

July 28, 1953

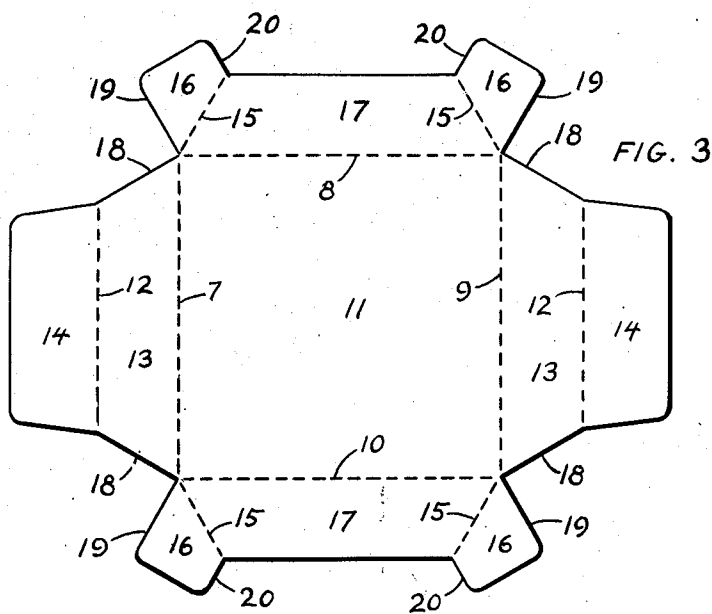
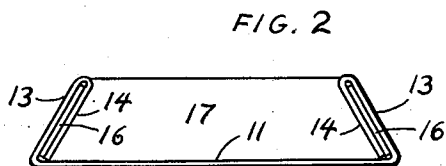
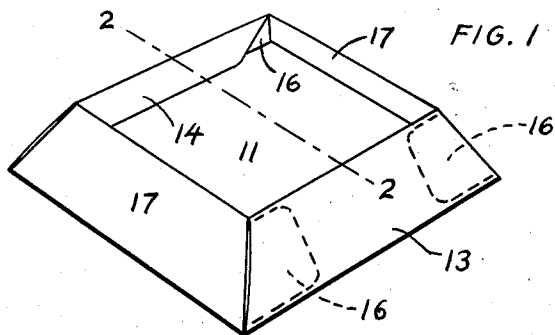
A. BOCKMANN

2,646,915

FOLDING BOX

Filed March 6, 1948

3 Sheets-Sheet 1



INVENTOR.
Arthur Bockmann

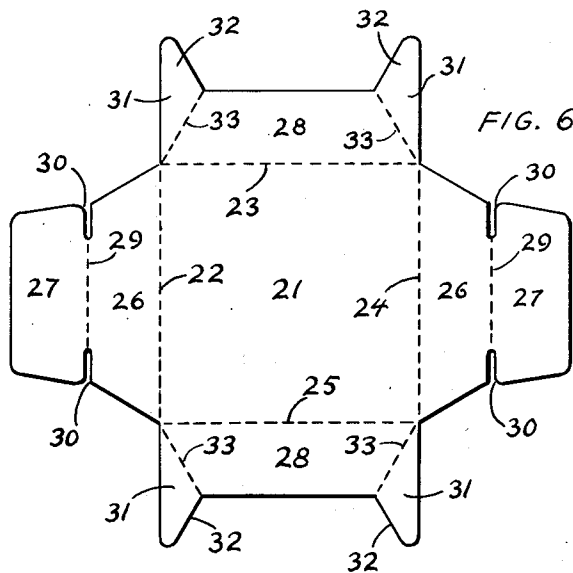
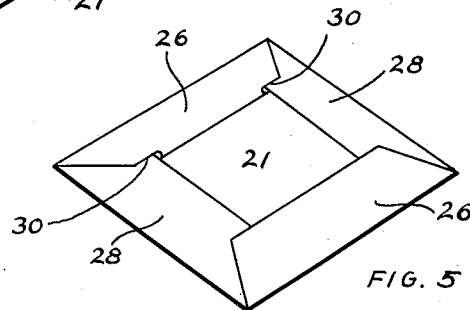
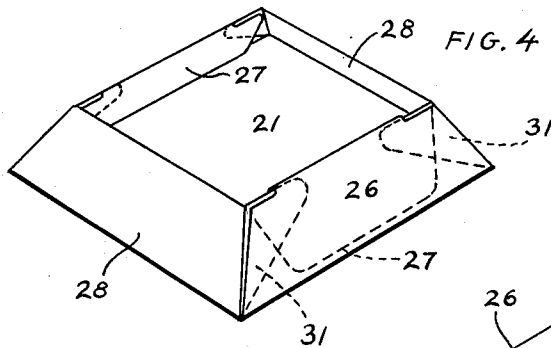
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3 Sheets-Sheet 3

