

[54] **LOCKING STACKABLE CONTAINER**

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[58] Field of Search 220/92 C, 97 F;
229/2.5

[56] **References Cited**

UNITED STATES PATENTS

3,512,677 5/1970 Kovac 220/97 C

3,056,232 10/1962 Chaplin 220/97 C UX

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[57]

ABSTRACT

A stackable container for medicaments having continuous side walls tapering downwardly from an open end toward a bottom surface, with the side walls integrally containing positive locking means, assuring that similar containers can be locked securely to each other with a predetermined amount of force, while simultaneously maintaining uniform spacing between the side walls and bottoms of the nested containers.

6 Claims, 5 Drawing Figures

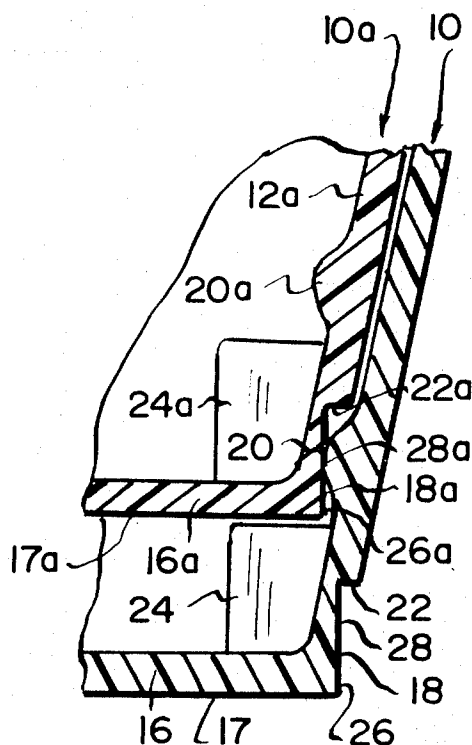


FIG. 1

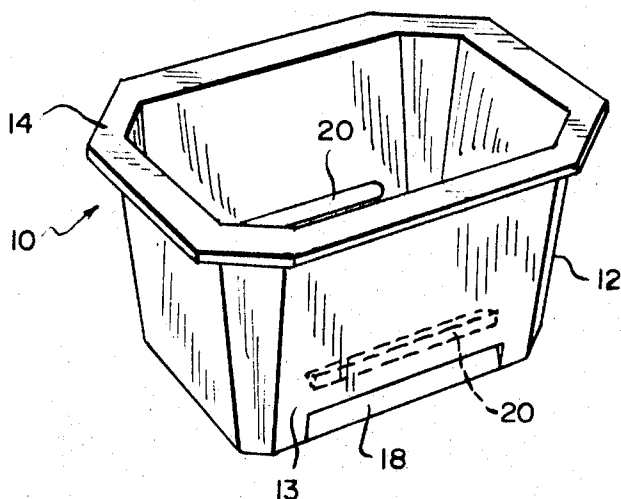


FIG. 2

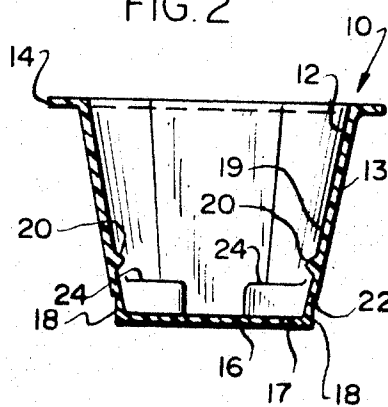


FIG. 4

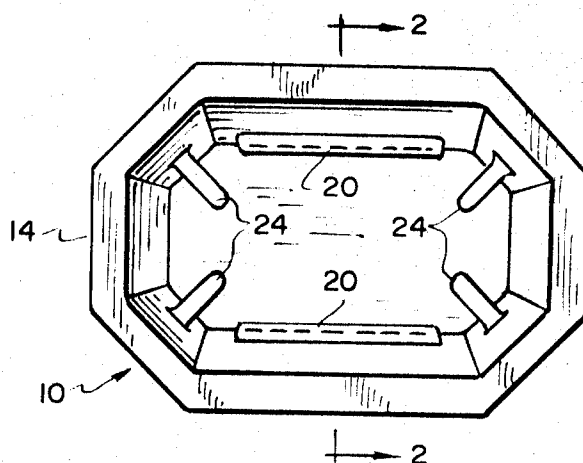


FIG. 3A

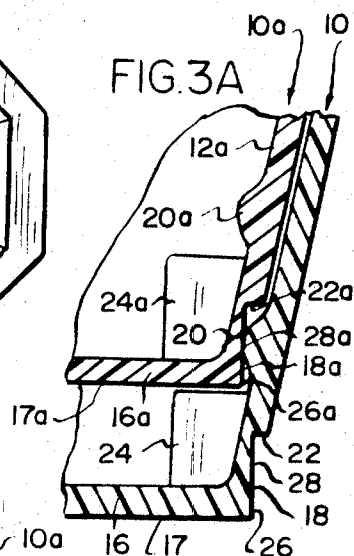
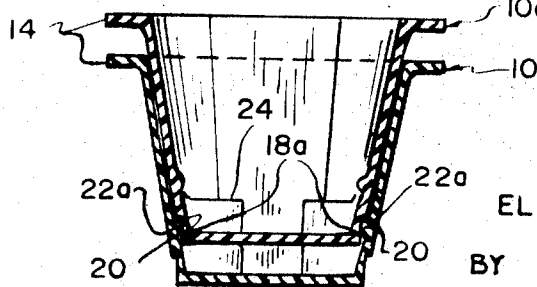


FIG. 3



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LOCKING STACKABLE CONTAINER

BACKGROUND OF THE INVENTION

This invention pertains to containers, and particularly to a container particularly adapted for holding a unit dose of a solid medicament to be administered to a patient in a hospital.

The need for more accurate control, counting, measuring and administering of prescription drugs has been well documented by numerous reports of studies of medication errors and adverse drug reactions. Government and professional organizations researching this problem have recommended packaging more drugs in unit dose or prescription size containers with accurate identification of the drug, quantity, route of administration and other pertinent information on the package.

Unit dose size pre-packaging of orally administered solid drugs has been extremely cumbersome because the quantity per dose or prescription varies from patient to patient. Also, the labeling and identification of a single tablet or capsule results in a package of considerable bulk requiring a volume many times that of the tablet for storage and handling. In addition, individual packaging of tablets, capsules, suppositories and lozenges has not developed a package that is easy to open and use by the patient or nurse administering the drug.

