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(54) Stacked container array and method of forming same

(57) A stacked container array has at least a first and a second container each having a closure having a recess on which a portion of the other container is seated for nesting. The recess has a dimension that enables

the closed base of the other container and a portion of the upright standing side walls supporting the closed base to nest thereon with minimal translation movement.

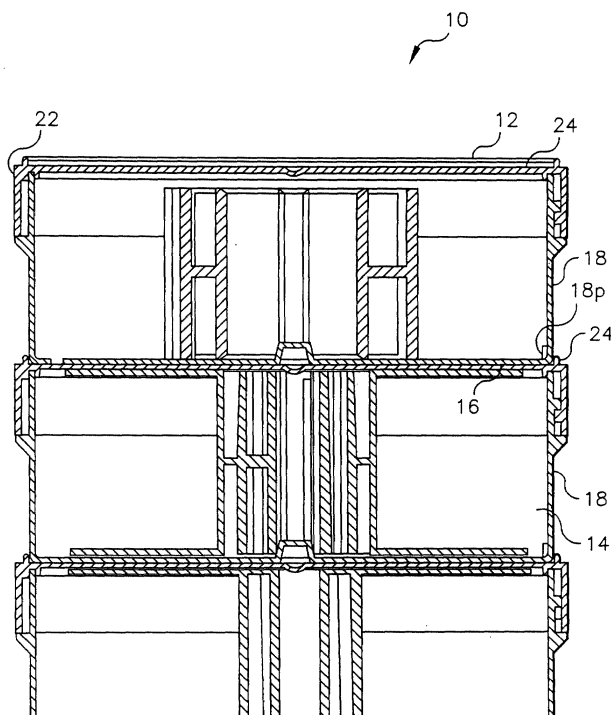


FIG. 1

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Description

[0001] The invention relates generally to the field of packaging, and in particular to packaging for long rolls of photosensitive web material. More specifically, the invention relates to a container with a nesting feature allowing the stacking of multiple containers.

[0002] Typically, long rolls of photosensitive web material, e.g., photographic film used for surveillance, social/portrait, and commercial imaging, are commonly packaged in containers ensuring light tightness during shipment from the manufacturer to the film processor. The width of the photosensitive web used for such applications is typically 35mm, 46mm, 70mm or 105mm. Rolls of photographic film are generally wound onto cores with or without light protecting flanges. Light-tight containers suitable for storing and shipping photosensitive film have a film compartment and a closure adapted to fit rather snugly about the film compartment. Most often, the containers are fabricated of metal or plastic materials.

[0003] After using the film, the photographer generally stores it in the light-tight container and then sends the film to a photoprocessing lab where it is developed. As a general practice, technicians at the photoprocessing lab will carry several stacked containers containing exposed film into a dark room to open the containers and prepare the film for processing. While existing containers for storing and transporting rolls of photographic film are stackable, the containers do not have nesting features. Hence, it is not uncommon for technicians to accidentally drop containers onto the floor, as the stack is unstable. Such accidents are known to result in damaged film reels, possible damage to the exposed film, and unnecessary exposure to liability to the photoprocessing lab.

[0004] It should be appreciated that due to the different widths of film, film containers must be available to accommodate the several different sizes. It would, therefore, be advantageous for the manufacturer to be able to utilize a single common container closure with different sizes of container bottoms. Such an advantage is identified in U.S. Patent No. 5,740,914, by Herzog, Apr. 21, 1998, titled, "Closure For Stacking Containers Of Different Sizes." However, unlike the containers described in U.S. Patent No. 5,740,914, the plastic or metal containers used for photographic film require an angle on the external wall of the container bottom typically identified as draft angle for ejection from the forming device. Thus, as the depth of the container bottom changes to accommodate the different widths of film, the bottom diameter of the container bottom would become smaller if each size of container bottom had the same draft angle.

