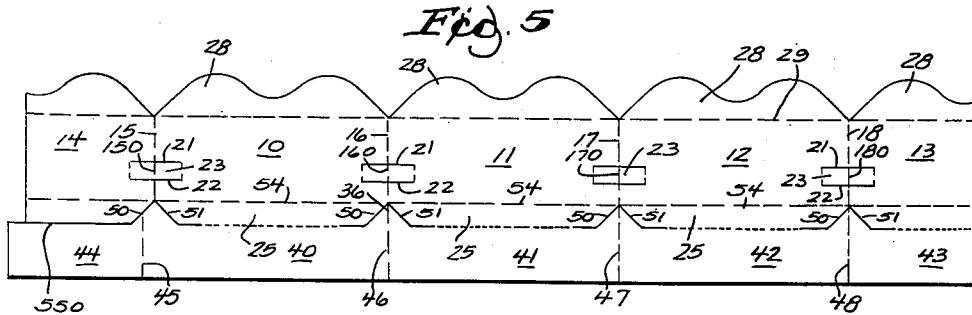
R. K. SCHWEBS

2,923,211

BOX AND METHOD AND APPARATUS FOR THE MANUFACTURE THEREOF

Filed Aug. 12, 1957

2 Sheets-Sheet 2



INVENTOR.
 ROBERT K. SCHWEBS
 BY
 Wheeler, Wheeler & Wheeler
 ATTORNEY

1

2,923,211

BOX AND METHOD AND APPARATUS FOR THE MANUFACTURE THEREOF

Robert Kent Schwibs, Appleton, Wis., assignor to Cornell Paperboard Products Co., Milwaukee, Wis., a corporation of Wisconsin

Application August 12, 1957, Serial No. 677,532

11 Claims. (Cl. 93—36)

This invention relates to a box for the merchandising of fruit and vegetables or the like and to a method and apparatus for the manufacture thereof.

Fundamentally the box comprises a band having its ends connected to provide a side wall of generally square or rectangular contour, each corner of the band being spanned by parallel slits to provide a strip which can be reversed as to angularity to project in the interior of the band for the support of a removable bottom. It has been found that the openings left by folding the corner strips into the box are desirable for the stated purpose in that they ventilate the fruit or vegetables in the box, which is otherwise quite tightly closed by the transparent film which spans its top as hereinafter described.

At its upper margin each side wall has a flexible and ornamental flap which is normally folded inwardly at right angles from the side walls of the box, adding greatly to its strength and rigidity. These flaps have the further function of cooperating with the cover film hereinafter described to tighten the contents of the box and to support the film without permitting it to be cut on the upper margins of the side walls. Further, these flaps are designed to provide supplemental support for the contents of the box and to give the box and its contents a finished appearance regardless of the amount of such contents within a variable range of capacities for which the box is designed. If its contents overfill the box proper, the ornamental flanges extend upwardly at an angle, whereas if the contents fill the box substantially flush with its upper rim, the flanges will be folded flat across the contents. In either case the package will appear finished.

Holding these ornamental flanges, and confining the contents of the box, as well as protecting them against handling by customers, is a transparent sheet which is held to the box by a clamping band telescopically engaged over the band which provides the side walls for the box. The clamping band is also of special design, desirably being higher at its corners than elsewhere, the height of the corners being determinative of the position of the clamping band on the side of the box, thereby contributing further to the finished appearance of the completed package.

In a desired method of construction, the strip of material which serves as a blank from which the box is formed is of sufficient length to provide all of the box sides in successive interconnected panels with sufficient material for overlap to permit the connection of the ends of the blank to form the box. Desirably the depth or width of the strip is sufficient so that the clamping band forms a part of the same original blank, portions severed from the clamping band intermediate the pointed corners thereof being used to provide bottom flaps for the portion of the blank which forms the box. In the preferred method of construction, the enter blank is scored to subdivide it into panels which are to form the box and the clamping band respectively and to provide a line of separation between the box panels and those forming the band. The ends of the blank are then connected to each other

2

so that both the box and the band are completed before they are separated from each other.

