April 28, 1964 R. D. CHANCELLOR 3,130,848

BOTTLE CAP WITH INTERRUPTED THREADS

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FIG_1

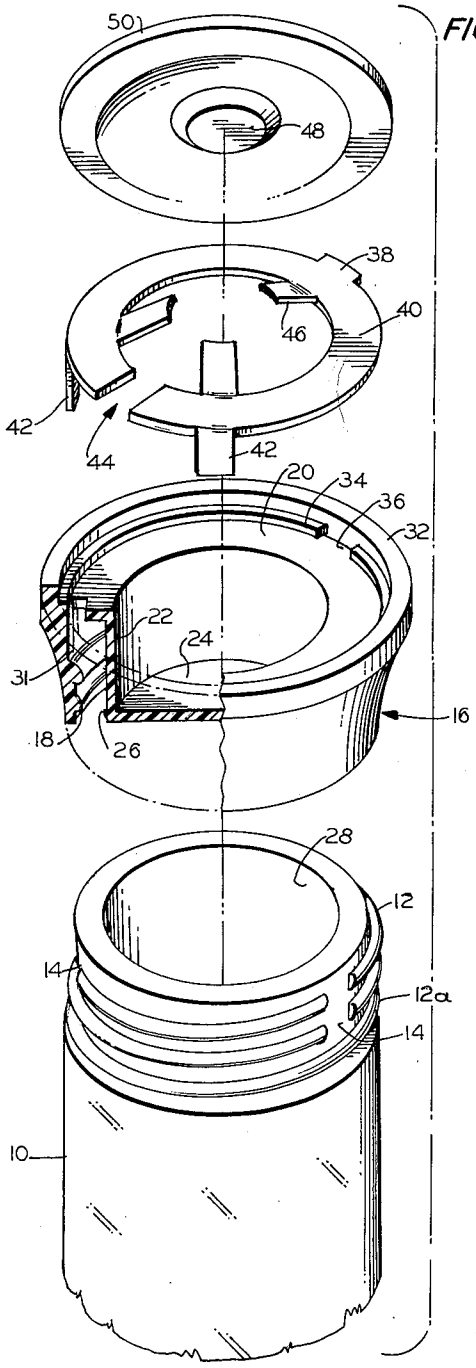


FIG_2

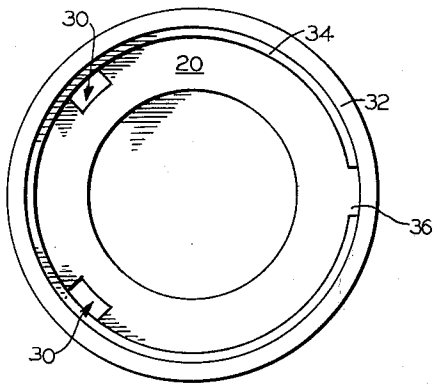


FIG_3

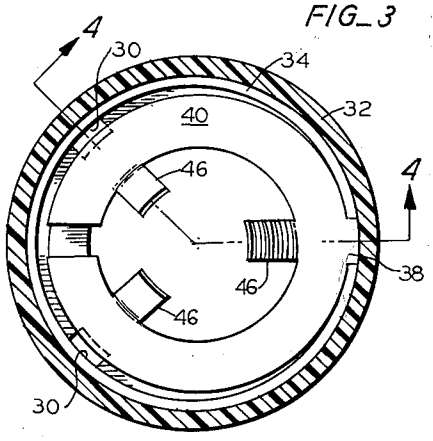
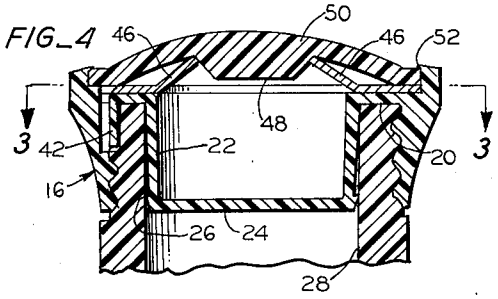