[0005] It should be appreciated, therefore, that existing packaging containers for photosensitive film product have numerous shortcomings. For instance, as multiple containers are stacked, they become unstable, and dif-

ferent size container closures are required for different widths of film.

[0006] Therefore, a need persists for stackable packaging containers for photosensitive film product that incorporates nesting features to stabilize the stacked array of multiple containers and is cost effective to produce.

[0007] It is, therefore, an object of the invention to provide a stackable container array that permits stacking of two or more containers.

[0008] It is another object of the invention to provide a stackable container array that secures the containers in a stacked array.

[0009] Yet another object of the invention is to provide a method of facilitating the stacking of one container about another in a stacked container array.

[0010] It is, therefore, a feature of the stacked container array that a closure of either of the containers in the stacked array has a recess for receiving the closed base of another container in the stacked array.

[0011] The present invention is directed to overcoming one or more of the problems set forth above. Briefly summarized, according to one aspect of the present invention, a stacked container array comprises a first container and at least a second container. The first container and second container each has an interior compartment comprising a closed base, upright standing side walls surrounding the closed base, and an opening formed by the side walls opposite the closed base for accessing the interior compartment. A closure for closing the opening includes a recess having an upwardly extending outer wall structure at least partially surrounding the recess. The recess has a diameter for receiving both the closed base and a portion of the upstanding side walls of the container. The outer wall structure or stacking rib eliminates translation movement of the container seated on the recess.

[0012] In another aspect of the invention, a method of forming a stacked container array comprises the steps of providing the containers described above each being fitted with a closure as described. The closed base of either of the first and second containers is then stacked onto the recess of the closure of the other of the first and second containers thereby forming a stacked array.

[0013] The present invention has the following advantages: the containers comprising the stacked array are easier to stack; the containers have limited translation movement in the stacked array; the container base and closure can be easily adapted to various sizes and configurations.

[0014] The above and other objects, features, and advantages of the present invention will become more apparent when taken in conjunction with the following description and drawings wherein identical reference numerals have been used, where possible, to designate identical features that are common to the figures, and wherein:

Fig. 1 is a cross section view of a stacked container array;

Fig. 2 is a perspective view of either of the containers in the stacked array; and,

Fig. 3 is a perspective view of a closure for the container in Figure 2.

[0015] Turning now to the drawings, and in particular to Figs. 1 - 3, the stacked container array 10 of the invention is illustrated. Such a stacked container array 10 may contain, for instance, rolls of photosensitive web material (e.g., film) which require storage and shipment in light-tight containers. The inventors have developed a design for multiple-sized light-tight containers that can be nested and, therefore, solve the problem with existing containers for film product. The invention includes a variable taper (as described below) on the stacked containers 12, 14 to facilitate nesting.

[0016] Referring to Figs. 1 and 2, broadly defined, stacked container array 10 includes a first container 12 and at least a second container 14 for stacking with the first container 12. It should be apparent that any number of containers 12, 14 of the invention can be safely stacked in the container array 10. According to Fig. 2, more particularly, first container 12 and at least second container 14 each includes a closed base 16 and upright standing side walls 18 surrounding closed base 16 forming a container body. Preferably, closed base 16 is generally planar for more stable stacking although it need not be. An opening 20 opposite the closed base 16 provides access to an interior compartment for storing articles therein such as a roll of photographic film. Preferably first and second containers 12, 14 are generally circular although other geometric shapes may be used, such as any generally polygonal shape.

[0017] Referring to Fig. 3, a generally circular closure 22 is provided for closing the opening 20. A plurality of cooperating threads 27 arranged both in the interior of the closure 22 and about the circumference of the first and second containers 12, 14 provide means for fastening the closure 22 to a respective container 12, 14. Skill artisans will appreciate that other fastening means may be used such as a snug friction fit. In the preferred embodiment, closure 22 has a generally circular shape and is configured to conform to the shape of either of the first and second containers 12, 14. Further, closure 22 includes a recess 24 and an upwardly extending outer wall (or stacking rib) 26 at least partially surrounding the recess 24. In the preferred embodiment, recess 24 has a generally planar surface and an interior diameter for receiving both the closed base 16 and a portion 18_p of the upstanding side walls 18 surrounding the closed base 16 of the other of the first container and second container.

