

CONTAINER AND CHILD-RESISTANT CLOSURE SYSTEM

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a container and child-resistant closure system intended for use with pharmaceuticals or other products which if improperly used pose a threat of injury or death.

[0002] Numerous designs exist within the prior art for child-resistant container closure systems. A particularly popular class of child-resistant closures are the so-called "squeeze and turn" closures, wherein a container cap must be manually deformed to release the cap from the container. As an example, U.S. Pat. No. 4,134,513 discloses a squeeze and turn cap which is compressed along a diameter to deform the cap and release it from the container. A first drawback associated with the prior art is that the degree of deformation required to release the cap is often significant, posing a substantial physical challenge, especially to persons with impaired hand strength. A second common drawback of the prior art is that the cap and container designs are frequently quite intricate, resulting in high manufacturing costs.

BRIEF SUMMARY OF THE INVENTION

[0003] According to a first aspect of the invention, a combination container and child-resistant closure system is disclosed. The system comprises a cap including a top having an outer circumference, the cap further including a first skirt depending from the outer circumference of the top and having a pair of opposing protrusions disposed on an interior surface, the protrusions being aligned along a first axis, and a pair of opposing finger pads on an exterior surface, the finger pads being aligned along a second axis which is generally perpendicular to the first axis. The cap further includes a second skirt depending from the top and disposed within and spaced from the first skirt, the second skirt having a threaded interior surface. The system also comprises a container including a neck forming an opening of the container, the neck having a threaded exterior surface and a collar at a base of the neck, the collar being generally elliptical in shape, an outer edge of the collar generally defining major and minor axes, a pair of opposing inwardly extending notches located generally at the apses of the major axis of the ellipse, each notch having a base wall and two side walls, said two side walls extending generally perpendicularly from the base wall. When the cap is threaded onto the neck by rotation of the cap relative to the container in a first direction, the cap advances onto the container neck until the protrusions are positioned within the collar notches, locking the cap onto the container and preventing further substantial rotation of the cap relative to the container in either the first or a second direction. A user may press inwardly on the pair of opposing finger pads, thereby deflecting the protrusions out of engagement with the notches, allowing the cap to be rotated in the second direction and removed from the container.

[0004] According to a second aspect of the invention, a child-resistant cap for a container having a neck forming an opening of a container is disclosed. The container neck has a threaded exterior surface and a collar at a base of the neck, the collar being generally elliptical in shape. An outer edge

of the collar generally defines major and minor axes. The collar further includes a pair of opposing inwardly extending notches located generally at the apses of the major axis of the ellipse, each notch having a base wall and two side walls, the two side walls extending generally perpendicularly from the base. The child-resistant cap comprises a top having an outer circumference, a first skirt depending from the outer circumference of the top and having a pair of opposing protrusions disposed on an interior surface, the pair of protrusions being aligned along a first axis, and a pair of opposing finger pads on an exterior surface, the finger pads being aligned along a second axis which is generally perpendicular to the first axis. A second skirt depends from the top and is disposed within and spaced from the first skirt, the second skirt having a threaded interior surface. When the cap is threaded onto the neck by rotation of the cap relative to the container in a first direction, the cap advances onto the container neck until the protrusions are positioned within the collar notches, locking the cap onto the container and preventing further substantial rotation of the cap relative to the container in either the first or a second direction. A user may press inwardly on the pair of opposing finger pads, thereby deflecting the protrusions out of engagement with the notches, allowing the cap to be rotated in the second direction and removed from the container.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0005] The foregoing summary, as well as the following detailed description of preferred embodiments of the invention, will be better understood when read in conjunction with the appended drawings. For the purpose of illustrating the invention, there is shown in the drawings embodiments which are presently preferred. It should be understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown. In the drawings:

[0006] FIG. 1 is an exploded, elevational view in central section of the dispensing end of a container and a child-resistant cap in accordance with a preferred embodiment of the present invention;

[0007] FIG. 2 is an elevational view in central section of the container and cap of FIG. 1 shown in an assembled and locked configuration;

[0008] FIG. 3 is a sectional view taken along sectional plane 3-3 in FIG. 2;

[0009] FIG. 4 is a sectional view similar to that of FIG. 3, showing the deformation of the cap resulting from compressing the outer skirt of the cap as indicated by the arrows;

[0010] FIG. 5 is a sectional view similar to that of FIG. 3, showing the cap rotated in the direction of the arrows out of engagement with the container; and

[0011] FIG. 6 is a detail view showing a locking feature of the cap.

DETAILED DESCRIPTION OF THE INVENTION

[0012] Certain terminology is used in the following description for convenience only and is not limiting. The words "right", "left", "top", and "bottom" designate directions in the drawings to which reference is made. The words