A jig is then used to deform inwardly the corner strips of the box which are to support the removable bottom. This jig comprises a pair of divergent camming fingers and a box blank support which includes flanges over which the bottom flanges of the box blank are engaged to locate the corner strips of the blank at the right level to be engaged by the fingers which are to deform them inwardly. That portion of the jig which supports the box is then moved toward the fingers until the fingers act to perform their function, whereupon the jig is withdrawn and moved to engage deforming fingers with the remaining two corner strips to form these inwardly. In a preferred embodiment, there are but two deforming fingers and the corner strips are engaged with these in pairs by rotating the jig and the box blank 180° after withdrawing the blank from the fingers following the first deforming operation and re-engaging the blank with the fingers to deform the remaining pair of strips.

In the drawings:

Fig. 1 is a view in perspective of a completed package made up through the use of a box embodying the invention.

Fig. 2 is a view on an enlarged scale fragmentarily illustrating in cross section the box and contents shown in Fig. 1.

Fig. 3 is a view similar to Fig. 2 showing how the box appears when it is not overfilled.

Fig. 4 is a view in perspective showing in mutually separated positions the component parts of the completed box.

Fig. 5 is a plan view of the blank from which the box and clamping strip are formed.

Fig. 6 is a view in perspective showing the connection of the ends of the blank to complete both the box and the clamping strip.

Fig. 7 is an enlarged view in perspective separately illustrating the jig used in reversing the fold of the corner strips of the box.

Fig. 8 fragmentarily illustrates the jig and a box in perspective.

The box comprises side wall panels 10, 11, and 12 and the lapping panels 13, 14 which are connected together in series, the lapping panels 13 and 14 being connected together adhesively or otherwise to complete a box wall in the form of a closed figure. Score lines at 15, 16, 17 and 18 define the corners of the box. While the finished box is desirably rectangular and usually square, the side walls do not in and of themselves give it this contour, the shape of the box being determined by holding the side walls in the desired relationship by the insertion of a bottom panel 20 usually made of corrugated board as shown in Fig. 4.

Parallel slits 21, 22 span the score lines 15, 16, 17 and 18 respectively defining corner strips 23 which, in the completed box shown in Figs. 2, 3 and 4, are reversed so that their respective fold lines 150, 160, 170 and 180 extend into the box, being reversely folded as compared with the box corners 15, 16, 17 and 18. In consequence of this arrangement, the respective corner strips 23 provide supports upon which the bottom panel 20 rests in the manner best shown in Figs. 2 and 3. The contents 24 of the box are placed upon the bottom panel 20 and confined within those panel portions 10, 11, 12, 13 and 14 which lie above the bottom panel.

The bottom margins of the several panels have flanges 25 which, in the completed box, are usually turned horizontally inwardly as shown in Figs. 2 and 3. To accommodate such inward folding, the flanges 25 have mitered terminal margins at 26.

The upper margins of the several box panels 10, 11,

12, 13 and 14 have decorative flanges 28 as clearly shown in Figs. 1, 4 and 6. Score lines 29 define the foldable connection between the flanges 28 and the respective side panels. When the box contents exceed in height the side wall panels above the bottom 20 as shown in Figs. 1 and 2, the decorative flanges 28 will be disposed at an upward inclination where they will provide supplemental support and assist the side panels in confining the contents. When the box contents fill the box only level full as shown in Fig. 3, the decorative flanges 28 will lie substantially horizontally across the contents as shown in Fig. 3.

In either case, the filled box has a transparent plastic film 30 applied over the contents and across the decorative flanges 28 and downwardly along the side panels. The band 35 is then telescoped over the margins of the film 30 to clamp these margins against the external surfaces of the panels 10, 11, 12, 13 and 14 to hold the film 30 snugly across the contents of the box and to hold the decorative flanges 28 snugly in position over the contents regardless of whether the box is just filled, as shown in Fig. 3, or is over-filled, as shown in Fig. 2. Since the cover film is applied under some tension across the box contents, it is important that support for it is provided by the flat external faces of the decorative flanges 28. Otherwise there would be a tendency for the film to be cut or torn across the upper margins of the side panels of the box either during application or during exposure for sale.

Inasmuch as the clamping band 35 is held in position only frictionally, it is desirable that it be located with some accuracy. At the desired intermediate level, there is no tendency for the band to be displaced in the handling of the box. Accordingly, this band has peaked corners at 36. When the band is telescoped downwardly over the box and film and the box contents, some or all of the peaks 36 will desirably be registered with the upper corners of the box, thus inherently locating the band at a uniform height on all sides of the box.

