

Sept. 1, 1964

R. W. NEFF ET AL
BULK CONTAINERS

3,146,931

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3 Sheets-Sheet 1

Fig. 1.

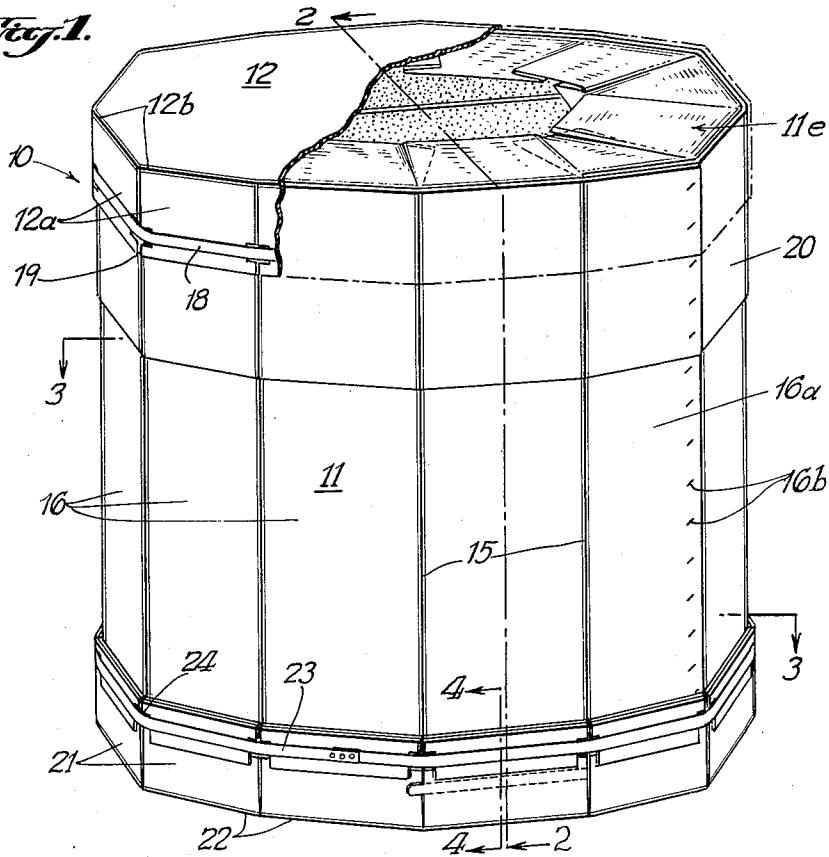
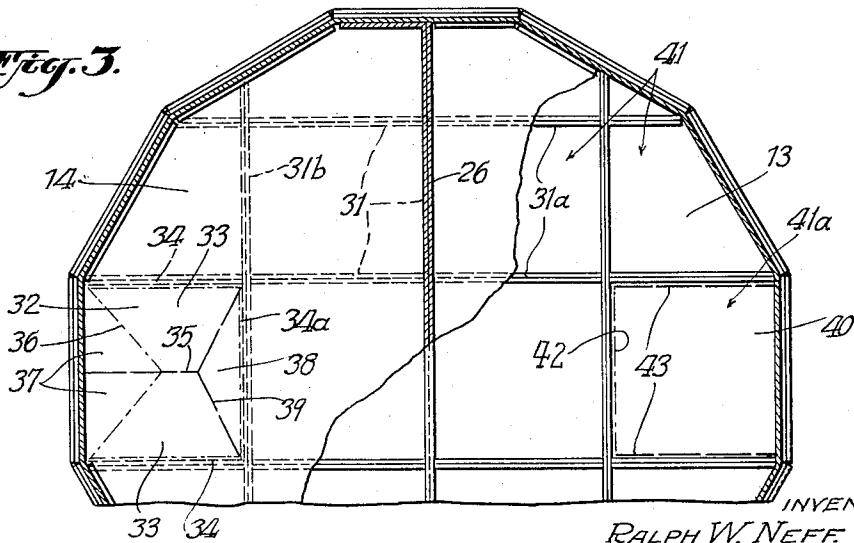


Fig. 3.



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Fig. 2.

