

April 16, 1940.

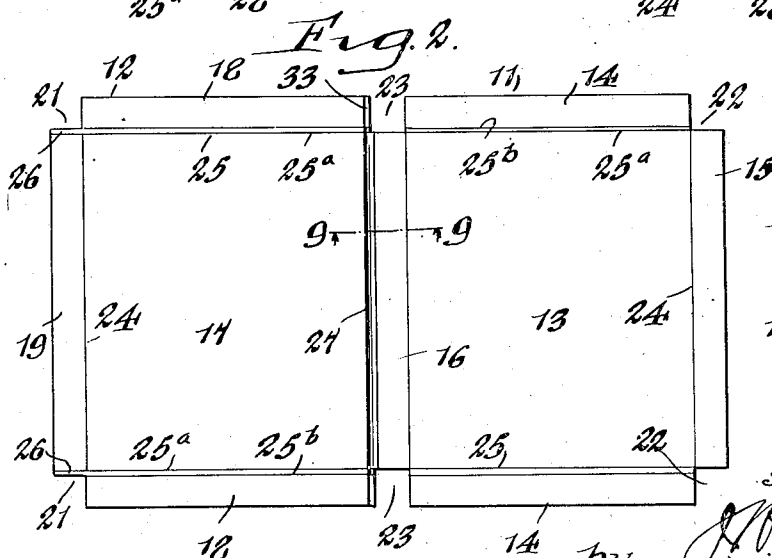
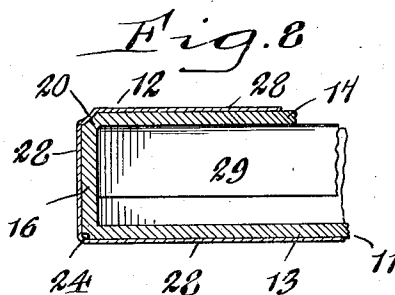
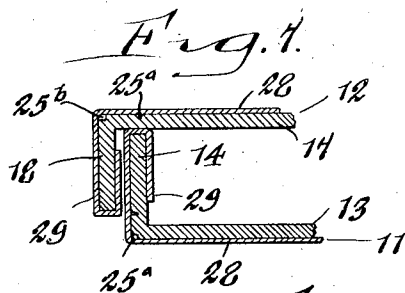
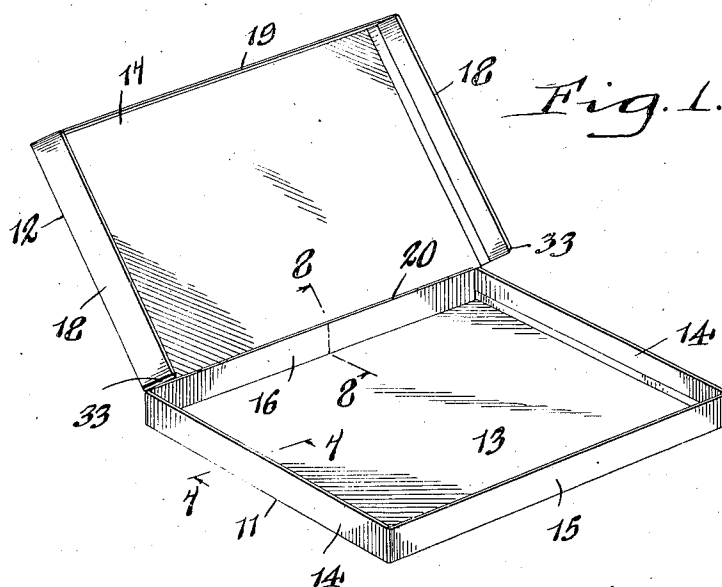
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2,197,152