In developing a system for accurately controlling and identifying unit dose dispensing of prescription drugs, it is highly desirable that the package or container for such drugs is capable of being stacked in nested relationship with a plurality of similar containers so that automatic unit dose packaging and dispensing equipment can be utilized. As used herein the term unit dose is defined as any physical quantity of a drug specified by a physician to be administered at one time and not requiring significant physical or chemical alteration before being administered.

While it is well known in the packaging field that stacking features in the form of ribs, anti-friction designs, stacking rings, V-shaped stacking protuberances, horizontal fins or pleats, and bottom stacking ribs with axially directed pleats, can be incorporated into the side walls or bottom of one-piece container constructions, all of these prior art designs have had as their major purpose the elimination of jamming or sticking between adjacent telescopically arranged containers. By making it increasingly easier to separate containers, the prior art devices have attempted to maintain uniform lateral spacing between the side walls of nested containers and the elimination of misalignment of the container stacks when in a feed chute of an automatic dispensing machine.

In some instances, it is desirable and necessary to use stacks of containers that are held together with a minimum uniform force, since it is of utmost importance that only one container be dispensed at any one time. Non-uniform stacking of conventional containers permits the possibility of two containers being dispensed simultaneously.

The present invention relates to a new and novel container for use with automatic dispensing machines that does not require rolled rims or restricted lips in dispensing heads to support the container stack, and for use with machines that do not depend upon gravity as a feed force. In addition, the present container provides for ease of identification of the contents of the con-

tainer and facilitated handling for administration of the contents thereof.