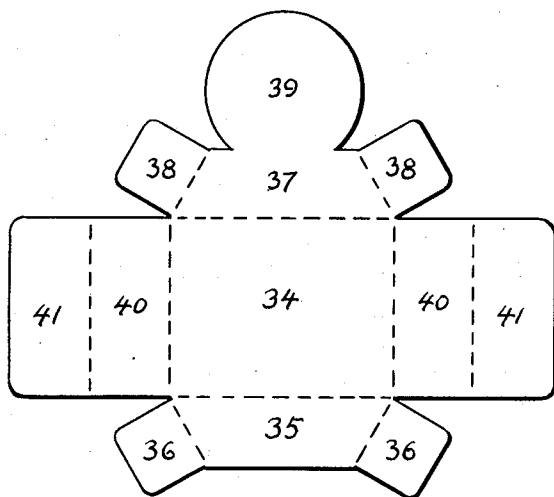


FIG. 7

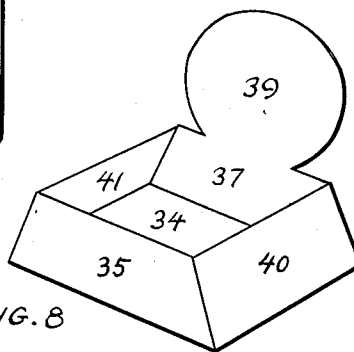


FIG. 8

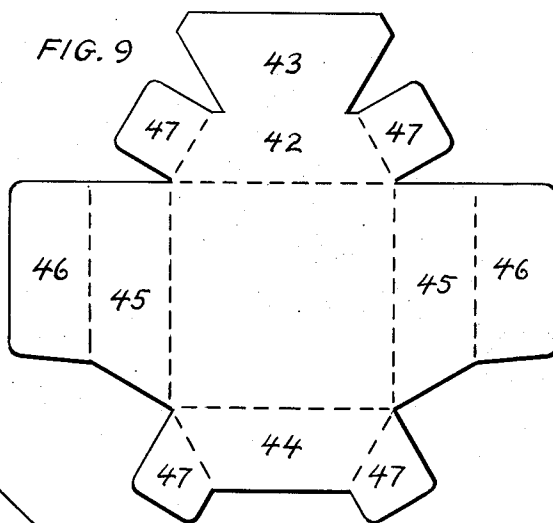


FIG. 9

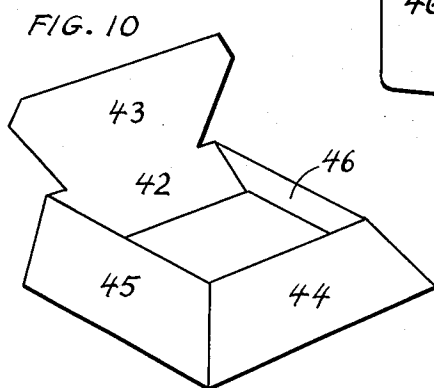


FIG. 10

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Arthur Bockmann

UNITED STATES PATENT OFFICE

2,646,915

FOLDING BOX

Arthur Bockmann, Chicago, Ill.

