

[54] CONTAINER

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[51] Int. Cl. **B65d 3/10, B65d 5/00**

[58] Field of Search **229/43; 220/97 R, 220/42 C; 222/548, 556; 264/156; 113/120**

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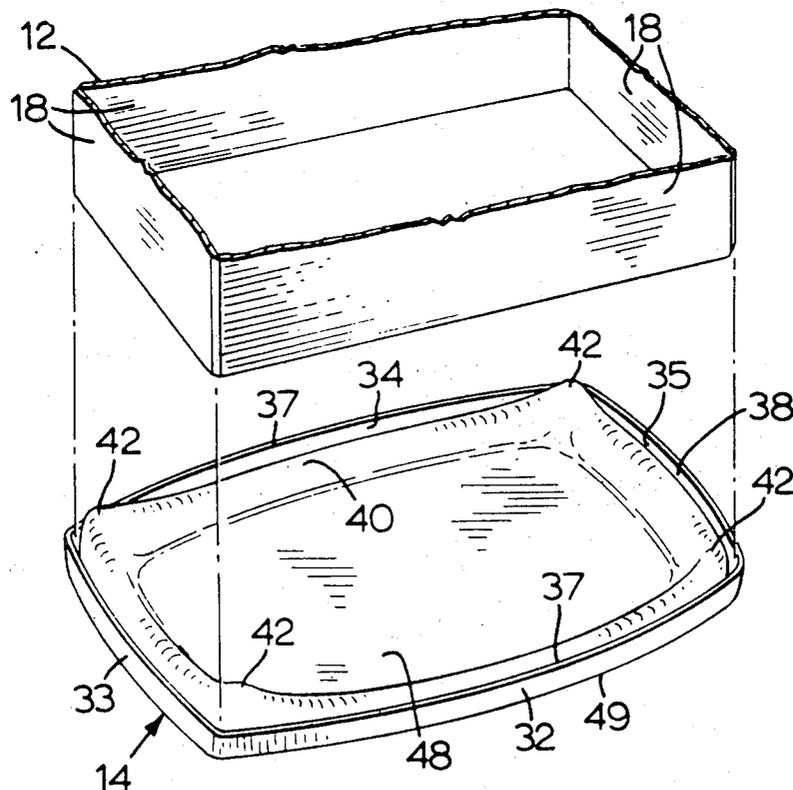
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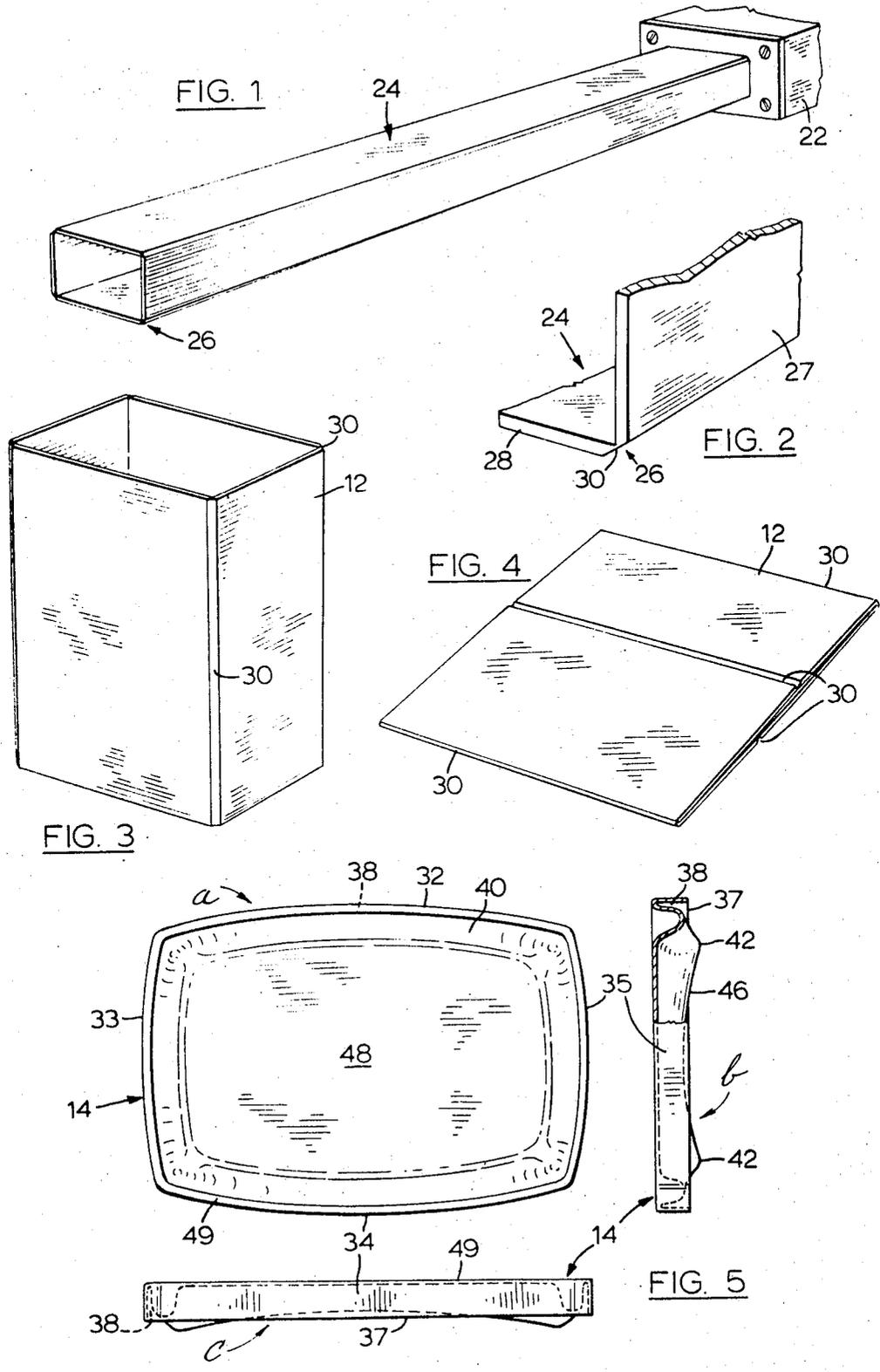
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[57] **ABSTRACT**