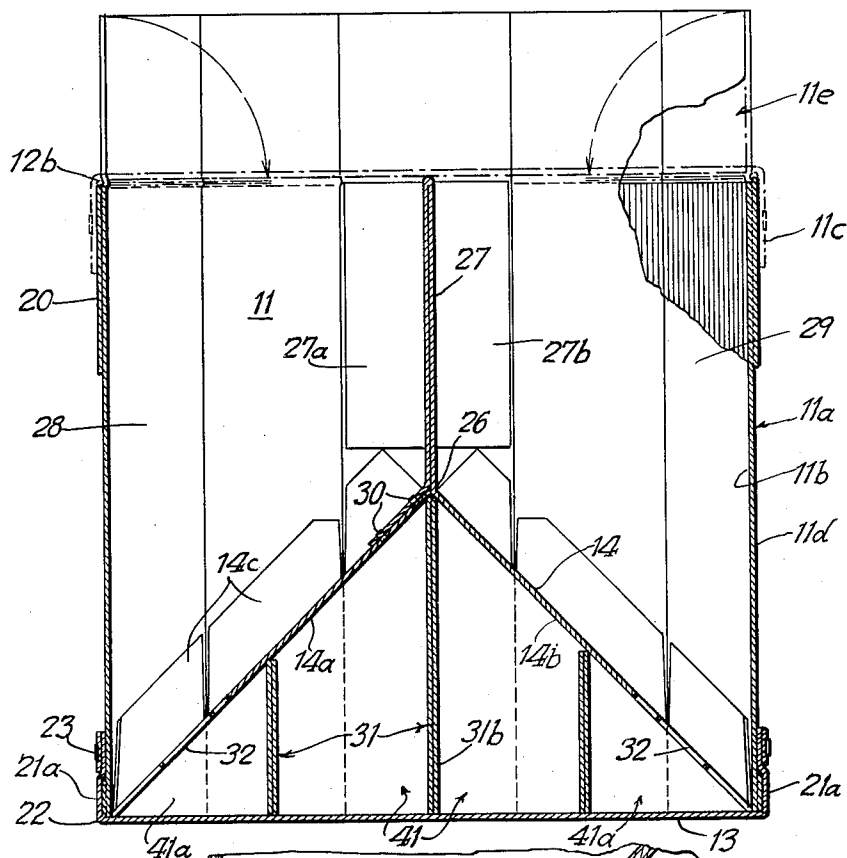
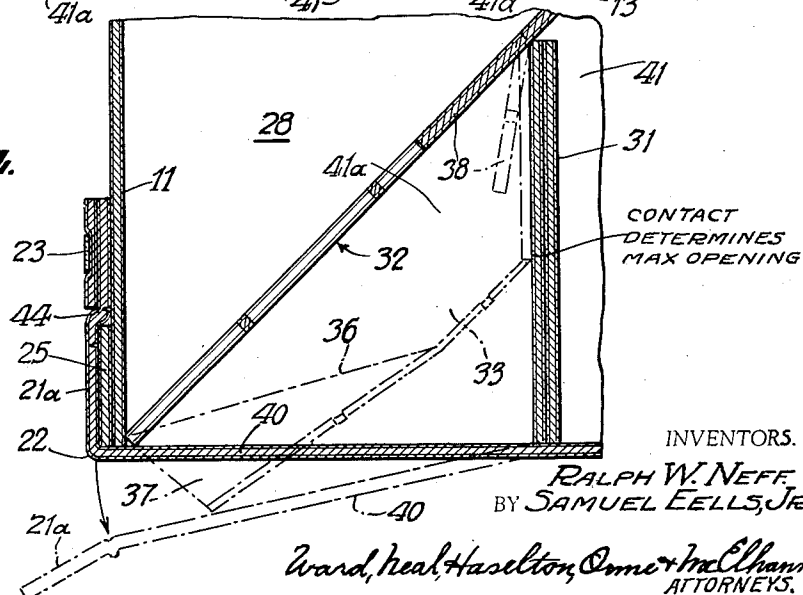


Fig. 4.