[0018] Moreover, in the preferred embodiment, the upright standing side walls 18 of closure 22 form a slight acute angle to the closed base 16 although the sidewalls 18 may very well be oriented at a right angle to the

closed base 16. The advantages of the acute angle orientation or variable taper is that it enables the containers 12, 14 to be easily stacked and removed from the stacked array. Further, the variable taper with each size container tends to facilitate nesting, so that the diameter of the closed base 16 is similar but independent of depth. The stacked container array 10 of the invention is thereby formed.

[0019] In the preferred embodiment, recess 24 is formed by a bead of molten resin during the injection molding process protruding from the closure 22 at least partially forming the upwardly extending outer wall 26 or stacking rib. This stacking rib limits translation movement of the closed base 16 seated in the recess 24. Preferably, the outer wall 26 or stacking rib extends continuously around the circumference of recess 24 (shown in Fig. 3). Alternatively, outer wall 26 may include minimally three wall stacking rib portions (not shown) that are arranged along the circumference of the recess 24 to limit translation movement of the closed base 16 seated thereon.

[0020] Preferably first and second containers 12, 14 are made of a rigid thermoplastic material, such as high-density polyethylene. Those skilled in the art will appreciate that other materials may be used with equal results including polystyrene and polypropylene.

Claims

1. A stacked container array, comprising:
a first container and at least a second container for stacking with said first container, said first container and said at least second container each including a closed base, upright standing side walls surrounding said closed base, an opening formed by said upright standing side walls opposite said closed base and a closure for closing said opening; wherein said closure of either of said first container and said at least a second container includes a recess having an upwardly extending outer wall at least partially surrounding said recess, said recess having an interior dimension for receiving both the closed base and a portion of the upstanding side walls surrounding said closed base of the other of said first container and said at least second container thereby forming a stacked container array.
2. The stacked container array recited in claim 1 wherein said recess in either of said first and second closures is formed by a bead protruding from said closure, said bead at least partially forming a boundary wall for limiting translation movement of said closed base seated in said recess.
3. The stacked container array recited in claim 1 wherein said recess has a generally planar surface and said closed base is generally flat.