Application March 6, 1948, Serial No. 13,387

8 Claims. (Cl. 229—34)

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The invention relates to receptacles, boxes or containers composed from a single sheet of material, such as paper, paper-board, fiber-board and the like, cut, scored and folded from a flat sheet condition into the final product. The invention constitutes, in certain sense, improvements over folding boxes or receptacles of the type and construction of that disclosed in Tanner Patent No. 1,833,057, dated November 24, 1931.

One of the primary objects of the invention is to provide a simple and economical construction for a receptacle or the like of the inwardly sloping side wall type, a type especially desirable for various purposes such, for instance, as an ash-tray, pin or button tray, because it is not easily upset or, if tipped, does not easily spill its contents.

Another principal object is to provide a construction and an arrangement of such character that the receptacle or the like may be packaged and shipped either in its flat or unfolded condition and folded or "set up" when desired for use, or in a pre-folded but flattened condition and easily and quickly opened up or "set up" when wanted for use.

Another object is to provide a novel type of receptacle or the like which may be constructed from surface metallized paper, paperboard and other materials for use as an ashtray or for other purposes where fireproofing or waterproofing may be necessary or desired.

Many other objects as well as the advantages and uses of the invention will be or should become apparent and understood after reading the following description and claims and after viewing the drawings, in which:

Figs. 1, 2 and 3 are, respectively, a perspective view of one form of box or receptacle constructed in accordance with the invention, a section taken along the line 2—2 of Fig. 1, and a developed or plan view of the box or receptacle blank after being cut and scored, but before folding;

Figs. 4, 5 and 6 are, respectively, a perspective view of a second form of the invention as the same appears when "set up" for use, a perspective view of the receptacle of Fig. 4 when in a folded and flattened condition for convenience of packing and shipping, and a developed or plan view of the blank as cut and scored ready for folding into either the state of Fig. 4 or that of Fig. 5; and

Figs. 7 and 8, and Figs. 9 and 10, respectively, represent a developed or blank form and a perspective view of each of two modified receptacles.

The blank shown in Fig. 3 is cut or stamped

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out with a die from a sheet of the material chosen for the particular article to be made and, either simultaneously or afterward, scored to permit ease and accuracy of folding along predetermined lines. Dotted lines 7, 8, 9 and 10 indicate score lines which distinguish and define a bottom panel 11, dotted lines 12 indicate score lines distinguishing and defining outer side panels 13 and inner side panels 14, and dotted lines 15 indicate score lines distinguishing tabs 16 from side panels 17 which are segregated from the bottom panel 11 by the score lines 8 and 10.

It is essential, due to inherent features of the invention, that the receptacle have an even number of sides for alternate sides are similar in certain respects with intermediate sides likewise similar to one another in certain respects. In other words, in the four sided receptacle shown the side panels 17 are similar in form and have similar tabs 16 at their ends, while outer and inner side panels 13 and 14, respectively, at one side, are similar to the correspondingly opposite side panels designated by the same reference numbers. If the receptacle has six sides, then there will be a set of three sides having panels of the nature of panels 17 and a set of three sides each with an outer panel 13 and an inner panel 14, with alternation of panel types, as will be understood. The arrangement can be carried out with any even number of sides and with variations in size and shape of bottom and side panels, so long as certain essential functional features are retained.

It will be noted that the score lines 15 are inclined outwardly toward one another (as respects each panel 17) at an acute angle to the score line 10 and that the end edges 18 of each outer panel 13 are likewise inclined at the same angle to the respective score lines 7 and 9. These angles will define the final upward and inward inclination of the side walls with respect to the plane of the bottom panel 11. However, it is not necessary, although in many cases it is desirable, to have all of the side walls 17 disposed at the same angle to the plane of bottom panel 11 or at the same angle at which the walls 13—14 or some of them are disposed with respect to the bottom panel 11, for this angular disposition of the side walls as between sets of side walls or within a set of side walls may be varied by changing the angles of score lines 15, the end edges 18 and the angular dispositions of the edges 19 and 20 of tabs 16 to the score lines 15, all of these angles bearing a relationship to one another, as will be appreciated.