The filled boxes may be nested or stacked without damage to their contents due to the mating of the inclined top flanges and the inturned bottom flanges.

Like the box itself, the band comprises a number of panels 40, 41, 42, 43 and 44 connected on fold lines at 45, 46, 47 and 48 which register with the respective peaks 36, the lapping ends of panels 43, 44 being secured to each other by adhesive or otherwise.

In the preferred method of manufacture, the box panels and the clamping band panels are formed from the same blank as shown in Fig. 5. In forming this blank, the stock is completely severed on the lines 21, 22 which delineate the corner strips 23, and it is also completely severed on the lines 50, 51 which converge upwardly to form the peaks 36 registering with fold lines 15, 16, 17 and 18 of the box.

The peaks may also register with the transverse fold lines 46, 47, 48 of the band portion of the blank, but the fold line 45 of the band portion is desirably offset outwardly from the peak 36 which registers with the fold line 15 of the blank. The blank panel portion 44 of the blank is made slightly longer than the box panel portion 14 and these two panel portions 44 and 14 are completely severed from each other on the line 550. The purpose of this arrangement is to make it possible to fold and glue the ends of the blank in such a manner that the over-all dimensions of the band portion will slightly exceed the over-all dimensions of the box forming portion of the blank to enable the band to be telescoped over the box portion in the manner already described.

The blank is scored on the parallel lines 29 and 54 upon which the decorative flanges 28 and the bottom flanges 25 are to be folded, but the lines 55 between the box forming panel portions 10, 11, 12 and 13 and the band forming panel portions 40, 41, 42 and 43 respectively are perforated or more deeply scored so that after

the blank has been folded and the ends of the blank have been connected as shown in Fig. 6, the clamping band portion of the blank can be completely severed from the box portion thereof along the lines 55 to separate the band for manipulation as shown in Fig. 4. It will be observed that the cuts on lines 50, 51 of the blank not only form the peaked corners 36 of the band but also form the mitered edges 26 of the box flanges 25.

As a convenient means of reversing the fold 180 of each of the corner strips 23, I provide a jig as shown in Figs. 7 and 8. The base 60 comprises ways which may constitute the bars 61, 62 upon which the box-supporting member 63 is reciprocable to and from the converging forming fingers 64. These may be carried from the base by means of supports 65. Desirably the forming fingers have curvilinear outer ends so that their angle of convergence which is at first quite wide is narrowed as the fingers converge to an apex at 66.

It will be understood that the forming fingers may be duplicated at opposite ends of the base if desired. Since this involves mere duplication of the structure shown, it is not illustrated. It is found that by swiveling the box supporting jig, in addition to making it slidable along ways provided by the base, some space and expense can be saved by using only two fingers as illustrated, the operation being just as easy for the operator as if four fingers were provided. Therefore, the preferred arrangement is as follows.

Sleeves 67 slidable on the bars 61, 62 are connected by a plate 68 on which there is a post 69 to which the box support 63 is swiveled. The box support desirably conforms substantially in plan to the inside of the box band. Marginally the support 63 is provided with upstanding flanges at 70, 71. When the inverted box forming band is placed over the support 63 and its bottom flanges 25 are folded inwardly over flanges 70 and 71 of the support as shown in Fig. 7, the band will be held at a level such that the height of the partially severed strips 23 (Fig. 6) will register with the fingers 64. When the entire box support and the box mounted thereon is slid along the way provided by bars 61, 62 to engage the fingers 64 with the corner strips 23, the corner strips will be folded inwardly to the position shown in Fig. 7. Thereupon, assuming that there is but one set of fingers 64, the box will be rotated upon the post 69 to present the other pair of corner strips to the fingers 64, and the support will again be advanced toward the fingers to reverse the angle of the second pair of corner strips, thus completing the band to receive the removable bottom 20 as shown in Fig. 4.

Using a jig of this sort, the box received flat by the user can be erected as required for use, the corner strip folds reversed, the bottom inserted, the contents placed within the box, the transparent film 30 applied over the contents, and the band telescoped into clamping engagement with the film to complete the package, all in one continuous operation.