In particular, the present invention provides for a positive locking means integral with the container thereby permitting a plurality of containers to be locked individually together with a predetermined amount of force. The locking means assures that each container is securely fixed to the stack with a uniform minimum amount of force thereby eliminating the non-uniform sticking problem of conventional containers, while at the same time maintaining uniform lateral spacing between the side walls and bottoms of nested containers. The present invention further provides for positive aligned stacking which eliminates stack misalignment encountered with conventional containers with resultant inconsistent feed. In addition, the container is configured such that identification labels may be readily applied for identification of the contents, and the container may be readily gripped to open the same and administer its contents.

Some techniques for maintaining uniform lateral spacing between the side walls of nested containers to eliminate jamming or sticking and stack misalignment have been disclosed in U.S. Pat. Nos. 3,471,075; 3,442,420; 3,441,173; 3,393,826; 3,347,411; 3,139,213; 2,854,790; 3,091,360; 3,208,631; 3,223,305; 3,988,258; and 3,027,596.

SUMMARY OF THE INVENTION

It is accordingly a general object of the present invention to eliminate non-uniform sticking problems, maintain uniform lateral spacing between the side walls of nested containers, eliminate stack misalignment, and eliminate the problem of dispensing two or more containers simultaneously, by providing for an improved thin-walled container having a positive locking means integral therewith, the locking means serving the dual purpose of securing each container, one to another, with a predetermined minimum amount of force, and also functioning to keep stacked containers from misaligning when in the feed chute.

Further objects of this invention are to provide for a thin-walled container incorporating a positive locking means, that permits easy and efficient release of one container from another facilitating mechanical separation and dispensing, and providing a means of assuring that the containers when initially stacked cannot be misaligned.

Still further objects of this invention are to provide for a container particularly adapted for use in a unit dose drug dispensing system for hospital use wherein the container is configured for ease of gripping and manipulation to open the container and administer the drug contained therein, while providing relatively large, unobstructed areas for affixing labels identifying the contents of the container and its intended use.

The novel features which are believed to be characteristic of this invention are set forth with particularity in the appended claims. The invention itself, however, together with further objects and advantages thereof will best be understood by reference to the following description taken in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of the container of the present invention;

FIG. 2 is a cross-section of the container taken along lines 2—2 of FIG. 4;

FIG. 3 is a cross-section showing two containers in stacked relation; and

FIG. 3A is enlarged fragmentary view of the containers of FIG. 3;

FIG. 4 is a top plan view of the container of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The embodiment of the container or cup to be hereafter described is to be made into a seamless one-piece thin-walled construction, formed from thermoplastic, molded by fluid pressure (as one method) into a container. However, other material moldable into such a shape, such a paper or metal foil are also contemplated as within the scope of this invention.

Referring to FIG. 1, the container of the present invention is generally indicated at 10, having continuous side walls 12 on one end integral with a bottom 16, and on the other having a top flange 14 that is contiguous with and extends around the periphery of side wall 12. Flange 14 is also in parallel relation to the bottom surface 16 and is of sufficient width to provide an area that receives a thin flat membrane type seal or cover (not shown) for total closure of container 10. Side wall 12 also tapers upwardly and outwardly from bottom 16 terminating in flange 14.

Side wall 12 has an outer surface 13 containing a recessed wedge-shaped cut-out or mating socket 18 that starts at the lower surface 17 of bottom 16 and continues upwardly, terminating in a shoulder 22 above the upper surface of bottom 16. Throughout the extent of bottom 16, the socket 18 provides a relatively rigid surface 26, while the surface 28 from the upper surface of bottom 16 to the shoulder 22 is relatively flexible. Located on inner surface 19 of side wall 12 is a semi-circular longitudinally shaped protrusion 20. Although protrusion 20 is shown situated on only two opposite walls of container 10, it is contemplated that any variation between a continuous or nub type shape protrusion may also be employed equally well, on the walls, flanges, or in the corners of the container, with suitable mating sockets or recesses 18 correspondingly located on the container to permit locking of similar containers together.