4. The stacked container array recited in claim 1 wherein said upwardly extending outer wall fully surrounds said recess.
5. A stacked container array recited in claim 1 wherein said upright standing side walls surrounding said closed base is oriented at a slight acute angle to said base. 5
6. The stacked container array recited in claim 1 wherein said first and at least second containers and respective closures each has a plurality of cooperating threads for securing said respective closure to a respective container. 10
7. A method of stacking containers in a stacked array, comprising the steps of: 15
- providing at least a first and second container each including a closed base, upright standing side walls surrounding said closed base, an opening formed by said side walls opposite said closed base and a closure fitted about said sidewalls for closing said opening; wherein said closure of either of said first container and said at least a second container includes a recess having an upwardly extending outer wall at least partially surrounding said recess, said recess having an interior dimension for receiving both the closed base and a portion of the up- standing side walls surrounding said closed base of the other of said first container and said at least second container; and, 20
- stacking the closed base of either of said first and second containers on the recess of the closure of the other of said first and second containers thereby forming a stacked array. 25
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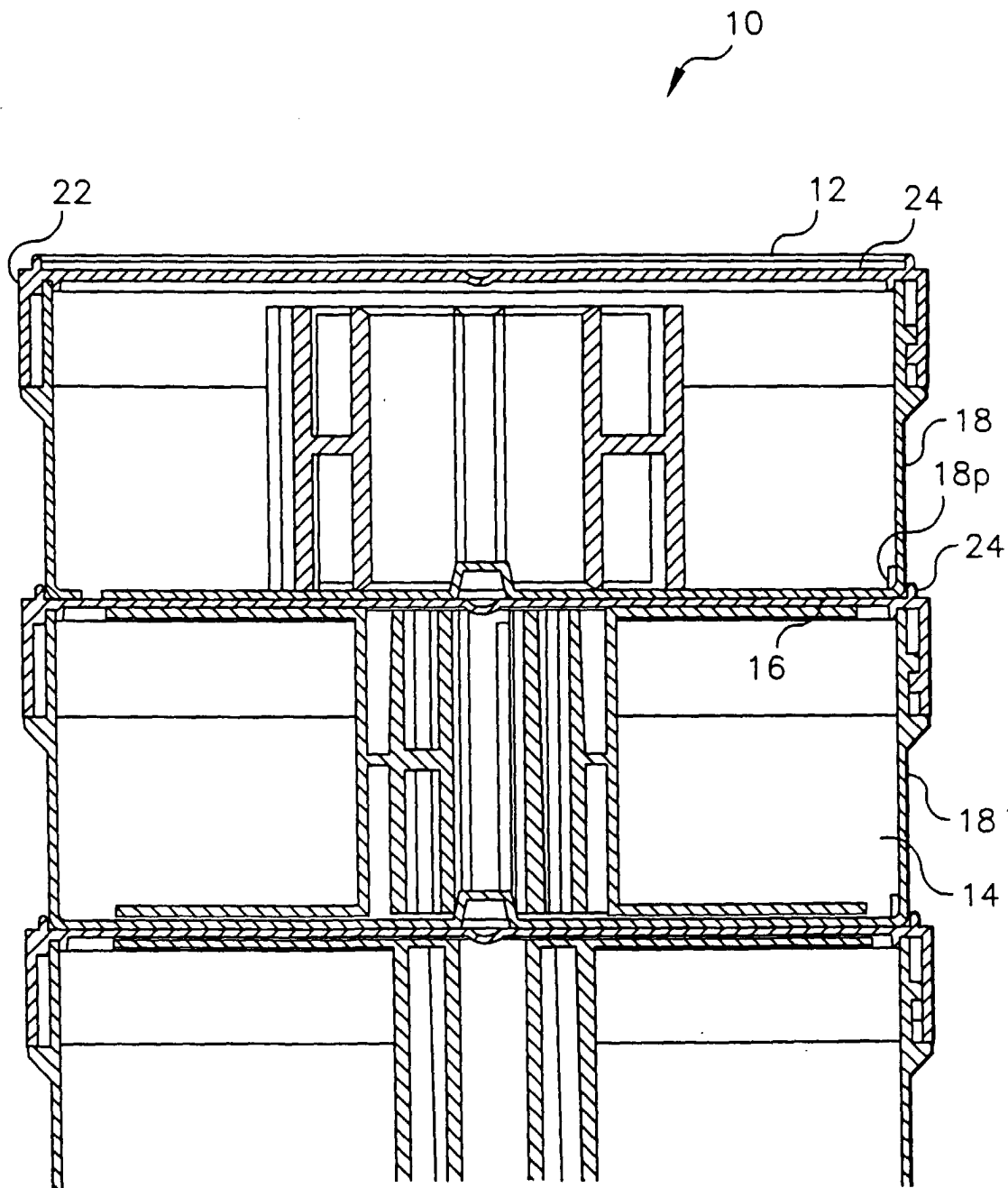