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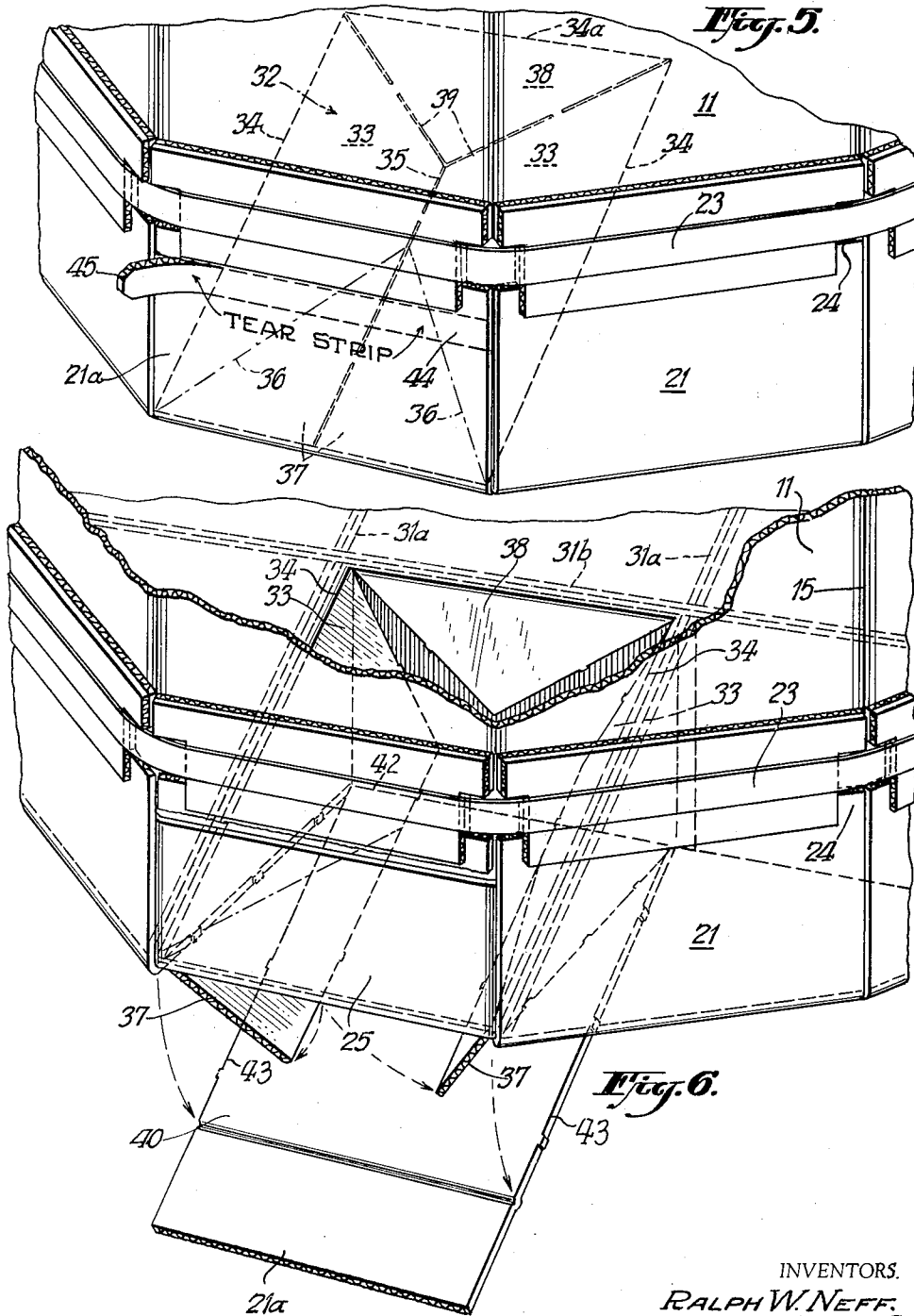
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3,146,931

BULK CONTAINERS

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14 Claims. (Cl. 229—7)

This invention relates to containers for bulk materials and, more particularly, to bulk containers formed of semi-rigid sheet material such as paperboard or the like.

Containers embodying the invention are particularly adapted, among other possible uses, for shipping, handling, and storing comminuted, pulverulent or granular material. Such containers are particularly adapted for the shipment of large volumes of granular material.

The invention provides a collapsible container or carton such as may be supplied by manufacturers of cartons who make it a practice to ship large quantities thereof in collapsed condition to manufacturers or distributors of the commodities, the cartons being of such form that the distributors or manufacturers may readily set them up and fill them by the use of available machinery with little or no change. Heretofore, considerable difficulty has been encountered due to the inter-relationship of cost, size, convenience and structural strength of bulk packaging containers. The present invention is intended to overcome these difficulties and to provide a container which is economical to produce as well as being large, light and structurally strong.