BOX

Filed June 8, 1936

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

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BOX

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3 Sheets-Sheet 3

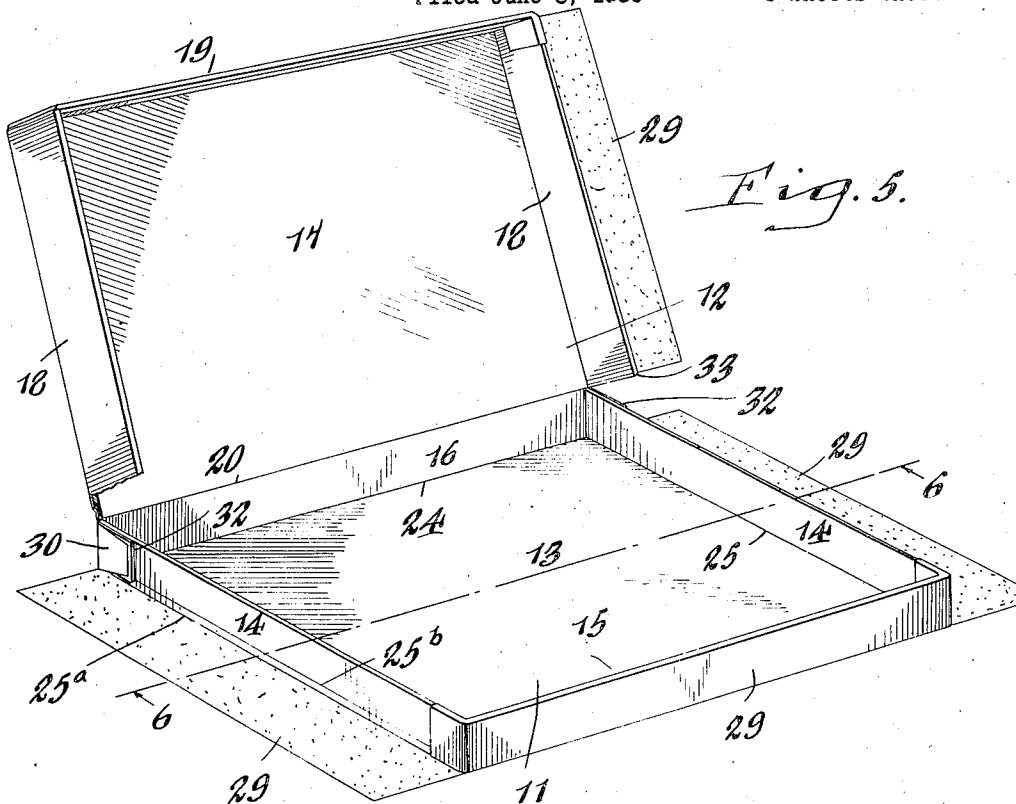
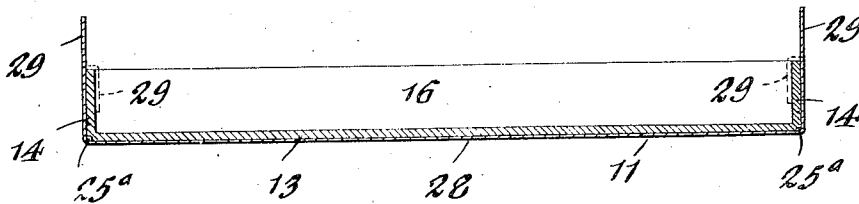


Fig. 6.



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UNITED STATES PATENT OFFICE

2,197,152

BOX

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Application June 8, 1936, Serial No. 84,143

13 Claims. (Cl. 228-6)

This invention relates to improvements in boxes or containers, and more particularly to such containers constructed of paper, cardboard, or similar sheet material.

It is a general object of the invention to provide an improved container of the class mentioned which can be constructed of a single integral blank or piece of material to provide the lid or cover, and the base or receiving part, and which may be expeditiously and economically manufactured largely by the use of automatic machinery.

Another object of the invention is to provide a container of the class mentioned with an improved hinge structure integral with the container blank and arranged so as to provide the requisite strength for supporting the lid or cover for swinging movements to and from closed position, and at the same time to provide for free, unobstructed movements of the lid and to avoid stiffness or resistance to such movements.

Still another object of the invention is to provide an improved blank, for constructing containers of the class mentioned, of a single integral piece of the material, and embodying an improved construction and arrangement whereby the side walls of the lid and base parts are offset slightly from each other so as to be assembled with each other in telescopic relation when the lid is closed.

A further object is to provide an improved arrangement of scoring or cuts in a container blank of the class mentioned, arranged so that the side walls may be formed by breaking down the material or deflecting it on either one or another of the scores, so as to dispose the walls in different planes.

A further object of the invention is to provide an improved method of constructing and forming a container of the class mentioned, from a single integral piece of material.