In operation, when two or more containers 10 and 10a are to be nested together as shown in FIGS. 3 and 3A, protrusions 20 on container 10 will be forced to snap over the rigid surface 26a into the flexible surface 28a of wall 12a. Since the dimension between the crest of protrusions on opposite sides 12 is less than the dimension between the opposite surfaces 18, actual locking of similar containers during nesting of the containers can only take place when an opposite pair of protrusions is forced into a mechanical override of the interference that exists on a pair of surfaces 18. The override takes place by deflecting wall 12. However, once protrusion 20 clears surface 26a wall 12 returns to normal by deforming the thinner surface 28a thus accomplishing the latching action. Separation of the nested containers has a similar snap action by reversing the steps described for nesting the containers.

Ribs 24 are provided contiguous with the bottom and side wall so the container to limit the extent to which the containers 10 and 10a can be forced together and easily and efficiently maintain a uniform spacing between flanges 14 of nested containers.

Since it is necessary to use a predetermined amount of force to cause separation of the containers, the container of the present invention in no way then depends upon gravity feed, while facilitating easy and efficient mechanical separation of containers. This eliminates the possibility of accidentally dispensing two containers at the same time. Non-uniform sticking, a problem in the prior art, is eliminated since a predetermined uniform force locking means is deliberately built into each individual container, facilitating mechanical separation, eliminating stack alignment problems, and preventing accidental dispensing of two or more containers at the same time. In addition, the locked stack of containers aids in the transfer of stacks from the shipping carton to the dispensing machine and from the machine stack storage area to the machine cup feed chute.

Container 10 is dimensioned such that opposite walls 12 may be easily grasped by the thumb and forefinger of a patient for removal of a lid or cover sealed around lip 14 over its open mouth to strip the cover therefrom. The container may then be used to administer the drugs contained therein by either removing the contents with the other hand or placing the container to the lips to propel the contents into the patient's mouth.

The container is also configured for ease of identification. For example, the top cover may be printed after filling and sealing with the patient's name, identification number, dose schedule, number of pills, etc. while a label may be applied to the bottom 16 of the container during filling and printed with the chemical and generic drug name, drug identification number, etc.

While I have shown and described specific embodiments of the present invention, it will, of course, be understood that other modifications and alternative constructions may be used without departing from the true spirit and scope of this invention. I therefore intend by the appended claims to cover all such modifications and alternative constructions as fall within their true spirit and scope.

What I intend to claim and secure by Letters Patent of the United States, is:

1. A stackable container having a continuous side wall having an inner surface and an outer surface, said side wall tapering downward from an open end to an integral bottom surface, said side wall containing locking means, whereby upon insertion of a second similar container into said container, the two containers will positively lock to each other with a predetermined amount of force, said locking means comprising a protrusion extending inwardly on the inner surface of said side wall, and a mating recess extending inwardly in the outer surface of said wall in close proximity to the bottom surface, said mating recess being a wedge-shaped cut-out from said side wall, starting at the bottom surface and continuing upwardly and inwardly into said side wall for a short distance, whereby upon insertion of a second similar container into said container, the protrusion on said container will be forced into the mating recess of said second similar container thereby positively locking the two containers together.

2. A stackable container as recited in claim 1 wherein the locking of the two containers is accomplished by the frictional engagement of the protrusion of said container with the mating recess of said second similar container.

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3. A stackable container as recited in claim 1 wherein the protrusion is semi-circular and longitudinal in shape having its axis parallel to said bottom surface.

4. A stackable container as recited in claim 1 further comprising a flange contiguous with and extending around the periphery of the open end of said side wall, said flange extending parallel to said bottom surface.

5. A stackable container as recited in claim 1 wherein said wedge-shape cut-out is defined by a lower relatively rigid wall section and an upper relatively flexible wall section, said lower wall section being coplaner

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with the bottom wall of said container and said upper wall section being of decreased thickness relative to the remainder of said side wall.

6. A stackable container as recited in claim 5 wherein two protrusions and two recesses are provided on opposite side walls of said container, and the transverse dimension between the crests of opposed protrusions is less than the transverse dimension between the outer surfaces of opposed recesses, to thereby provide said positive locking of the two containers together.

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