This invention provides a container which includes a sleeve member defined by a plurality of articulable panels with parallel edges, and an end-cap adapted to cap one end of the sleeve member. The end-cap has a rim which encompasses the outer edge of the panel ends, and is substantially polygonal so that it is similar to the cross-section of the sleeve member. Inwardly of each corner of the end-cap is a sloping corner-guide which defines with the rim a recess for receiving the respective corner between two panels. The corner-guides all extend beyond the rim and are the first to contact the sleeve member. Thus the panel corners of the sleeve member are guided into alignment with the recesses and improper mating is avoided.

11 Claims, 14 Drawing Figures





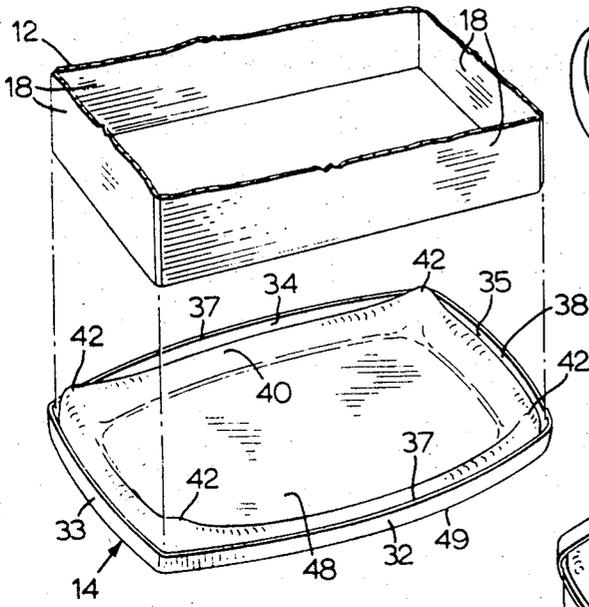


FIG. 6

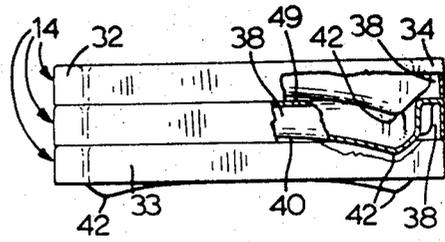


FIG. 7

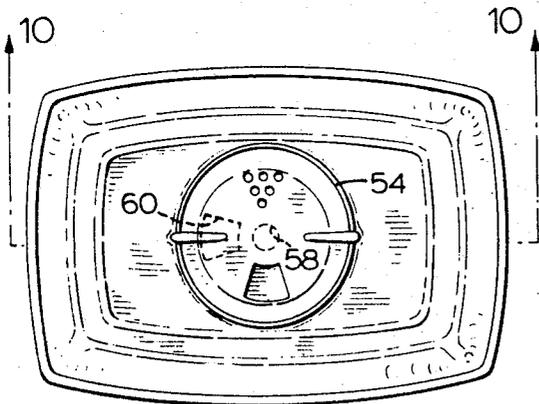


FIG. 9

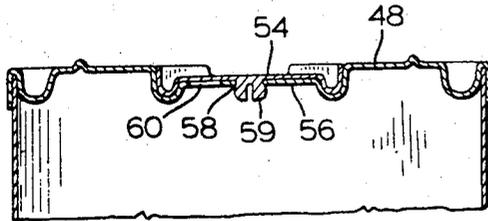


FIG. 10

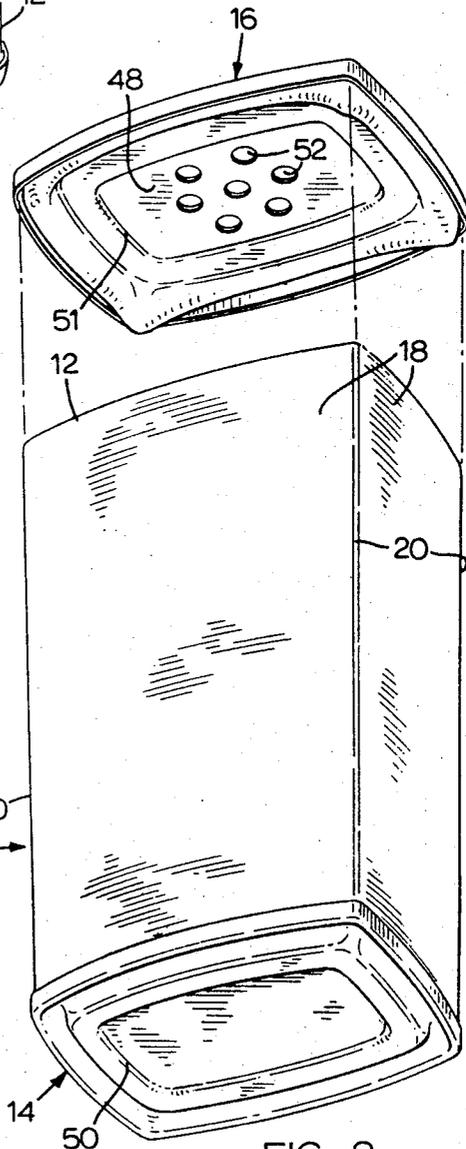


FIG. 8

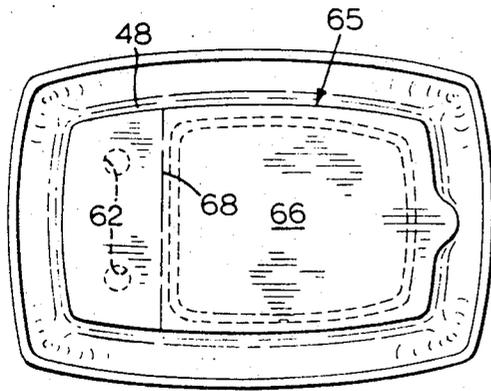


FIG. 11

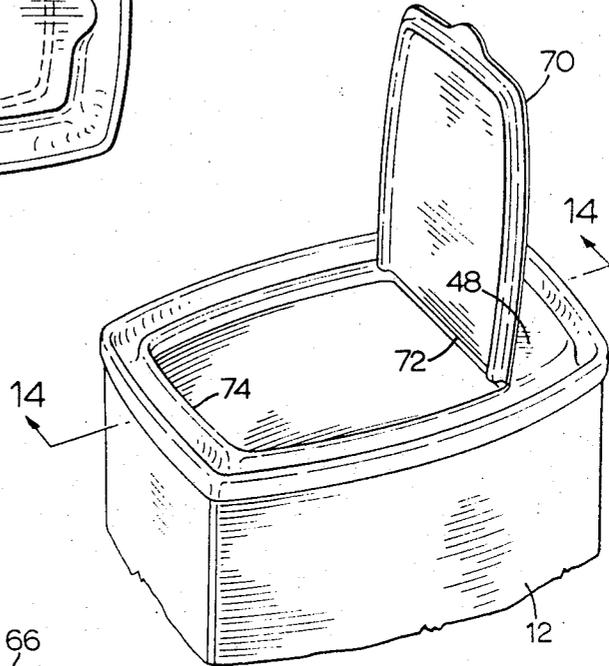


FIG. 13

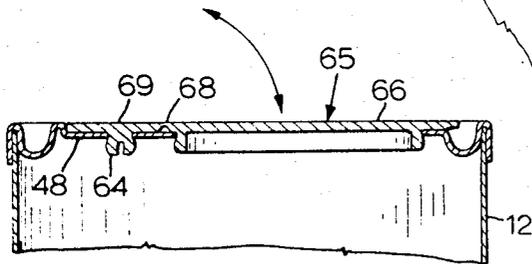


FIG. 12

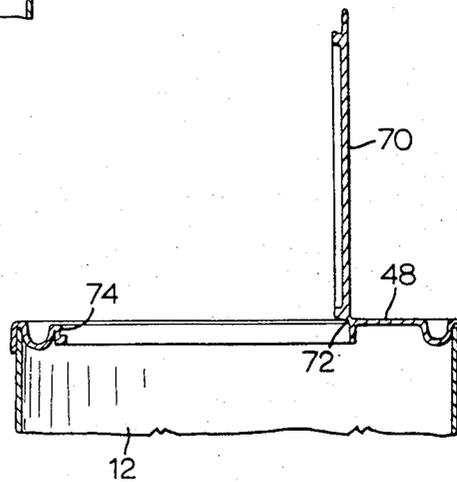


FIG. 14

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CONTAINER

BACKGROUND OF THE INVENTION

This invention relates generally to containers for granular, powdered, liquid and other products, and relates particularly to the design of, and method for fabricating, a container which includes a panelled, open-ended sleeve portion and two end-caps.

In the manufacture and sale at the consumer level of various granular, powdered and liquid products, numerous types of fibre, plastic and metal containers are presently utilized. In particular, cans or containers consisting essentially of cylindrical fibre tubes and circular end-caps enjoy a wide use for household cleansers, cocoa, instant chocolate, baking powder and other products. Liquid products such as motor oil, frozen orange juice, etc. are also presently marketed in convolute or spiral-wound paperboard cans with metal or plastic end-caps.

Most such containers consist essentially of a rigid paperboard tube which is formed on a mandrel, labelled with a separate printed label, and closed at both ends with metal end-caps which are crimped in place. It is customary for this type of container to be shipped as a rigid container with the bottom sealed in place. At the time of filling, the product is loaded through the open end and the container is conveyed along to the final capping stage where the second metal end-cap is crimped into position to form a sealed container. This prior art container has enjoyed wide use for a period of many years, and has proved reasonably satisfactory.