Other objects of the invention will be in part pointed out in the following detailed description of an illustrative but preferred embodiment of the invention, and it will be in part obvious in connection therewith.

The invention accordingly comprises the several steps and the relation and order of one or more of such steps with respect to each of the others, and the article possessing the features, properties, and the relation of elements, which are exemplified in the following detailed disclosure, and the scope of the application of which will be indicated in the claims.

For a more complete understanding of the

nature and objects of the invention reference is had to the following detailed description of the illustrative embodiment, and to the accompanying drawings in which:

Fig. 1 is a perspective view of a container or box embodying the features of the invention, the lid or cover being thrown back in open position;

Fig. 2 is a bottom plan or face view of a blank of cardboard or the like constructed in accordance with the invention;

Fig. 3 is an enlarged perspective view of a partially completed container showing a label or covering wrapper which is to be wrapped upon and attached to the outer surface of the container;

Fig. 4 is a top plan view of the container with the label partially applied thereto;

Fig. 5 is an enlarged perspective view of the container and label at a different stage of the construction;

Fig. 6 is a section substantially on the line 6-6 of Fig. 5 indicating a further stage of the construction;

Fig. 7 is a fragmentary enlarged sectional view taken substantially on the line 7-7 of Fig. 1 with the lid in closed position;

Fig. 8 is a fragmentary enlarged section substantially on the line 8-8 of Fig. 1; and

Fig. 9 is an enlarged detail section taken on the line 9-9 of Fig. 2.

Referring to the drawings for a detailed description of the embodiment of the invention shown, it may be noted that the body or framework of the complete box or container as shown in Fig. 1 is constructed of a single integral blank or piece of material. This blank may be constructed of any of the preferred materials used in making this type of box, such as cardboard, pasteboard, pressboard, bristolboard, fiberboard, and the like. This integral blank after being shaped to provide the bottom, top and side walls of the box, is covered with a finishing label or wrapper which is adhesively or otherwise attached to the surfaces of the formed blank.

The container comprises a bottom or base part 11, and a cover or lid part 12. The base part includes the bottom 13, side walls 14, a front wall 15, and a back wall 16, while the cover or lid part includes the top 17, side walls 18, and a front wall 19. The lid part of the box is joined by an integral hinge 20 to the back wall 16 so as to swing between opened and closed positions. While the container herewith disclosed is shown as being rectangular in plan, it will be under-

stood that it may be made in different shapes, such as triangular, square, hexagonal or of other polygonal shapes in plan.

According to the invention a blank of paste-board or similar material is provided as shown in Fig. 2, being of sufficient size to make the container complete with top and bottom and side walls thereof. This blank is integral throughout and is provided with cut-out areas 21 at the outer edge of the cover part 12 and with similar cut-out areas 22 at the corners of the base part 11. Also similar cut-out areas 23 are provided intermediate the ends of the blank and directly opposite to the ends of the intermediate wall section or back wall 16 of the blank and between the side walls 14 of the base section and the side walls 18 of the lid section. These cut-out areas provide for the fitting together of the wall sections of the blank at the corners of the base and lid parts thereof.

The container blank is provided with weakening or score lines 24 extending along the inner edges or bases of the wall sections 15, 16 and 19. These score lines are preferably formed by scores or incisions extending only part way through the material of the blank so as to weaken it to bending or deflecting of the material, thus providing for breaking down or deflecting the wall sections from the blank to position them in their upright or angular position with reference to the top and bottom of the container as shown in Fig. 1.

Plural score lines 25 are formed along the inner edges of bases of the side wall sections 14 and 18 of the base and lid parts of the container, and continue across both the base and lid parts of the blank. The score lines 25 are also provided by scoring or slitting the blank material as in the case of the score lines 24. In the embodiment shown each score line 25 is formed by two parallel incisions, 25a and 25b, spaced a short distance apart, the purpose of which will be later fully brought out. Also the score lines 25 at the opposite sides of the blank are parallel to each other throughout their extent. These score lines 25 provide for the breaking down or deflecting of the side walls 14 and 18 of the container. The score lines 24 and 25 are preferably formed by cutting the material by means of a sharp cutting edge but without removing any of the material.