In the embodiment of Figs. 1 to 3, inclusive, the panels 13, 14 and 17 are of the same width (measured perpendicular to the score lines 7, 12 and 8, respectively) so that the resultant receptacle will have walls of equal height or depth. The panels 14 are of a length no greater than the least length of panels 13, that is, no longer than a score line 12, which makes for economy and convenience in folding and "setting up" the receptacle in final form. The "setting up" is performed by folding the side panels upwardly and inclining them inwardly over the bottom panel 11 along score lines 7, 8, 9 and 10, while folding the tabs 16 inwardly of the receptacle so that they lie inwardly of the inner faces of panels 13 or against the inner faces of panels 13. Next, the inner side panels 14 are folded inwardly and downwardly from score lines 12 and over the adjacent tabs 16 until the panels 14 lie against the panels 13 and those tabs over which they were folded.

Since the sides are then inclined inwardly of the receptacle which assumes a truncated pyramid shape, the vertical distance from the top edge of a double thickness side wall (from a score line 12) to the surface of bottom panel 11, will be less than the width dimension of the side wall measured on the incline, wherefore, the inward-turned panels 14 will be held in their folded down positions and, in turn, and together with the inwardly inclined adjacent side walls 17, will secure the tabs 16 so that the tabs 16 cannot escape and the walls 17 cannot move from their positions. If the receptacle is to be used as an ashtray, it is desirable to use a fire resistant material or, as preferred, to employ a material such as paper-board, one side at least of which has been metallized or metal foil covered. In such case the folding is so done that the fire resistant surface is on the inside of the final product.

The form of the invention shown in Figs. 4, 5 and 6, differs from that just described in one important respect, namely, the construction is such that the completely folded and "set up" receptacle may be flattened down to a compact "pre-formed" condition for ease and economy of packaging and shipment in quantity, and yet may be quickly and easily opened out to its receptacle form whenever desired.

The blank is cut and scored as shown in Fig. 6 to provide a bottom panel 21, outlined by score lines 22, 23, 24 and 25, and side forming panels 26, 27, and 28, the panels 26, 27 at each of one pair of opposite or alternate sides being respectively similar, and panels 28 at each of the other opposite or alternate sides being similar to one another. As in the previous form, the sides of the receptacle will be even in number with an equal number of each type of side panel, alternately arranged.

The outer side panels 26 are distinguished from the inner panels 27 both by a score line 29 and slits or slots 30 which extend in from the end edges of the two adjoining panels at their junctures, in alignment with the score lines 29, each for a distance or depth equal to approximately half or slightly less than half of the width (narrow dimension) of a side panel 28. Panels 28 are provided with tabs 31 which in this embodiment are made in a somewhat different shape from the tabs of the previously described receptacle, but the primary characteristic of which is the fact that the marginal edge 32 of each has an overall length somewhat greater than the length (or depth) of a slot 30. Inclined score

lines 33 distinguish the tabs 31 from the side panels 28.

Otherwise than particularly pointed out above, the two forms of the invention are similar in construction and in the method by which they are folded from the blank form into receptacle form. The side panels 26—27 and 28 are folded upwardly, and inclined inwardly over the bottom panel 21, along score lines 22, 23, 24 and 25 while the tabs 31 are bent inwardly at score lines 33 to lie against the inner face of panels 26 (at the ends of the latter) where, when the inner side panels 27 are bent in and down about score lines 29, they will be disposed between the outer panels 26 and the inner panels 27. In this position the marginal edges 32 of tabs 31 will underlie the slits 30 which separate the outer end portions of the upper edges of the outer and inner panels, 26 and 27, respectively, and will extend toward one another beyond the inner ends of the respective slits beneath which they lie. This effectively locks the side walls in their proper positions with respect to one another and to the bottom panel 21 after the manner in which the first described receptacle is "set up."