FIG. 1

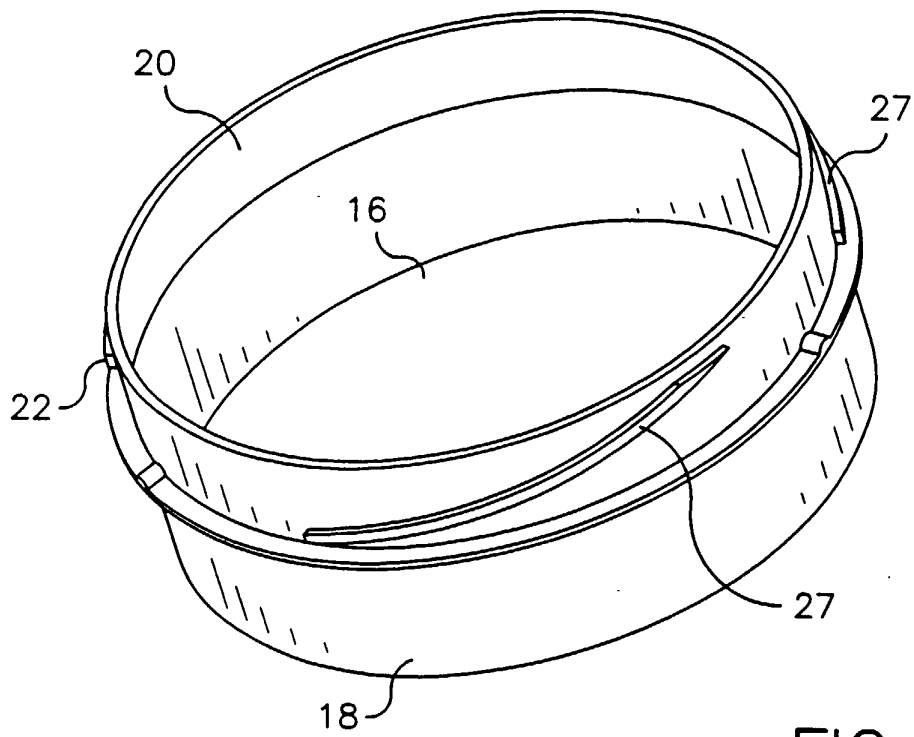


FIG. 2

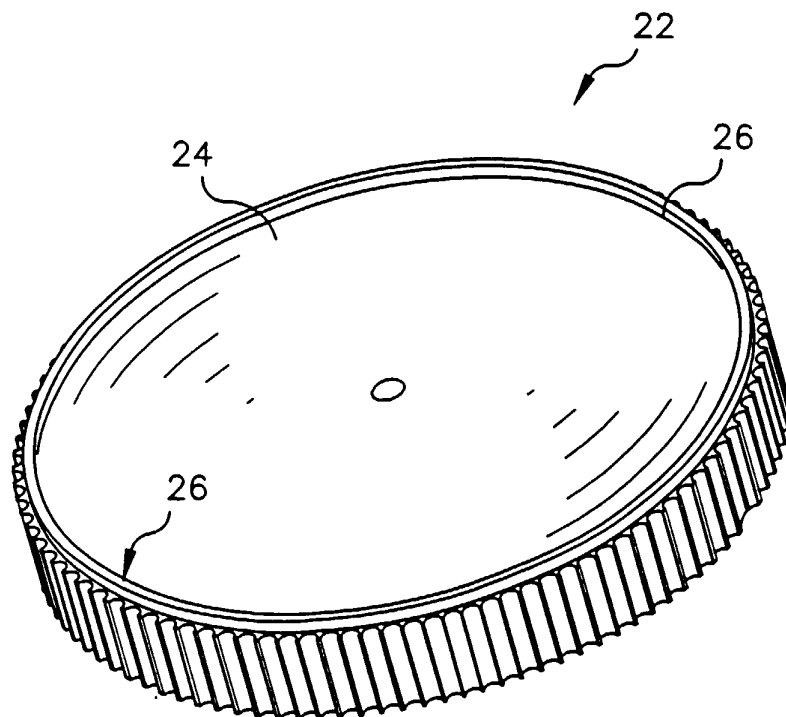


FIG. 3