It will be noted that the corner cut-out areas 21 of the cover part terminate at their inner edges in line with the outer scores 25b of the double score lines 25, while the cut-out areas 22 and 23 terminate at the inner edges in line with the inner scores 25a of said double score lines. In other words, the cut-out areas 22 and 23 are deeper than cut-out areas 21 by the distance or spacing of the scores of double score lines 25. This arrangement of the score lines and the cut-out areas 21 provides small scored sections 26 at the opposite ends of the front wall 19 of the lid which form a permanent part of this wall.

In order to provide for the integral hinge 20 between the lid and base sections of the box, an open channel or groove 27 is formed in the blank along the line of juncture of the back wall 16 and the top 17 of the cover part as shown in Figs. 2, 8, and 9. This channel or groove is formed in the surface of the blank which lies at the outside of the completed box. While the groove 27 may be formed by cutting out a part of the material or otherwise removing said material, it is preferable both from the standpoint of forming the groove of the requisite size and depth and from the standpoint of manufacturing economy, to

form the groove by a grinding or abrading operation as by using a grinding stone, emery wheel, or similar abrading implement. By this means the groove can be very readily constructed of the appropriate width and depth, and the depth of the groove with reference to the material thickness can be easily gauged. The groove is formed in the material along the line of flexure of the hinge, while it is made of sufficient width or amplitude so that the lid part of the box can move freely between its closed and fully opened positions without any objectionable binding or stiffness in said movements. With this hinge structure, the lid can move into fully opened position through an angle of 180°, or even through a greater angle without experiencing binding or appreciable resistance to the opening movement. Also when the cover is in open or in closed position there is very little tendency to move or snap back out of such open or closed position, as is the case in prior structures of this nature due to placing of the elastic material fibers under stress.

In order to reinforce the hinge 20 to strengthen it without impairing its flexibility or freedom of movement, a reinforcing strip 28 of paper or similar material is secured in position bridging or extending across the groove 27 as shown in detail in Fig. 8. In the embodiment shown this reinforcing strip is formed by the wrapper or label which is adhesively attached to the outer surface of the container, but it will be understood that a separate reinforcing strip may be provided for this purpose. The reinforcement as shown extends throughout the length and breadth of the groove 27 being adhesively attached to the groove surface and similarly attached to the container as referred to below. This reinforcement strengthens the hinge but due to its character and arrangement does not interfere with its flexibility or freedom of movement.

Referring to Figs. 3, 4 and 5, a wrapper, label or finishing strip 28 is shown as being constructed of a single integral material such as paper. This wrapper may be appropriately decorated and of ornamental character and bear printed matter on its outer surface, and be otherwise arranged to present an attractive and finished appearance of the outer surface of the container. The wrapper 28 is provided with sections or extensions 29 to overlap and cover the walls of the container, and to extend over the edges thereof onto the inner surfaces as seen in Figs. 1, 5 and 7. Also the wrapper is formed with tabs or extensions 30 formed by appropriate slits 31 so as to provide reinforcements or stays for the corners of the container where the end and side walls meet. Also, additional stay strips 32 may be provided for reinforcing the container at the corners thereof. These stays 32 may be made of paper, metal, or other appropriate material and adhesively or otherwise attached to the surfaces of the walls at the corners, or they may be formed by concealed wire stitches extending through the material at the corners and spanning the joints or meeting line of the walls at said corners. Also a separate stay-strip wrapped around the four walls may be used for this purpose. However, it is often desirable to make the material of the wrapper 28 of sufficient strength to provide the requisite corner stays without supplementing them by means of the stays 32 in which case the stays 32 may be omitted.

In order to taper off the inner ends of the side walls 18 as indicated at 33, the hinge groove 27

may be extended across these walls. This structure may be very conveniently effected at the same operation which forms the hinge groove. The taper 33 when the lid is in closed position is adjacent to the back wall 16, and the inclination of the taper is inwardly toward the back wall of the box thus forming a smooth finished appearance at this point and avoiding objectionable and unsightly protruding edges. When the wrapper or cover strip is applied it will extend over this tapered portion to the extreme edge of the side walls so as to enhance the appearance.