The style of container described immediately above has several intrinsic disadvantages which, with rising labor and material costs, have tended to become very important economic considerations and to result in higher prices at the consumer level. A synopsis of these disadvantages follows:

Because it is customary to ship this type of set-up container in empty condition to the user company, the cost of handling and shipping is greater than that for a folding or collapsing type of container delivered in flat form, because of the bulkiness of the unfilled containers. Companies utilizing this type of container must provide excessive warehousing space to accommodate the storage of the bulky, empty containers prior to filling.

Where the containers are intended for use with either drugs or foods, there is the danger of contamination occurring either in transit or in storage. This may arise due to the entry of dust, dirt or infestation which is retained on the inside of the container as the latter is delivered in set-up, open condition. This problem can arise even though the containers are protected by paper overwrap or corrugated containers.

A further problem sometimes occurs during shipping or warehousing of these type of containers. Due to the very low weight-to-space ratio and to the unsupported open end prior to filling, there is a distinct loss factor due to crushing, distortion and denting, as well as rubbing and defacing of the printed labels on the container during transit.

Yet another disadvantage relates to the fact that, when the full fibre can is shipped after loading with the product, it is not uncommon for the sharp edges of the metal chimes of the end-caps to puncture the paperboard wall of a neighboring container, causing product

leakage or contamination with ensuing losses and claims.

Another disadvantage relates to the excessive time required to stack tubular fibre cans on shelves or display locations in a store due to the necessity of balancing each can on top of the one below, which requires that the narrow rims of the two containers be brought into alignment.

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SUMMARY OF THE INVENTION

This invention essentially involves the provision of a container of unique design, which is capable of being shipped to and stored in the user company in separate folded form, and set up on automatic equipment at the filling stage in the user company plant. The container construction of the preferred embodiment consists normally of three components which, when assembled, form a container of unique shape and possessing improved intrinsic characteristics achieved through novel design and combination of materials in a novel and useful form. The main body of the container is of tubular design, with parallel fold-lines which permit the main body to fold flat for shipping and to set up readily at the stage of assembling and filling. This main body portion would be made from paperboard, plastic or like material. Particularly in the case of the paperboard sleeve, various laminates, coatings, lacquers, etc. could be employed to provide the desired product protection. Because the main body is capable of folding flat, it would be possible to print directly on the component, thus obviating the necessity for applying a separate printed label as a secondary operation.

The end-caps or closures of the preferred embodiment of the invention are of novel design, and provide several advantages to the container disclosed herein. The end-caps are primarily intended to be produced from a thermoplastic material, and the design of the end-caps is such that they may be produced either by thermoforming from sheet material or by injection molding. Other materials such as metal would also be feasible. The caps are also designed to stack or nest for shipping and in the cartridge on a filling machine.

The end-caps are approximately rectangular in plan view with all four sides extending convexly outward in arced fashion, so that all four sides have a slight bulge or outward curve. This feature provides considerable structural strength to the container, so that the latter can withstand severe vertical strain during stacking and palletizing of the filled product in the warehouse. This advantage can be illustrated by taking a small sheet of paperboard and standing it on end. When light pressure is applied along the top edge of the sheet, it will buckle quite readily. However, if the sheet is formed into an arcuate shape, it will readily support a heavy object such as a textbook without bending or distorting. This property of increased strength is obviously a characteristic of a round or cylindrical container as compared to a rectangular container. The container of the present invention, however, has the strength characteristic of a round container, due to the slight arcing of the sides, but has the convenience and the cost advantages of a rectangular container which folds flat for shipping and storage.

When the side wall sleeve portion of the container is opened up at the time of assembly and filling of the product, it opens into a rectangular shape in sectional view. The end closures are of such design as to force

the side walls into the arced configuration as the end closures are inserted into position. This is accomplished by the provision of tapered or sloping corner guides in all four corners of the closure. The corner guides are so designed as to enter into the four square corners of the open rectangular tube, and under pressure of insertion to gradually force the side walls of the container into the desired arced configuration. The base closure or end-cap would be applied first, followed by filling of the container through the open end, in turn followed by the application of the top end-cap. The tapered or rounded characteristic of the corner guides is important in the performance of the closure so that the latter slides into position rather than jamming under pressure. As the closure is pressed into position the side walls of the container are seated into a channel which fits tightly on both sides of the peripheral edges of the side walls of the container. This design configuration also provides for heat-sealing or bonding to both the inner and outer surfaces of the side walls. The structural design of the end caps formed hereby add considerably to the structural strength of the ends and thus of the resulting container. It also makes it possible to utilize lighter weight material than would otherwise be necessary.

The closures when in position on the filled package exhibit a flat band of plastic or like material around the top and bottom edges of the container. There is no inherent danger that this flat band would cause puncture or damage to a neighboring container in the shipping container. This configuration also provides an additional advantage in permitting a narrow separating space between the printed surfaces of the side walls, thus reducing or eliminating abrasion and rubbing of the printed surfaces during transit. Another feature of the preferred embodiment is that the resulting container has problem-free stacking in the retail outlet, with a time-saving advantage. Instead of the containers being balanced or supported through alignment of narrow rims, there is practically full surface contact between the bottom of a container and the top of the container below. To prevent sliding of the two surfaces and to assist in a neat alignment of the packages on display, a locator rim can be incorporated as will be described hereinafter.

It will therefore be apparent that one object of the preferred embodiment of this invention is to provide a container construction free of the disadvantages enumerated above in connection with the prior art containers.

Another object of the preferred embodiment is to provide a collapsible container which may be shipped in flat form, with the attendant reduction of shipping costs.