FIG_4



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FIG_5

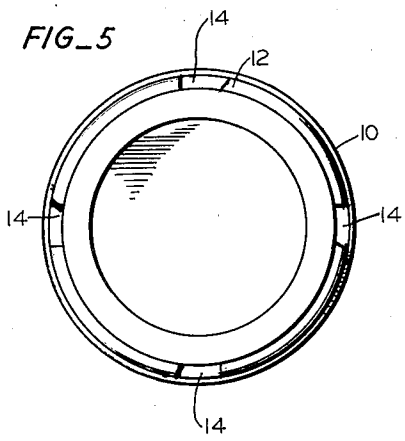


FIG_6

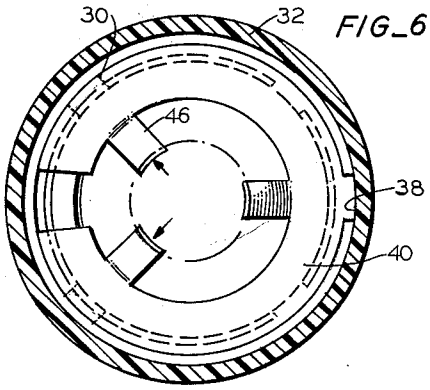


FIG_7

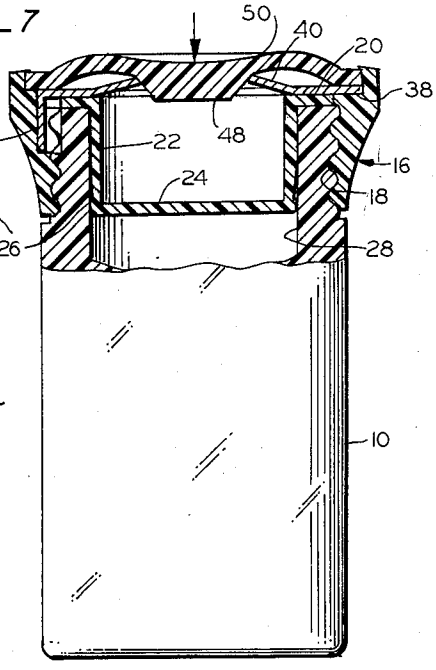
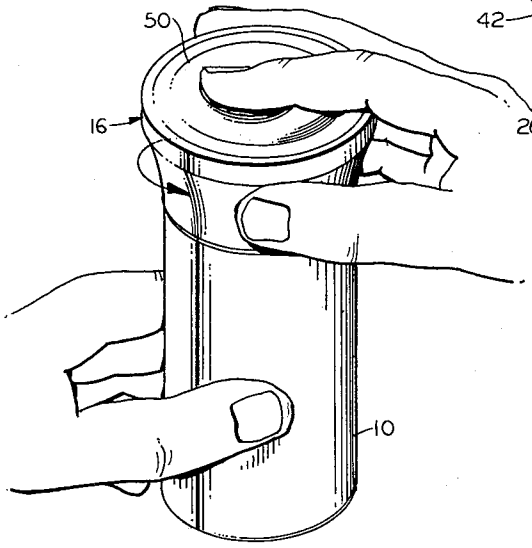


FIG_8



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BOTTLE CAP WITH INTERRUPTED THREADS

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4 Claims. (Cl. 215—9)

This invention relates to a bottle or jar having a safety closure and more particularly to such a structure requiring, to open, manipulations which are difficult for small children.

It is an object of this invention provide a bottle or jar having a safety closure, all parts of which may be made of relatively inexpensive plastic material, if desired.

It is a further object of this invention to provide a safety closure for a bottle, jar or other container which is relatively easily manipulated by adults but sufficiently difficult for a small child that medicines, corrosive substances and poisons may be placed therein with relative safety.

Other objects and advantages of this invention, if not specifically set forth, will become apparent during the course of the description which follows.

In the drawings:

FIGURE 1 is an exploded view, partially in section, of the jar and closure of this invention.

FIGURE 2 is a plan view of the portion of the closure assembly which is second from the bottom in FIGURE 1.

FIGURE 3 is a sectional view through line 3—3 of FIGURE 4.

FIGURE 4 is a sectional side of elevation of the assembled structure of this invention taken through the line 4—4 of FIGURE 3.

FIGURE 5 is a plan view of the jar shown at the bottom of FIGURE 1 with the top assembly removed.

FIGURE 6 is a view similar to FIGURE 3 but showing the effect of depressing the deformable top.

FIGURE 7 is a side elevation, partially in section and similar to FIGURE 4 showing the effect of depressing the deformable top.