After the integral blank shown in Fig. 2 has been prepared by forming the score lines 24 and 25, and the cut-out areas 21, 22 and 23, and by forming the hinge groove 27 as above described, it is in condition to be formed to complete the box. This formation may be performed either by hand or by automatic machinery, and in either case the wall sections or parts 14, 15, 18 and 19 are turned or deflected along the respective score lines so as to assume substantial right-angular position with reference to the bottom 13 and top 17, deflection being away from the score lines, or in other words, in such direction that the scores are disposed at the outside of the box. In thus deflecting the side wall section 14 of the base part 11, pressure is exerted thereon so as to cause these wall sections to be bent at the inner scores 25a of the plural score line 25. Also the side wall sections 18 of the cover part 12 are caused to be deflected or bent upon the outer scores 25b of the multiple score line. In this manner it will be seen that the walls 18 of the cover part are offset or spaced outwardly slightly with reference to the walls 14 of the base part. This displacement is sufficient to position the walls 18 so that they will telescope outside of the walls 14 when the lid is moved into closed position as clearly shown in Fig. 7. The spacing of the scores or incisions 25a and 25b will be just sufficient so that the walls of the lid and base will inter-engage closely with each other; this spacing therefore may vary somewhat with different classes of stock in the blank. The other wall sections 15, 16, and 19 will be deflected in a similar manner upon the score lines provided therefor.

Due to the arrangement described, the walls 14, 15, and 16 of the base part will ordinarily be slightly higher than are the walls 18 and 19 of the lid part. Also it will be noticed that the upper edges of the walls 14, 15 and 16 will be at the same height or substantially flush with each other, and also that the walls engage smoothly to form the corner joints. Similarly the walls 18 and 19 will engage smoothly to form the corner joints of the lid part of the box, but it will be noticed that the small scored sections 26 will be included in these corner joints of the lid.

When the wall sections have thus been turned or deflected into their normal positions as shown in Fig. 3, the corner stays 32 will ordinarily then be applied by adhesively attaching them in position. The intermediate or back wall section 16 will thus be stayed in its normal upright position as well as the marginal wall sections 14, 15, 18 and 19. In case the corner stays 32 are not utilized, but reliance made upon the tabs 30 of the wrapper for staying the corners, a slightly different procedure of forming the container and applying the wrapper may be followed.

In cases where the stays 32 are used, the

wrapper will be adhesively applied to cover the outer surfaces of the container. For such application, the wrapper will ordinarily be coated with an adhesive and pressed into adhesive contact with the outer surface of the container. The wrapper extensions 29 for the walls 15 and 19 and for the intermediate wrapper extension 28a for the intermediate or back wall 16, will be pressed into adhering contact with their respective walls, and the stay tabs 30 will be folded around the respective corners and affixed thereto by pressing them into adhesive contact. Also the extensions 29 will be turned over the upper edges of the walls and pressed into adhesive contact with the edges and inner surfaces of sheet walls. If desired, the upper edges of the stay tabs 30 projecting above the container walls may be removed to facilitate folding and affixing the extensions and tabs. The wrapper extensions 29 for the walls 14 and 18 will then be pressed into adhesive contact with the outer surfaces of the walls, turned over the upper edges thereof and adhesively attached to the inner surfaces thereof as shown in Figs. 5 and 6 and as described in connection with attachment of the extensions 29 for the walls 15 and 19. A smooth finished appearance is thus presented by all exterior parts of the container and by both the base and lid sections thereof, and the corners of both the base and lid parts will be securely stayed in position.

Due to the fact that the double score lines 25 and the individual scores 25a and 25b thereof are parallel with each other, the telescoping walls of the base and lid parts will inter-fit in close relation with each other substantially throughout their extent, and there will be no appreciable gaps between the engaging walls at any part thereof. The appearance of the container and its closing function will thus be very much enhanced. The wrapper 28 functions to reinforce the container at the scored parts thereof where the walls are turned or deflected from the body part of the blank, and these parts of the container, especially those where the double score lines are formed, are maintained in correct position by virtue of this reinforcement.