Yet another object of the preferred embodiment is to provide a container construction which greatly simplifies handling and reduces the necessary warehousing space.

Still another object of the preferred embodiment is to provide a container construction for which the risk of contamination by dust, etc. prior to the filling stage is substantially eliminated.

Yet another object of the preferred embodiment is to provide a container construction which, when filled, requires approximately 25 percent less shelf space than prior art cylindrical containers.

Another object of the preferred embodiment is to provide a container construction to which a label or wrapping may be applied, and of which the configuration is such as to improve the readability of the printed material on the label or wrapping.

A still further object of the preferred embodiment is to provide a container construction which may be readily crushed after it has been exhausted, thereby saving space during disposal.

A further object of the preferred embodiment is to provide a container construction which may be printed directly by any of several printing procedures, rather than requiring a separate labelling operation.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. 1, 2, 3 and 4 are perspective views illustrating several stages in the manufacture of the tube or sleeve portion of the container according to this invention;

FIGS. 5a, b and c are plan, end and side views of the end-cap of one embodiment of this invention;

FIG. 6 is a partly broken-away perspective view of the end-cap of FIG. 5 and a portion of the tube or sleeve section of the container of this invention;

FIG. 7 is a side elevation showing the nesting of the end-caps of FIG. 5;

FIG. 8 is an exploded perspective view of the completed container of this invention, showing the end-cap of the second embodiment;

FIGS. 9 and 10 are plan and side views, respectively, of a portion of a container according to this invention which incorporates an end-cap showing the third embodiment;

FIGS. 11 and 12 are plan and side views, respectively, of a portion of the container of this invention, showing the end-cap of the fourth embodiment; and

FIGS. 13 and 14 are perspective and sectional views, respectively, of part of the container of this invention, showing the end-cap of the fifth embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Attention is directed first to FIG. 8, which shows the container 10 of this invention to consist essentially of a sleeve member 12, a bottom end-cap 14 and a top end-cap 16.

The sleeve member 12 is open at both ends and is defined by four panels 18 (only two visible in FIG. 8) articulably connected with one another at parallel edges 20. The sleeve member 12 can be made of cardboard, fiberboard, plastic, or any other suitable material. A large number of suitable materials are available, and the choice will naturally depend on the requisite characteristics of the final container as well as the nature of its contents. Where the sleeve member 12 is to be manufactured from sheet material, a suitable die-cut blank would be formed, and would be put through the usual creasing, bending and gluing steps to form a suitable tubular sleeve member.

It is a feature of the preferred embodiment of this invention that the sleeve member 10 be capable of being folded flat for storage and shipping purposes, and to permit direct printing onto the surface of the sleeve member, should this be desired. By printing directly onto the surface of the sleeve member 12, it is possible to obviate the necessity for the secondary wrapping of advertising material at a later stage.

An alternative method of manufacturing a suitable foldable sleeve member 12 is illustrated in FIGS. 1 to 4, to which attention is now directed.

In FIG. 1, an extruding die 22 is designed such that it produces a hollow, rectangular extrudate 24 having four walls of uniform thickness, each pair of adjacent walls being connected integrally together through a thin flexible web, running the entire length of the extruded corner. FIG. 2 shows, to a larger scale, the configuration of a corner 26 of the extrudate 24. A first wall 27 is integral with a second wall 28 through a thin web section 30.

The extrudate 24 is preferably of a material which, in thin section, is capable of repeated flexing without rupture. Two satisfactory materials which could be used for the extrudate 24 are high-density polyethylene and polypropylene.

After it has cooled, the extrudate 24 can then be cut transversely to form a plurality of sleeve members 12, shown in FIG. 3, and because of the four thin web sections 30 at the four corners of the rectangular section, the sleeve member 12 incorporates what is commonly known as the "living hinge" principle, and can be folded flat in the manner of a parallelogram linkage, to assume the shape shown in FIG. 4. In this flattened condition, a large number of sleeve members 12 can be stacked, stored or transported in an absolute minimum of space.

Attention is now directed to FIG. 5, which shows the bottom end-cap 14 in plan, end and side views. The end-cap 14 has four sides 32, 33, 34 and 35, each of which is outwardly convexly arced. The four sides 32-35 extend between four corners which constitute the corners of a true hypothetical rectangle.

The internal configuration of the bottom end-cap 14 shown in FIG. 5 will now be described with reference to FIGS. 5, 6 and 10. The plan portion of FIG. 5 is a view from underneath the bottom of the end-cap 14 when it is in place at the bottom of the container, and thus FIG. 5 shows the side opposite to that visible in FIG. 6.

The end-cap 14 has firstly a rim 37 running around the periphery of the end-cap, the rim 37 defining one edge of a peripheral groove 38 which opens away from the viewer in FIG. 5 and opens upwardly in FIG. 6. The other side of the groove 38 is defined generally by a raised rib 40 which has a very specialized profile as described hereinafter.

Firstly, the raised rib 40 can be seen generally to follow around the periphery of the end-cap 14 closely adjacent the rim 37. At each of the four corners of the end-cap 14, the raised rib 40 comes to a local peak as is clearly visible in FIG. 6, and each of these peaks constitutes a sloping corner guide 42. Each of the sloping corner guides 42 is smoothly curved, and slopes convexly inwardly from its respective corner, as is particularly seen in the further left-hand corner-guide 42 shown in FIG. 6. Thus each corner-guide 42 slopes down toward its respective corner with an ever-increasing slope, and its lower portion defines, with the adjacent portion of the rim 37, a recess which is part of the groove 38.