The invention provides a container which permits gravity discharge of the contained bulk materials through its bottom and having an actual bottom and an inclined false bottom, the latter for directing the flow of material towards a discharge opening through both the false and actual bottoms. In the preferred embodiment, two bottom openings are provided such that the material discharges at either side of the bottom or at both sides thereof simultaneously. Discharge of the material is thereby completed without the necessity of vibrating or shaking the entire container, a factor which might prove inconvenient due to the weight thereof. Structural reinforcing members are disposed within the space between the false and actual bottoms to support the former with respect to the latter, and so that the container is provided with additional vertical structural strength. The false bottom and actual bottom have reclosable closure means for dispensing material from the container, as desired.

In its preferred embodiment, the container has a vertical middle partition to provide additional structural strength especially when a filled container is stacked vertically upon another one. That is, a central partition is provided which cooperates with the side walls to provide vertical strength in the container to support the material contained therein, which may be relatively heavy, as would be cement, for example.

It is to be pointed out that there is also another advantage of providing a middle partition. Such partition may be utilized for separating and selectively discharging two grades of a material, i.e. two different types of feed or grain, or two types of cement containing different mixes, etc.

Briefly describing a preferred embodiment thereof, the invention provides a bulk container formed of semi-rigid sheet material such as paperboard or the like and having a body which is preferably polygonal in configuration. Closure means of a suitable nature are provided for the top thereof. The other end or bottom is provided with an internal false bottom and a spaced apart actual bottom. Within the space and interposed between the false bottom and actual bottom is a criss-cross or grid-like arrangement

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of vertical reinforcement members, of similar paperboard or the like, which define a plurality of vertical passages.

The actual bottom of the container is provided with a pair of oppositely disposed tearable flaps which when opened, allow for the passage of material therethrough from the container compartment with which either of the respective flaps are associated. The false bottom is provided with a corresponding pair of tearable closures which are aligned with the respective tearable flaps of the actual bottom and which, when opened, form respective spouts for directing the flow of material from the container downwardly through the false and actual bottoms to discharge beneath the container.

The carton may be completely emptied and all of the contents removed therefrom without leaving or wasting material between the actual bottom and the false bottom. This is of considerable importance particularly when the contents are relatively valuable.

These and other objects, features, and advantages of the invention will become more readily apparent from the following detailed description thereof, when taken with reference to the accompanying drawings in which:

FIG. 1 is a perspective view, partially broken away, to show a bulk container constructed in accordance with the invention;

FIG. 2 is a sectional elevation of the container of FIG. 1, the section being taken as indicated at lines 2—2 of FIG. 1;

FIG. 3 is a sectional plan view of the container of FIG. 1, the section being taken as indicated at lines 3—3 of FIG. 1;

FIG. 4 is an enlarged sectional view to show in detail the construction and operation of the bottom closure means in the container as seen in FIG. 2;

FIG. 5 is an enlarged fragmentary and perspective view showing the bottom closure means in its normally closed position; and

FIG. 6 is an enlarged fragmentary and perspective view similar to FIG. 5, but showing the bottom closure means in its open position for dispensing the bulk material contents of the container.

Referring now to the drawings in further detail, FIGURE 1 shows a container designated generally by reference numeral 10 which is constructed in accordance with the invention. The container 10 has a body 11, a top cover 12, and an actual bottom 13. A false bottom 14 is located interiorly of the body 11 and in substantially spaced relationship with respect to actual bottom 13.

The body 11 is formed from a single blank of sheet material which is scored, along score lines 15, in vertical direction with respect to the body 11, to form a plurality of container side wall sections 16. As indicated in FIGURE 2, the blank from which body 11 is formed is a double-faced corrugated sheet 11a with an inner facing ply 11b and the corrugated ply 11c extending only partially across the height of the outer facing ply 11d, to leave a flexible sheet portion 11e of the outer ply 11d, of several inches in height, projecting above the double-ply principal construction of the body 11. Referring to the cutaway portion of FIGURE 1, it will be understood that the flexible sheet portion 11e, which is only scored by vertical extensions of the score lines 15, will pleat and partially overlie itself at the indicated locations when the cover 12 is placed on the container. However, referring to FIGURE 2, it will also be understood that the flexible sheet portion 11e will stand upright to facilitate the loading of bulk materials into the container from its top end. The two end sections 16a of the side wall section 16 are attached together in overlying relationship one to the other, as by either adhesive or staples 16b.