Due to the broad open hinge channel 27 positioned at the outside of the juncture of the lid 12 and back wall 16 as described, provision is made for the cover or lid to swing into widely opened position without appreciable resistance by the hinge structure. When the lid has been thus opened there is very little tendency to spring back again toward its closed position. Also the wrapping strip 28 being secured in the hinge groove as described provides a reinforcement so as to prolong the life of the hinge. Because of the structure and arrangement of the hinge 20 at the juncture of the lid with the back wall 16 as described, said back wall may be, and ordinarily is, stayed firmly in upright position by means of the corner stays 32. This arrangement makes possible a "set-up" type of box with the back wall 16 secured in its normal upright position at all times whereby said wall protects and encloses the contents of the box, as well when the lid is in open position as when said lid is in closed position. Furthermore, by virtue of this improved hinge structure, the free-swinging movement of the lid between closed and fully opened positions is not impeded in any manner by this attaching of the back wall 16 in its upright position. It is to be understood, however, that the hinge struc-

ture described is capable of advantageous use independently of the permanently attached upright wall described. Also the improved structure and arrangement of the hinge 20 make possible the use of relatively firm or semi-rigid materials, even as hard as pressboard or fiberboard, in boxes of the "set-up" type, which are understood in the art to be boxes made of firm or semi-rigid materials, the parts of which are held in place after forming by means of wraps or other securing means. This type of box can be made advantageously by automatic machinery.

It is preferred to construct the entire integral blank of laminated paper stock as indicated diagrammatically in Fig. 9, the thin layers being attached together in any known manner, either by an adhesive or otherwise. With this laminated material the hinge groove 27 will extend through several layers or plies leaving several plies intact. In this manner the material at the groove 27 may be made quite thin so as to increase its flexibility while at the same time assuring adequate strength for supporting the lid.

It has been stated above that the box is preferably constructed of a single integral blank or piece of material; this, of course, refers to the fact that the framework or body of the box is made of a single integral blank. However, the invention, in some of its aspects, does not require that a single integral blank be utilized, but the framework of the box under some conditions may include two or more separate parts. The label or wrapper is a part separate from the integral blank, being adhesively applied to the formed box blank as described, but in some instances, this wrapper may be entirely omitted. Other modifications within the scope of the invention will be clear to those skilled in the art. Since certain changes in carrying out the above process, and certain modifications in the article which embody the invention may be made without departing from its scope, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a container, in combination, base and lid parts made of a single integral piece of sheet material, said base part having a wall part with which the lid part is integral, said sheet material being partly removed to provide a groove extending along one edge of the lid part and forming a flexible hinge upon which the lid part may swing between open and closed positions, said groove being positioned at the outside of the container substantially at the juncture of the lid part with said wall part, said wall part having corner stays attached thereto and to the container to secure said wall part in its normal upright position, and a flexible reinforcing strip for said hinge adhesively attached to the inner surface of said groove and extending across the latter, said reinforcing strip having integral parts overlying and secured to said corner stays.

2. A blank for making a container, said blank having lid and base parts and an intermediate wall part all integral with each other, said blank having parts of its material removed to form a groove positioned substantially at and extending along the juncture of said wall part with one of the other parts to form a hinge, said blank having cut-out areas at opposite sides thereof sub-

stantially in line with said wall part, and said groove extending along a margin of one or more of said cut-out areas.

3. A blank for making a container, said blank having lid and base parts and an intermediate wall part all integral with each other, said blank having parts of its material removed to form a groove positioned substantially at and extending along the juncture of said wall part with one of the other parts to form a hinge, said blank having cut-out areas at opposite sides thereof substantially in line with said wall part, said groove extending along a margin of one or more of said cut-out areas, and said blank having also corner cut-out areas of slightly less depth than said first-mentioned cut-out areas, said blank having a plural score line one score of which is substantially aligned with the inner edge of one of said cut-out areas, while another score of said plural score line is substantially aligned with the inner edge of another of said cut-out areas.

4. A blank for making a container, said blank having lid and base parts and an intermediate wall part all integral with each other, said blank having parts of its material removed to form a groove positioned substantially at and extending along the juncture of said wall part with one of the other parts to form a hinge, said blank having cut-out areas at opposite sides thereof substantially in line with said wall part, said groove extending along a margin of one or more of said cut-out areas, said blank having also corner cut-out areas of slightly less depth than said first mentioned cut-out areas, said blank having marginal side wall parts and having score lines to provide for deflecting the wall parts, certain of said score lines being plural and having two scores spaced apart a short distance.