Between the two sloping corner-guides 42 at either end of the side 33, as seen in FIG. 6, the raised rib 40 diminishes smoothly in a lower and more rounded profile. At the mid-point of the raised rib 40 adjacent the side 33, its profile is that shown in dotted lines at 44 in

the side elevation portion of FIG. 5. The end elevation portion of FIG. 5 shows the smooth curve 46 defining the top of the raised rib 40 between the two respective corner-guides 42.

The raised rib 40 undergoes the same gradual reduction and rounding of profile adjacent the side 35.

For the sides 32 and 34, the raised rib 40 spans greater distance, but essentially undergoes the same diminution and rounding of profile between the respective corner-guides 42.

The profile of the raised rib 40 at the mid-points of each of the sides 32-35 has been shown to lie wholly within the rim 37, but this is not an essential part of the invention. What is essential is that the corner-guides 42 extend beyond the rim 37 and diminish smoothly in the directions away from the corner-guides 42.

It is to be noted that the intermediate rounded portions of the raised rib 40 are not essential to the preferred embodiment of this invention, nor is the convex curvature of the panels. The guiding of the panel corners into the respective corners of the groove 38 requires only the sloping corner-guides 42, which must project beyond the rim 37, but is not dependent upon the presence of the intermediate rounded portions of the raised rib 40, particularly where the corresponding panel is not convexly arced. In this connection, it may be mentioned that while the preferred embodiment has all panels convexly arced, it would be possible to have some, one or none of the panels in curved configuration.

It is also to be noted that the end-cap need not terminate at the rim 38. It will be understood that the rim could connect integrally with an exterior flange projecting outwardly of the rim, which could give the cap a somewhat different overall configuration. In the appended claims, the term "rim" is to be understood to refer merely to a surrounding wall portion adapted to embrace externally the marginal edges of the panels. It does not imply that the end-cap necessarily terminates at the rim.

Internally of the raised rib 40 is a planar wall 48 which is preferably coplanar with the bottom 49 of the groove 38. This coplanar characteristic is advantageous for purposes of stacking, as will appear hereinafter.

The end-cap 14 is preferably manufactured by thermoforming or injection-molding, and its walls thus preferably have a uniform thickness throughout, although this is not essential to the invention. For example, the raised rib 40 could be a solid rib rather than a hollow rib, although such a construction would have the minor disadvantage of preventing the nesting or stacking of a plurality of end-caps as shown in FIG. 7. As can be seen in FIG. 7, the hollowness of the raised rib 40, including the rounded corner-guides 42, permits the corner-guides of one end-cap to extend downwardly into the hollow above the corresponding corner-guide on the end-cap next below. Because of the "registering" of corresponding corner-guides in this way, a stack of nesting end-caps tends to remain in stable, stacked condition. This is also an advantage in shipping, handling and in machine technology at the filling stage.

Attention is now directed to FIGS. 6 and 8, with the help of which the corner-guide characteristics of the end-cap will be described. In FIG. 6, the sleeve member 12 is still open-ended, and has no end-caps fitted to it. Because the sleeve member 12 has been constructed

either from normally flat sheet material or in the manner shown in FIGS. 1 through 4, it is substantially rectangular (or of parallelogram section) when unstressed. As the bottom of the sleeve member 12 approaches the bottom end-cap 14 as shown in FIG. 6, the first engagement of the end-cap 14 with the sleeve member 12 takes place on the outer sloping surfaces of the sloping corner-guides 42. Because the corner-guides 42 are rounded and sloping, they act rather like cam surfaces to guide the respective corners at the bottom of the sleeve member 12 toward the corners of the groove 38. As the corners of the sleeve member 12 move closer and closer to the groove 38 under the direction of the corner-guide 42, the remaining portion of the raised rib 40 gradually forces each of the panels 18 to assume the slightly rounded or arced configuration which will permit them to fit into the groove 38. The arcing of the panels 18 also results from a camming effect, and this camming effect is dependent upon the fact that the raised rib 40 has a gradually diminishing profile between adjacent sloping corner-guides 42, and has its point of lowest profile approximately mid-way between the two corner-guides. As the individual panels of the sleeve member 12 approach their respective portions of the groove 38, the lines of contact between the panel and the raised rib 40 extend progressively inwardly from the corner-guides 42, and the diminishing profile, as these lines extend inwardly, of the raised rib 40 causes the panel to arc outwardly in conformity with the groove 38.

It is thus seen that it is essential for the rounded corner-guides 42 to extend upwardly beyond the rim 37, because it is essential that the corner-guides 42 contact the lower edges of the sleeve member 12 to locate the corners thereof before the remainder of the panel edges of the sleeve member 12 come into contact with the raised rib 40.

FIG. 8 shows the sleeve member 12 with the bottom end-cap 14 securely in place. Because the bottom end-cap 14 has arcuate sides, the sleeve member 12 is forced to assume the same arcuate configuration. This makes the fitting of the top end-cap 16 very simple, because it is not necessary for the top end-cap 16 to exert the total arcing pressure against the panels 18 of the sleeve member 12. A minor adjustment in the arc will take place as the top end-cap 16 is placed into position, however.