The slits or slots 30 permit the "set up" receptacle to be folded down to the positions of the parts as shown in Fig. 5. By pressing either pair of opposite sides of the receptacle, as "set up," toward one another with a firm pressure, the receptacle will collapse to the state of Fig. 5, this operation causing the free edges of the single side walls 28, at their corners, to enter the slits or slots 30 and to progress therealong toward the inner ends of the slits until the side walls are completely collapsed against the bottom panel. In this condition the folded receptacles are not only easily packaged and shipped, but are readied for use in a "twinkling" merely by grasping the opposite sides (preferably the double walled sides) and pulling them upwardly and outwardly to their proper "set up" positions.

Utilizing the type and features of construction above described, it is possible and easy to effect many desirable variations, for instance, those of Figs. 7 to 10, inclusive. The box or receptacle shown in Figs. 7 and 8, is constructed with a rectangular bottom panel from which arise two inclined walls and two vertical walls, while attached to one of the vertical walls is a display panel. The two vertical walls are formed from single side panel 35 carrying tabs 36 and from single side panel 37 carrying tabs 38, the display panel 39 being attached to and extending upward in the plane of wall panel 37. The two inclined sides are composed of two panels each, an outer panel 40 and an inner panel 41, which are so folded as to include and lock the respectively adjacent tabs 36 and 38 between them when the box is "set up" as in Fig. 8. This modification may also be provided with slits or slots between the outer and inner side panels 40, 41, after the manner of the form of Figs. 4, 5 and 6, to permit collapse of the folded receptacle, as will be apparent.

The box of Figs. 9 and 10 is constructed to provide a single vertical wall 42 to which a vertically disposed display panel 43 is attached, and three inclined walls of which wall 44 is composed of a single thickness or panel and the two remaining walls are composed of outer and inner panels 45 and 46, respectively. The locking tabs 47 correspond to the locking tabs of the other forms disclosed.

It will be apparent to those skilled in the art

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that the invention is susceptible of many variational embodiments or modifications without departing from the invention spirit. Accordingly, I desire to be limited only by the scope of the appended claims.

I claim:

1. A receptacle of the character described formed from a single sheet of material cut, scored and folded along predetermined lines to provide a container of truncated pyramidal shape having a bottom panel and an even number of upwardly and inwardly inclined sides with alternate sides of like formation and all sides sloping upwardly and inwardly at an angle less than 90° from the bottom panel, each of one set of alternate sides comprising an outer side panel and an inner side panel each of substantially a single unit of height and distinguished from the bottom panel and from one another, respectively, by score lines substantially parallel to one another and to the plane of the bottom panel, the end edges of the outer side panel being tapered upwardly to the junction with the inner side panel at an angle to said score lines approximately equal to the angle of inclination of the sides relative to the bottom panel, and the maximum overall length of the inner side panel between its opposite end edges being no greater than the correspondingly measured minimum overall length of the outer panel between its opposite end edges, each of the other set of alternate sides comprising a panel distinguished from the bottom panel by a score line substantially parallel to the plane of the bottom panel and having a tab on each end thereof distinguished by a score line inclined upwardly and toward the opposite end of such panel at an angle approximately equal to the said angle of inclination of the sides, said tabs being folded along the last said score lines to lie against the inner faces of the respectively adjacent outer side panels of the first said set of alternate sides and when so folded extending upwardly no higher than one of said units of height, the inner side panels of the first said set of sides being folded inwardly and downwardly over an adjacent tab of each of the respectively adjacent side panels of said other set of alternate side panels and to an inclined position substantially parallel to the adjacent outer panel.