5. A blank for making a container, said blank having lid and base parts and an intermediate wall part all integral with each other, said blank having parts of its material removed to form a groove positioned substantially at and extending along the juncture of said wall part with one of the other parts to form a hinge, said blank having cut-out areas at opposite sides thereof substantially in line with said wall part, said groove extending along a margin of one or more of said cut-out areas, said blank having also corner cut-out areas of slightly less depth than said first mentioned cut-out areas, said blank having marginal side wall parts and having score lines to provide for deflecting the wall parts, certain of said score lines being plural and having two scores spaced apart a short distance, one of the scores of said plural score line being substantially in line with the inner edge of said cut-out areas which are in line with said intermediate wall part, and another of said plural score line being substantially in line with the inner edge of said of said corner cut-out areas.

6. A blank for making a container, said blank having lid and base parts and an intermediate wall part all integral with each other, said blank having part of its material removed to form a groove positioned substantially at and extending along the juncture of said wall part with one of the other parts to form a hinge, said blank having marginal side wall parts and having score lines to provide for deflecting the wall parts, certain of said score lines being plural and having two scores spaced apart a short distance.

7. A blank for making a container, said blank having lid and base parts and an intermediate

5 wall part all integral with each other, said blank having part of its material removed to form a groove positioned substantially at and extending along the juncture of said wall part with one of the other parts to form a hinge, said blank having marginal side wall parts and having score lines to provide for deflecting the wall parts, certain of said score lines being plural and having two scores spaced apart a short distance, 10 said blank having corner cut-out areas positioned respectively at the ends of the side wall parts and being of different depths, one of the scores of said plural score line being substantially in line with the inner edge of one of said corner cut-out areas, and another of the scores of said plural score line being substantially in line with the inner edge of another of said corner cut-out areas.

8. A container blank having lid and base parts 20 and an intermediate wall part all integral with each other, said blank also having marginal wall parts and having score lines to provide for deflecting the wall parts, certain of said score lines being plural, extending along said lid and bottom parts, and including two scores spaced apart a short distance, one of said blank parts having corner cut-out areas varying in depth by substantially the distance between the spaced scores. 25

9. A container blank having lid and base parts 30 and an intermediate wall part all integral with each other, said blank also having marginal wall parts and having score lines to provide for deflecting the wall parts, certain of said score lines being plural, extending along said lid and bottom parts, and including two scores spaced apart a short distance, said blank having cut-out areas at its corners and in line with said intermediate wall part and being of different depths, and said spaced score lines being respectively in line with the inner edges of said cut-out areas of different depth. 40

10. In a container, in combination, base and lid parts made of a single integral piece of sheet material, said base part having a wall part with 45 which the lid part is integral, a hinge integral with the lid part and an adjacent part to provide for opening and closing movements, marginal wall parts integral with said base and lid parts, and plural score lines positioned transversely of said hinge and having scores spaced apart a short distance and extending over the 50

base and lid parts, the wall of said lid part being turned on one of said spaced scores while the wall of the base part is turned on an adjacent score so as to offset the wall slightly for telescopic relation thereof.

11. In a container, in combination, base and lid parts made of a single integral piece of sheet material, said base part having a wall part with which the lid part is integral, a hinge integral with the lid part and an adjacent part to provide for opening and closing movements, marginal wall parts integral with said base and lid parts, and plural score lines positioned transversely of said hinge and having scores spaced apart a short distance and extending over the base and lid parts, the wall of said lid part being turned on one of said spaced scores while the wall of the base part is turned on an adjacent score so as to offset the wall slightly for telescopic relation thereof, and a wrapping strip for the container attached thereto and having a stay tab attached to a wall part of said base part to reinforce a corner thereof. 20

12. A method of making a one-piece container, which includes forming plural score lines in parallel relation to each other, along opposite marginal portions of a blank having integral base and lid parts, breaking down wall sections of the lid part along certain of the scores of said plural score lines, and breaking down wall sections of the base part along other scores of said plural score lines, so as to provide walls of the base and lid parts offset from each other for telescopic engagement. 30

13. A container blank having lid and bottom parts, said blank having marginal wall parts for both the lid and bottom parts, one of said blank parts having a double score line along certain of said wall parts to provide for deflecting or breaking down the latter along one of the scores of said double score line, said blank having cut-out areas of different depths positioned at opposite marginal parts of said blank part with the double score line, one of the scores of said double score line being substantially aligned with the inner edge of one of said cut-out areas and the other score being substantially aligned with the inner edge of the other of said cut-out areas. 45

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