In FIG. 8, the top end-cap 16 shows the second embodiment of the end-cap, wherein the planar wall 48 has a plurality of dispensing apertures 52 for products such as powdered cleansers, etc.

FIG. 8 also shows a modification of the end-caps 14 and 16 which permits several identical completed containers to be stacked in an interlocking manner. The bottom end-cap 14 has a continuous recess 50 projecting upwardly into the container, whereas the top end-cap 16 has a continuous rib 51 projecting upwardly away from the container. Two containers identical to that shown in FIG. 8 could thus be stacked with the rib 51 of one container registering in the recess 50 of the other.

FIGS. 9 and 10 illustrate the third embodiment of the end-cap of this invention, which includes a dispensing control disc 54 of conventional construction centrally located in the planar wall 48 and accessible from the exterior of the container for rotation. As seen in FIG. 10, the control disc 54 is received within an integral

molded recess 56 in the planar wall 48, the recess having a central aperture 58 for receiving a center button 59 of the dispensing control disc 54, and also having an offset opening 60 (shown in dotted lines in FIG. 9) to which the several dispensing apertures in the dispensing control disc 54 can be turned.

Attention is now directed to FIGS. 11 and 12, in which the fourth embodiment of the end-cap of this invention is illustrated. In this embodiment, the planar wall 48 has two apertures 62 capable of receiving two buttons 64 on an articulating two-piece closure element 65 which includes a shutter portion 66 integral through a web hinge 68 with a retainer portion 69 which supports the buttons 64 and which is held thereby securely against the planar wall 48. The planar wall 48 has a large recess corresponding to the closure element 65.

The fourth embodiment of the end-cap of this invention, just described, is useful when the contents of the container require to be spooned out.

Attention is now directed to FIGS. 13 and 14, in which the fifth embodiment of this invention is shown. In FIGS. 13 and 14, the end-cap includes an integral shutter lid 70 which is joined through a web hinge 72 with the remainder of the planar wall 48.

FIG. 14 shows the position in which the end-cap of the fifth embodiment would be molded, with the shutter lid 70 in its open position. An integral locking or engagement flange 74 of conventional construction is provided where shown in FIGS. 13 and 14 to retain the shutter lid 70 in its closed position until opening.

The end-caps can be sealed to the sleeve member 12 in any of several conventional ways. For example, the rim 37 can be heat-sealed to the sleeve member, or alternatively glue or other adhesive material could be applied to the end edges of panels of the sleeve member 12 prior to affixing the end-caps. In the embodiment in which the raised rib 40 is hollow, it is possible to heat-seal both sides of the groove 38 against the sleeve member 12.

It is thus seen that there has been provided a rigid type of container, primarily for granular products although not necessarily restricted thereto, and which is capable of being shipped, stored and printed in flattened form. There is thus effected substantial savings not only on material costs, but in shipping costs, warehousing costs, etc. The sleeve portion of the container can be made on standard folding carton equipment or can be manufactured as shown in FIGS. 1 through 4. Contrast with this the conventional tube which is made on tube winding equipment with a separate wrap applied as a secondary operation and which must be shipped in the set-up form to the customer.

The container design disclosed herein provides a novel and attractive appearance in addition to providing substantial savings in terms of shipping. It will be appreciated that the size of the shipping carton for a given number of containers will be considerably reduced, the providing considerable cost savings on corrugated cartons, warehousing space and shipping charges.

Moreover, at the retail level it is possible to place four containers deep on an average shelf in the same area occupied by three conventional cylindrical containers holding the same quantity of material per inch of height. This advantage would be an obvious boon to supermarket chains, etc. not only in better utilization

of space, but in reducing the out-of-stock position due to the fact that about 25 percent more product can be displayed in the same space.

It is believed that the complete system of assembly and application of the end-cap can be automated and co-ordinated with present filling equipment.

A further advantage of the container disclosed herein is the fact that the printed material on its outer surface is more easily readable in a supermarket by the shopper with her shopping cart. With conventional cylindrical containers, the container must be viewed from straight-in-front in order to read the label which wraps around the tube. By contrast, the copy on the container disclosed herein can be read more readily regardless of the direction of approach.

A further advantage of the container disclosed herein is that it will fit more conveniently on narrow shelves in areas such as bathroom medicine cabinets, etc.

A further advantage of the container disclosed herein relates to the fact that the sleeve member part of the container having been originally manufactured, shipped and stored in the flattened condition, can be easily returned to the flattened condition for waste disposal after the contents of the container have been emptied.

In addition to the improved appearance on display, including a larger shelf facing and an increased appearance of value, there is a greater apparent size distinction between, for example, one-half pound and one pound sizes.

As mentioned above, the novel design of the end-caps of the container disclosed herein provides for easy stacking in the retail outlets, due to the fact that the planar wall 48 is flush with the bottom 49 of the groove 38.

The fourth and fifth embodiments of the end-caps of the container disclosed herein provide an added convenience for the consumer in using these products. Spooning-out of the product can be accomplished easily and safely, with no risk of cutting fingers on sharp metal edges.

In addition to the savings in shipping, storing, etc., the fact that the sleeve member is capable of folding flat offers the following advantages:

a. It may be automatically produced on existing high-speed equipment.

b. Full color, top caliber printing by either letterpress, offset, or gravure printing is possible directly onto a wide selection of folding boards, without the need of a separate labelling operation.

c. A wide variety of coatings, laminations, lacquers, etc. can be applied to provide for product protection or improved appearance. These coatings may be applied either inside, outside or both.

d. It is a simple matter to install a Mylar or acetate window in one or more of the walls in order to "show" certain products.

e. The hazard of contamination of a stored collapsed sleeve member due to dust, dirt or infestation is greatly reduced.