2. A receptacle of the character described formed from a single sheet of material cut, scored and folded along predetermined lines to provide a container of truncated pyramidal shape having a bottom panel and an even number of upwardly and inwardly inclined sides with alternate sides of like formation and all sides sloping upwardly and inwardly at an angle less than 90° from the bottom panel, each of one set of alternate sides comprising an outer side panel and an inner side panel each of substantially a single unit of height and distinguished from the bottom panel and from one another, respectively, by score lines substantially parallel to one another and to the plane of the bottom panel, the end edges of the outer side panel being tapered upwardly to the juncture with the inner side panel at an angle to said score lines approximately equal to the angle of inclination of the sides relative to the bottom panel, and the maximum overall length of the inner side panel between its opposite end edges being no greater than the correspondingly measured minimum overall length of the outer panel between

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its opposite end edges, each of the other set of alternate sides comprising a panel distinguished from the bottom panel by a score line substantially parallel to the plane of the bottom panel

and having a tab on each end thereof distinguished by a score line inclined upwardly and toward the corresponding score line at the opposite end of such panel at an angle approximately equal to the said angle of inclination of the sides, said tabs being folded along the last said score lines to lie against the inner faces of the respectively adjacent outer side panels of the first said set of alternate sides and each tab having a side edge extending adjacent and substantially parallel to the score line between the adjacent inner and outer panels of the first said set of alternate sides, the said inner side panels being folded inwardly and downwardly over an adjacent tab of each of the respectively adjacent side panels of said other set of alternate side panels.

3. A receptacle of the character described formed from a single sheet of material cut, scored and folded to provide a bottom wall and an even number of upwardly extending side walls, each of alternate side walls consisting of a single panel having a locking tab at each end thereof attached to such end along a score line extending upwardly relative to and at an acute angle to the line of juncture between such side wall and bottom wall and toward the opposite end of such side wall, all other edges of each tab being free, that edge of each tab which is next adjacent to the upper edge of each alternate side wall and that edge of each tab which is next adjacent to the said line of juncture of such side wall and the bottom wall being substantially parallel to one another, each wall intermediate of said alternate walls being inclined inwardly at an angle to make an angle of less than 90° with the bottom wall and composed of inner and outer connected panels of substantially equal height with the inner panel folded down and substantially against the outer panel inwardly of the receptacle and into contact along its free edge with the bottom wall, an adjacent end tab of each of the adjacent alternate side walls being disposed and held between said folded inner and outer panels of each of said intermediate walls, the said parallel edges of each tab being substantially in engagement respectively and in the order named, with the inside of the fold juncture of the inner and outer panels of the adjacent intermediate wall and the opposed inside surface of the bottom wall.

4. A receptacle of the character described formed from a single sheet of material cut, scored and folded along predetermined lines to provide a container of truncated pyramidal shape having a bottom panel and an even number of upwardly and inwardly inclined sides with alternate sides of like formation and all sides sloping upwardly and inwardly at an angle less than 90° from the bottom panel, each of one set of alternate sides comprising an outer side panel and an inner side panel each of substantially a single unit of height and distinguished from the bottom panel and from one another, respectively, by score lines substantially parallel to one another and to the plane of the bottom panel, the end edges of the outer side panel being tapered upwardly to the juncture with the inner side panel at an angle to said score lines approximately equal to the angle of inclination of the sides relative to the bottom panel, and the

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maximum overall length of the inner side panel between its opposite end edges being no greater than the correspondingly measured minimum overall length of the outer panel between its opposite end edges, each of the other set of alternate sides comprising a panel having end portions that are of said substantially single unit of height and being distinguished from the bottom panel by a score line substantially parallel to the plane of the bottom panel, there being a tab on each end portion of the last said panel, each tab being distinguished by a score line inclined upwardly and toward the opposite end portion of such panel at an angle approximately equal to the angle of inclination of the sides, said tabs being folded along the last said score lines and lying against the inner face of the respectively adjacent outer side panel of the first said set of alternate sides, the inner side panels being folded inwardly and downwardly over an adjacent tab of each of the respectively adjacent side panels of said other set of alternate side panels to positions parallel to the respectively adjacent outer panels, each tab having a side edge extending adjacent and substantially parallel to the fold line between the adjacent inner and outer side panels, the outer and inner panels of each side of said one set of alternate sides being separated from one another along a predetermined length inward from each of the opposite ends of their upper edges for a distance less than the length of the adjacent tab for reception of the upper edge and an adjacent marginal part of the adjacent end portion of the adjacent side panel thereby to permit all of the side panels to be folded down into a collapsed condition upon the bottom panel.