I claim:

1. A method of manufacture of box elements comprising providing a blank, scoring the blank to provide box band and clamping band portions having generally corresponding panels, and partially severing the blank upon a line of severance between the box band portion of the blank and the clamping band portion thereof.

2. The method recited in claim 1 in combination with the further steps of connecting corresponding ends of the box band portion and the clamping band portion of the blank and subsequently severing a completed box band and a completed clamping band from each other.

3. The method recited in claim 1 in combination with the further steps of providing parallel slits intersecting the scoring between panels of the box band portion of the blank to provide strips of stock across the scoring of the box band portion, connecting the ends of the box band portion to comprise a box wall having corners at which

5

panels are angularly related at the score lines and thereafter reversing the angles of the strips at the corners.

4. A method of manufacturing box elements of the character described, which method comprises providing a blank, transversely scoring the blank to provide panel portions hingedly connected in series, slitting the blank longitudinally across each of the transverse score lines to provide a corner strip, folding the panel portions upon the score lines to provide box corners, connecting the ends of the blank to each other to provide a closed box side wall band, and forcing each of said corner strips inwardly following the completion of the side wall band to reverse its angularity and to constitute each such strip as a support within the band.

5. The method recited in claim 4 in which at least 15 two such corner strips are forced inwardly concurrently.

6. A method of manufacture of box elements of the character described, which method comprises providing a blank constituting in one integral piece series-connected box side wall panels and clamping band side wall panels, 20 corner scoring the blank transversely to provide fold lines delineating said panels, scoring the blank longitudinally at opposite sides of the side wall panels to define flanges in hinged connection with the side wall panels, partially severing the blank between one set of side wall panel flanges and the clamping band panels aforesaid, providing parallel slits intersecting each of the transverse score lines of the blank intermediate the longitudinal score lines aforesaid to form inwardly foldable corner strips, connecting the ends of the blank to each other to constitute 30 the side wall panel portions and the clamping band panel portions as closed bands while such portions are still at least partially connected, thereafter severing the blank between the clamping band portions and the side wall portions, and forcing the corner strips inwardly of the side wall band.

7. The method recited in claim 6 in combination with assembly steps of inserting a bottom panel upon the inwardly folded corner strips of the side wall band, applying a cover film across the side wall band and upon the inwardly folded top marginal flanges thereof, and applying the clamping band telescopically over the cover film and the side wall band to hold the cover film to the side wall band.

8. A method of manufacture and assembly of a box 45

6

having corner folds defining side panels and having horizontal slits across said folds defining reversible corner strips, which method comprises providing a blank constituting integrally connected box side wall panels, transversely scoring the blank to define the corner folds outlining said panels, slitting the blank on spaced lines intersecting respective corner folds to define the corner strips, connecting the end walls of the blank to constitute the blank a closed band, opening said blank to dispose 10 the contiguous panels thereof angularly with respect to each other and pushing one of said corner strips inwardly respecting the contiguous panels of the blank whereby to reverse its angularity with reference to the corner fold across which it extends.

9. The method of claim 8 in which said pushing step is performed by moving the blank bodily against a fixed member at the level of a corner strip to reverse the angularity of the corner strip and dispose the corner strip within the box.

10. The method recited in claim 9 including the further step of indexing the blank to present a different corner strip to said member and again moving the blank bodily toward said member to reverse the angularity of the last mentioned corner strip.

11. The method recited in claim 9 followed by the further step of moving another portion of the blank toward such a member to engage its corner strip therewith and to effect reversal of angularity of the last mentioned corner strip.

References Cited in the file of this patent

UNITED STATES PATENTS

1,509,921	Beaton	Sept. 30, 1924
1,898,208	Olsen	Feb. 21, 1933
1,956,819	Atkins	May 1, 1934
1,994,803	Atkins	Mar. 19, 1935
2,147,134	Addis	Feb. 14, 1939
2,211,488	Bergstein	Aug. 13, 1940
2,236,664	Arneson	Apr. 1, 1941
2,363,425	Klein	Nov. 21, 1944
2,573,393	Bousquet	Oct. 30, 1951
2,692,077	Kuhlman	Oct. 19, 1954
2,728,274	Nitchie	Dec. 27, 1955
2,848,016	Murphy et al.	Aug. 19, 1958