The top cover 12 is formed from a single sheet of material which is appropriately notched in radial direction

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about its periphery to provide radially extending closure tab portions 12a which are foldable along score lines 12b, so that when the cover 12 is applied to the container 10 in the manner shown by FIGURE 1, the downwardly folded tab portions 12a lie substantially adjacent and together surround the body 11. A steel band 18 disposed about the tab portions 12a secures the top cover 12 to the body 11, and it will be understood that each of the tab portions 12a may be notched at either side thereof as indicated at 19, to better receive the steel band 18. As shown in FIGURE 2, a sealing or stiffening sheet 20 may be interposed between all of the top cover tab portions 12a and the body 11 when the cover 12 is secured to the container, the sheet 20 being continuous.

Similarly, the actual bottom 13 is formed from a single blank of material which is suitably notched in radial direction about the periphery to provide radially extending tab portions 21 thereof which are foldable, along respective score lines 22, so that when the actual bottom is applied to the container the upwardly folded tab portions 21 lie substantially adjacent and together surround the body 11, as perhaps best understood by reference to FIGURE 1. In a manner similar to the securing of the top cover 12, the actual bottom 13 is secured to the container by disposition of a steel band 23 about the actual bottom tab portions 21, the tab portions being notched to receive the same, as at 24. Further, as indicated in FIGURE 4, a sealing or stiffening sheet 25 may be interposed between the body 11 and the folded tab portions 21, the sheet 25 being continuous.

Referring now to the construction at the interior of the container, FIGURE 2 shows that the container 10 is provided with a false bottom 14 which is formed from a single blank of material and which is disposed in substantially spaced relation with respect to the actual bottom 13. In the preferred embodiment, the false bottom 14 provides opposite and downwardly sloping flat surfaces 14a and 14b at either side of the straight, transversely extending line of juncture 26 therebetween. The false bottom blank has foldable tab portions such as are indicated by reference numeral 14c for attachment, as by staples or the like (not shown), to the respectively adjacent side wall sections 16 in the finished container.

A vertical partition 27 extends transversely of the container and upwardly from coincidence with the line of juncture 26 between the oppositely sloping flat surfaces 14a and 14b of the false bottom 14, and divides the container into two adjacent compartments 28 and 29 for receiving bulk material. The upper edge of the partition 27 extends upwardly to the plane of cover 12 when the cover 12 is in its closed position, and it will be seen that the partition 27 provides support at the cover of the container against any weight placed thereon, even though the compartments 28 or 29 may be partially emptied. The partition 27 may be formed integral with the false bottom 14 in a manner as indicated at the right hand side of FIGURE 2, or it may be separately formed from a single blank of folded material and attached to the false bottom 14, as by staples 30, as indicated at the left hand side of FIG. 2. The partition 27 has foldable tab portions such as are indicated by reference numerals 27a and 27b for attachment, as by staples or the like (not shown) to the respectively adjacent side wall sections 16 in the finished container.

The false bottom 14 is supported by an arrangement of criss-cross or grid-like vertical reinforcement members 31, as will be understood from a comparison of FIGURES 2 and 3. Members 31a are positioned transversely with respect to the partition 27 and are triangularly shaped, while members 31b are parallel to the partition 27 and are rectangularly shaped. The members 31 are interlocked, respectively, by means of interfitting slots (not shown) thereby defining a plurality of vertical passages 41. Moreover, due to the interlocking and self-supporting construction and arrangement of members 31,

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stapling or other attachment to other elements of the container is not necessary. Normally, adequate strength is provided when the supporting members are formed from one or two sheets of double-faced corrugated paperboard material having the described interlocking construction, when the same is merely placed within the container against the actual bottom 13.