Two further advantages of this construction relate to the fact that, when several of the containers of this invention, after filling and setting up, are arranged in tightly packed rows either on the retail shelf or in a shipping carton, the fact that all of the container side walls are arcuately curved convexly outward guarantees that every corner between adjacent side panels on

every container will be completely free from contact with another container. Adjacent containers will touch each other only at the mid-points of their outer cap rims or bands which provide protection to the printed surfaces. The first advantage relates to the fact that the outside corners of the rim 37, where the cutting potential is expected to be the highest, are kept free from contact with any part of the other container. The second advantage relates particularly to the method described above in connection with FIGS. 1 through 4, and has to do with the fact that each of the vertical edges between adjacent panels in a container includes a thin-section living-hinge web, which because of its thin section is somewhat more prone to puncture than the thicker central portions of the panels.

It is to be understood that this invention is not limited to a four-sided sleeve member. It is clear that the corner-locating properties of the corner-guides incorporated into the end-caps will apply to any number of sides. The flat-folding characteristic, however, depends on the condition that there be two groups of contiguous sides such that the sum of the widths of the sides of one group equal the sum of the widths of the sides of the other. For example, a regular hexagon or octagon would fit this formula, whereas a regular pentagon would not. An irregular pentagon could be designed to accord with the formula, however. Also, any polygonal shape, whether regular or irregular, could be made to fold flat by providing a false-fold in the appropriate location in one of the sides. For example, an equilateral triangle will fold flat if a false-fold is provided mid-way of one of the sides.

It is also to be understood that this invention would be worked by providing a sleeve member with only a single end-cap as described hereinabove. If, for example, it were desired to provide an open-topped container for protecting an item of merchandise in such a way that the item were visible from above, only a single end-cap (the bottom end-cap) would be provided. It will be appreciated that a single end-cap will suffice to hold the panels of the sleeve member in arcuate configuration. Again, a "window-container" could be provided, having an end-cap on the bottom and a transparent (acetate, vinyl, cellophane, etc.) sheet glued over the top end. Also, it is possible to provide two telescoping sleeve members, one slightly larger in section than the other, with one end-cap apiece, thus constituting a box-and-lid container which would be of double strength and could be taped or sealed in the closed condition.

It is further pointed out that one or both end-caps could be made of transparent material, such as vinyl, acetate, or propionate.

It should also be noted that the upper end-caps, when they include an inner skirt as shown in FIGS. 11 to 14, could be sealed by an inner foil or parchment membrane which would have to be punctured by the consumer in order to reach the contents. The membrane would also constitute a further barrier against flavor and moisture loss.

In the appended claims, the expression "rounded rib" refers to a portion of the raised rib 40 which lies between two adjacent corner-guides 42.

I claim:

1. A container, comprising:

a sleeve member consisting of a plurality of panels having edges connected with one another to define corners and ends defining an opening; and
 a cap provided with a rim adapted to embrace said ends of said panels, said rim including a plurality of sections corresponding to said panels, a sloping corner-guide formed inwardly of each junction of adjacent sections, a portion of each corner-guide defining in conjunction with said rim a recess for receiving said corner of adjacent panels, each of said corner-guides extending beyond said rim and being adapted to guide each of said corners of adjacent panels into alignment with said recess.

2. A container as in claim 1, said corner-guides merging into intermediate rounded ribs inwardly adjacent said rim between said junction of adjacent sections, said corner-guides and rounded ribs defining with said rim a continuous groove of which said recesses are a part.

3. A container as in claim 2, at least one of said sections of said rim being convexly arced away from the center of said cap, said groove following the contour of said rim.

4. A container as in claim 3, the profile of said rounded ribs being lower than the profile of said corner-guides but increasing gradually toward said corner-guides to merge smoothly into same.

5. A container as in claim 4, said sections of said rim being convexly arced away from the center of said end-cap, said groove following the contour of said rim.

6. A container, comprising:
 a sleeve member open at both ends and including at least four rectangular panels articulably connected

with one another at parallel edges; and
 an end-cap having a plurality of sides equal in number to said panels, a groove along the sides of said end-cap adapted to receive said ends of said panels, said groove at each side being slightly outwardly curved, the inner wall of said groove at the cap corners being defined by sloping corner-guides which extend beyond the outer wall of said groove and slope inwardly away from said groove, said corner-guides merging smoothly into lower-profile rounded ribs defining the inner wall of the groove between adjacent corners.

7. A container as in claim 6, the mid-point peaks of said rounded ribs extending short of said outer wall of said groove.

8. A container as in claim 6, said end-cap including a central panel between said corner-guides and rounded ribs into which the latter smoothly merge.

9. A container as in claim 6, said end-cap having means for dispensing the contents of said container.

10. A container as in claim 6, including a further end-cap identical with said first-mentioned end-cap except that said further end-cap has means for dispensing the contents of said container.

11. A container as in claim 10, in which the first-mentioned end-cap has recess means extending into said container and said further end-cap has protuberance means extending away from said container, said recess means and said protuberance means being complementary such that a plurality of identical containers can interlock when stacked.

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