5. A receptacle of the character described formed from a single sheet of material cut, scored and folded to provide a bottom wall and an even number of upwardly extending side walls, each of alternate side walls having a locking tab at each end thereof attached to such end along a score line extending at an acute angle to the line of juncture between the side wall and bottom wall and toward the opposite end of such side wall, all other edges of each tab being free, each wall intermediate of said alternate walls being inclined inwardly and composed of inner and outer connected panels of substantially equal height with the inner panel folded down substantially in face-to-face relation to the outer panel inwardly of the receptacle and into contact, along one edge, with the bottom wall, an adjacent end tab of each of the adjacent alternate side walls being disposed and held between said folded inner and outer panels of each of said intermediate walls, each tab having a side edge extending adjacent and substantially parallel to the fold line between the adjacent inner and outer side panels, there being a slit extending along the fold line between said inner and outer panels of each intermediate side wall for a distance less than the length of one of said edges of said tabs from each end of the side wall whereby the sides of the receptacle may be collapsed inwardly to lie flat against the bottom wall.

6. A receptacle of the character described formed from a single sheet of material cut, scored and folded to provide a bottom wall and an even number of upwardly extending side walls, each of alternate side walls having a locking tab at each end thereof attached to such end along a score line extending upwardly at an acute angle

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to the line of junction between the side wall and bottom wall and toward the opposite end of such side wall, all other edges of each tab being free, each wall intermediate of said alternate walls being inclined inwardly and composed of inner and outer connected panels of substantially equal height with the inner panel folded down substantially against the outer panel inwardly of the receptacle and into contact, along one edge, with the bottom wall, the adjacent end tab of each of the adjacent alternate side walls being disposed and held between said folded inner and outer panels of each of said intermediate walls and having a side edge disposed adjacent and substantially parallel to the fold connection between the inner and outer panels between which it is disposed, at least one of said alternate side walls being disposed at an angle to said bottom wall different from the angle of inclination of one of said intermediate walls.

7. A receptacle of the character described formed from a single piece of material cut, scored and folded to provide a bottom wall and an even number of sides each sloping upwardly and inwardly from the bottom in truncated pyramid shape, alternate sides being of like formation, each of one set of alternate sides comprising a panel having a tab projecting from and terminating each end thereof, each of the other set of alternate sides comprising an inner panel and an outer panel of substantially the same height connected together by a fold along a mid-portion of the upper edge of each and folded into substantially parallel relationship with one another to dispose the lower edge of the inner panel adjacent to the bottom wall, and the juncture between the outer panel and the bottom wall the tab of the adjacent end of each adjacent side panel being disposed between the inner and outer panels, each tab having a side edge portion extending adjacent to and at all times underlying said mid-portion fold, the said upper edges of said outer and inner panels being separated from one another outwardly from said mid-portion to each of the opposite ends of such panels whereby the sides of the receptacle may be collapsed inwardly to lie flat against said bottom wall, the length of said edge portion of each tab being greater than the length of separation of said upper edges of said outer and inner panels measured parallel to such tab edge portion.

8. A receptacle of the character described formed from a single piece of material cut, scored and folded to provide a bottom panel and an even number of sides each sloping upwardly and inwardly from the bottom panel in truncated pyramid shape, alternate sides being of like formation, one set of alternate sides consisting of a single panel and including a tab terminating each end thereof and each of the other set of alternate sides being composed of an outer panel and an inner panel of substantially the same height connected together along an upper edge portion of each and folded substantially into face to face relation to one another over a substantial length of the side, each connected outer and inner panel enclosing between them the tab of the adjacent end of each of the two adjacent sides of the first said set of alternate sides, each tab having a side edge extending adjacent and substantially parallel to the fold line between the adjacent inner and outer side panels, and the outer end portions of the upper edges of the outer and inner panels of each of said other set of alternate sides being separated by a slit of less length than said tab

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side edge whereby the sides of the receptacle may be collapsed inwardly to lie flat against the bottom panel.

ARTHUR BOCKMANN.

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