The false bottom 14 is provided with a pair of oppositely disposed tearable closures adjacent the outer edges thereof as indicated in FIGURE 2, each of the tearable closures being designated by reference numeral 32. Each tearable closure 32 includes a pair of spout panels 33 which are formed by foldable portions of the false bottom, each being foldable towards actual bottom 13 along score lines 34. In their initial condition, the respective spout panels 33 of each tearable closure 32 are connected with each other along a centrally disposed and interrupted line of slit 35 of the closure, and each of the spout panels 33 has a fold line 36 providing a bendable portion 37 thereof. In addition, each tearable closure 32 has a spout guide 38 which is foldable downwardly, towards actual bottom 13, and which in its initial condition is connected to its associated pair of spout panels 33 along an interrupted line of slit 39.

The actual bottom 13 is provided with a pair of oppositely disposed tearable flaps 40, each of which is in vertical alignment with both its respective, associated tearable closure 32 of the false bottom, and one of the vertical passages 41a provided by the bottom reinforcing members 31 with which the tearable closure 32 is also aligned, as indicated by the drawings. The tearable flap 40 is defined by a score line 42 at one end thereof and a pair of spaced apart interrupted lines of slit 43 extending parallel and outward from the ends of score line 42 to the peripheral side edge of the container at tab portion 21a of the actual bottom. By a pair of interrupted slits (not numbered) extending through only the inner ply 11b and corrugated ply 11c, a tear strip 44 is formed integrally with, and is disposed transversely with respect to the tab portion 21a. The tear strip 44 is located below the steel band 23 which secures the actual bottom 13 as aforementioned so that, upon severance of its tear strip 44 and its respective lines of slit 43, each tearable flap 40 is opened without the necessity of removing the steel band 23. Each tear strip 44 is provided with a pull tab 45 so that it may be easily grasped by the operator's hand for tearing.

In the initially assembled condition of the container 10, its tearable closures 32, its tearable flaps 40 and the respective tear strips 44 are in their respective attached conditions as shown by the solid lines in FIGURE 4 and also seen in FIGURE 5. When it is desired to open the container 10 to discharge the material from within either of the compartments 28 or 29, the appropriate tear strip 44 is severed and the tab portion 21a of the actual bottom 13 is pulled downwardly, whereupon the tearable flap 40 is torn from the actual bottom 13 along the interrupted lines of slit 43. The tearable flap 40 is then in a position as shown in FIGURE 6 and as illustrated by the broken lines in FIGURE 4. The corresponding tearable closure 32 in the false bottom 14 is thereupon exposed so that it may be opened by severing its interrupted lines of slit 35 and 39. Either manually or by the weight of the material within the relevant compartment thereabove, the pair of spout panels 33 are folded downwardly towards the actual bottom 13 along score lines 34. Contemporaneously, the associated spout guide 38 is folded downwardly towards the actual bottom 13 along score line 34a. The bendable portions 37 of the spout panels 33 are folded inwardly towards one another both to assist in forming the desired spout configuration and to facilitate closing of the bottom opening, as will be described. As shown in FIGURE 6 and as shown by the broken lines in FIGURE 4, when the tearable closure 32 is opened, the spout panels 33 extend across the space between the

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false bottom 14 and the actual bottom 13 to direct the flow of bulk material discharging from the container 10.

After a desired quantity of material has been discharged from the container 10, the tearable flap 40 may be closed or returned to its original position by lifting upwardly on the tab portion 21a. The tearable flap 40 first engages the bendable portions 37 of the spout panels 33, and it will be understood that, by reason of the relatively opposite directions of fold thereof, the engagement will cause the spout panels 33 to initiate their closing movement in the proper inward direction. Movement of the tearable flap 40 to its closed position within the plane of actual bottom 13 causes only partial closing of its associated tearable closure 32, but will cause adequate restriction and stoppage of the flow of material therethrough. The tearable flap 40 is maintained in such closed position either by external means or by attachment of the tab portion 21 to the side wall of the container. Of course, subsequently, the container 10 may be reopened as desired.

Thus has been described a container for bulk materials which achieves all of the objects of the invention.

What is claimed is:

1. A container for bulk material comprising a hollow body, an actual bottom at one end of said body, and a false bottom disposed interiorly of said body and in substantially spaced relation with respect to said actual bottom, said actual bottom having a tearable flap for providing an opening therethrough, and said false bottom having a tearable closure for providing an opening therethrough, said tearable closure of the false bottom being substantially in alignment with said tearable flap of the actual bottom, and said tearable closure of the false bottom having a central line of tear to provide oppositely disposed spout panels at either side thereof, each of said spout panels being foldable towards said actual bottom and having dimension such that, when said tearable closure is opened, the spout panel extends substantially across the space between said false and actual bottoms to direct the flow of bulk material discharging from said body through said false and actual bottom openings.

2. A container for bulk material according to claim 1 wherein said tearable flap of the actual bottom extends inwardly from the peripheral edge of said actual bottom at one side of the container, and said tearable flap of the actual bottom includes a tab portion providing a free end which is substantially attached to said body at said one side of the container.

3. A container for bulk material according to claim 2 wherein said tab portion has a tear strip disposed substantially parallel to the plane of said actual bottom and substantially across said tab portion at a location thereon spaced away from said attached free end thereof.

4. A container for bulk material according to claim 1 wherein said spout panels have dimension such that, when said false bottom tearable closure and said actual bottom tearable flap are opened, at least a portion of each spout panel projects through the said opening provided by said tearable flap of the actual bottom.

5. A container for bulk material according to claim 1 wherein said tearable flap of the actual bottom is foldable along one end thereof when opened, and said spout panels have dimension such that, when said false bottom tearable closure and said actual bottom tearable flap are opened, at least a portion of each spout panel projects through the said opening provided by said tearable flap of the actual bottom, said portions of the spout panels being bendable in direction towards each other along respective lines of fold extending diagonally across said spout panels.

6. A container for bulk material according to claim 1 wherein said tearable closure of the false bottom further has a plurality of additional lines of tear emanating outwardly from said central line of tear to provide a spout guide at an end of said tearable closure, said spout guide being disposed transversely with respect to said spout

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panels and being foldable towards said actual bottom when said tearable closure is opened.

7. A container for bulk material comprising a hollow body, an actual bottom at one end of said body, a false bottom disposed interiorly of said body and in substantially spaced relation with respect to said actual bottom, said actual bottom having a tearable flap for providing an opening therethrough, and said false bottom having a tearable closure for providing an opening therethrough, said tearable closure of the false bottom being substantially in alignment with said tearable flap of the actual bottom, and said tearable closure of the false bottom having a central line of tear to provide oppositely disposed spout panels at either side thereof, each of said spout panels being foldable towards said actual bottom and having dimension such that, when said tearable closure is opened, the spout panel extends substantially across the space between said false and actual bottoms to direct the flow of bulk material discharging from said body through said false and actual bottom openings, and reinforcing means disposed within said space between said false and actual bottoms and supporting the former with respect to the latter, said reinforcing means comprising a grid-like pattern of interlocked and spaced apart vertical members providing a plurality of vertical passages therethrough, said actual bottom tearable flap and said false bottom tearable closure being disposed in alignment with one of said vertical passages.

8. A container for bulk material according to claim 7 wherein said one of the vertical passages is adjacent one side of the container, and said tearable flap of the actual bottom extends inwardly from the peripheral edge of said actual bottom at said side of the container, said tearable flap of the actual bottom being foldable along one end thereof which is spaced inwardly from, and substantially parallels said side of the container.

9. A container for bulk material comprising a hollow body having a top end and a bottom end, an actual bottom at said bottom end of the body, and a false bottom disposed interiorly of said body, said false bottom having opposite inclined surface portions extending from respective locations substantially within the plane of said actual bottom adjacent opposite sides of the container to intersection with each other at a location which is spaced from said actual bottom towards said top end of the body, said actual bottom having a tearable flap extending inwardly from the peripheral edge of said actual bottom at each of said opposite sides of the container for providing respective openings through said actual bottom, and said false bottom having a tearable closure in substantial alignment with each of said tearable flaps of the actual bottom for providing respective openings through said false bottom, and each of said tearable closures of the false bottom having a central line of tear to provide oppositely disposed spout panels at either side thereof, each of said spout panels being foldable towards said actual bottom and having dimension such that, when its associated tearable closure is opened, the spout panel extends substantially across the space between said false and actual bottoms to direct the flow of bulk material discharging from said body through said false and actual bottom openings with which the spout panel is associated.

10. A container for bulk material according to claim 9 wherein each of said opposite inclined surface portions of the false bottom comprises a plane surface extending substantially across said body.

11. A multi-compartment container for bulk material comprising a hollow body having a top end and a bottom end, an actual bottom at said bottom end of the body, a false bottom disposed interiorly of said body and in substantially spaced relation with respect to said actual bottom, reinforcing means of said false bottom, and partition means extending from said false bottom to substantially within the plane of said top end of the body to provide a plurality of container compartments for re-

ceiving bulk material, each of said container compartments at its lower end being defined by a portion of said false bottom, each said portion of the false bottom having a tearable closure for providing an opening there-
 through, and said actual bottom having a plurality of
 tearable flaps corresponding in number to the number of,
 and being respectively aligned with said tearable closures
 of the false bottom for providing respective openings
 through said actual bottom, and each of said tearable
 closures of the false bottom having a central line of tear
 to provide oppositely disposed spout panels at either side
 thereof, each of said spout panels being foldable towards
 said actual bottom and having dimension such that, when
 its associated tearable closure is opened, the spout panel
 extends substantially across the space between said false
 and actual bottoms to direct the flow of bulk material
 discharging from one of said container compartments
 through said false and actual bottom openings with which
 the spout panel is associated.

12. A multi-compartment container for bulk material
 comprising a hollow body having a top end and a bottom
 end, an actual bottom at said bottom end of the body,
 a false bottom disposed interiorly of said body, said false
 bottom having opposite inclined surface portions extend-
 ing from respective locations substantially within the
 plane of said actual bottom adjacent opposite sides of the
 container to intersection with each other at a location
 which is spaced from said actual bottom towards said
 top end of the body, and partition means extending from
 said false bottom to substantially within the plane of said
 top end of the body to provide a plurality of container
 compartments for receiving bulk material, each said con-
 tainer compartment at its lower end being defined by a
 portion of said false bottom, each said portion of the
 false bottom having a tearable closure for providing an
 opening therethrough, and said actual bottom having a
 plurality of tearable flaps corresponding in number to the
 number of, and being respectively aligned with said tear-
 able closures of the false bottom for providing respective
 openings through said actual bottom, and each of said
 tearable closures of the false bottom having a central line
 of tear to provide oppositely disposed spout panels at
 either side thereof, each of said spout panels being fold-
 able towards said actual bottom and having dimension
 such that, when its associated tearable closure is opened,
 the spout panel extends substantially across the space be-
 tween said false and actual bottoms to direct the flow of
 bulk material discharging from one of said container

compartments through said false and actual bottom open-
 ings with which the spout panel is associated.

13. A bottom-forming blank for providing a false bot-
 tom in a container for storing and discharging bulk ma-
 terial, said blank comprising a sheet of paperboard ma-
 terial having at least one score line for folding of the
 blank to provide corresponding opposite side portions
 thereof, the peripheral edge of said blank having shape
 such that, when so folded, said peripheral edge con-
 tiguously conforms to the peripheral shape of the actual
 bottom of said container, and said blank further having
 means defining a tearable closure adjacent and centrally
 of said peripheral edge of the blank on each side of said
 score line, each said tearable closure means comprising
 rupturable lines of weakness including a first line of
 weakness and a pair of additional lines of weakness, said
 first line of weakness being disposed substantially per-
 pendicular to, and extending substantially from said pe-
 ripheral edge of the blank towards said score line, and
 said pair of additional lines of weakness respectively ex-
 tending on opposite sides of said first line of weakness,
 each of said additional lines of weakness projecting out-
 wardly from conjunction with that end terminus of said
 first line of weakness which is nearest said score line and
 having an end terminus spaced away from said first line
 of weakness.

14. A bottom-forming blank according to claim 13
 wherein said tearable closure means further comprises a
 pair of parallel score lines extending parallel to said first
 line of weakness on respectively opposite sides thereof,
 each said parallel score line extending between said end
 terminus of one of said additional lines of weakness and
 said peripheral edge of the blank, and respective diagonal-
 ly disposed score lines extending from substantially the
 midpoint of said first line of weakness on opposite sides
 thereof to the respective of said parallel score lines, each
 said diagonal score line extending to that end terminus
 of its said associated parallel score line which is adjacent
 said peripheral edge of the blank.

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