FIGURE 8 is a perspective view on a somewhat reduced scale showing the manipulations required to open the container.

Generally, this invention comprises a bottle, jar or other container having a top consisting of parts which may be partially or entirely made of inexpensive flexible plastic materials and which is so constructed that it is necessary to depress the center of the top with one finger in order to unlock the top and permit it to be unscrewed from the container.

Referring now to the drawings wherein like characters refer to like parts throughout, there is shown a container 10 which, as seen in FIGURE 1, has helical threads 12 which are interrupted at least once at 14 and preferably at two or more places. For sealing purposes, the lowermost of the threads should be continuous as at 12*a*.

The main portion of the closure consists of a collar, generally 16, which is internally threaded at 18. These threads register with the exterior threads 12 and 12*a* of the container. Integral horizontal ring 20 has depending therefrom the generally cylindrical member 22 which has integral therewith and at right angles thereto the closure disc 24. As seen in FIGURES 1, 4 and 7, the lowermost edge of the cylindrical member 22 terminates in a sealing lip 26 which tightly engages the internal walls 28 of the container 10.

The ring 20 has at least one and preferably several holes 30 therethrough and a rectangular recess 31 is formed in the main body of collar 16 directly beneath each hole 30. Each recess is formed by interrupting internal threads 18. If there is more than one, as shown in FIGURE 2, they should be spaced to coincide with the areas of the interruptions 14 in the threads 12. Integral with the exterior-most portion of the ring 20 and with the upstanding rim 32 of the collar 16 is the circular shoulder 34 having an interruption 36 which serves as a notch for the receipt of the tongue 38 on the ring 40. The ring also has at least one and preferably two or more depending tongues 42 which are proportioned to register with the holes 30 in horizontal flange 20 and to fit between the facing shoulders which form the interruptions 14 of the threads 12 as well as in the recesses 31 formed by the interruptions in the threads 18. The ring 40 is split at 44 so as to permit expansion and contraction and has at least two opposed inwardly extending tongues 46. These are curved at their lead edges and form segments of a circle which engage with the downwardly depending boss 48 on the flexible top member 50. The circular lip 52 on the inner edge of the rim 32 of the closure member 16 grips the periphery of the top 50 to secure it in place. Hence, the elements 50, 40, and 16, while shown in an exploded form in FIGURE 1, form a unitary closure member when assembled.

In use, the three parts 50, 40 and 16 of the closure are assembled as shown in FIGURE 4 with the tongues 42 extending into the holes 30 and the tongue 38 gripped in the notch 36 of the shoulder 34. The tongues 42, when the ring 40 is in its normally constricted or relaxed position (FIGURE 4), tend to lie flush against the walls of the container 10. When the cover is in place upon the container 10 and the top properly oriented relative to the container, the tongues 42 will rest between the shoulders on either side of the interruptions 14 of the threads 12. Because the tongue 38 permits no relative rotation between ring 40 and the collar 16, the entire closure will thus be locked to the container 10. When the flexible plastic forming the top 50 is depressed as shown in FIGURE 7, the ring 40 will be expanded and tongues 46 will be forced outwardly into the recesses 31. FIGURE 6 shows the direction of application of force when the center of the top 50 is depressed. The entire assembly comprising units 16, 40 and 50 is thus released by withdrawal of tongues 42 from the interruptions 14 and may be turned and removed from the container.

Because removal of the cover requires a simultaneous application of force at the center of the deformable top 50 and application of a turning moment to the cover while the container 10 is held against rotation, it will be appreciated that removal of the cover by small children is difficult and the container is thus especially suitable for use with medicines, poisons, corrosive materials, etc.

The structure shown has two sealing features, one resulting from tight contact between the underside of the ring 20 and the upper surface of the jar or container while further assurance against leakage is provided by the complete thread 12*a* which seals tightly with one of the internal threads 18 of collar member 16.

In FIGURE 5, a modification permitting the cover to be re-applied to the container 10 without depressing the centermost portion of the top 50 is seen. That is, assuming that the top is to be applied by clockwise rotation of the cover assembly to the container 10 shown in FIGURE 5, it will be appreciated that the sloping shoulders shown in this figure will permit the tongues 42 to ride up over them so as not to interfere with clockwise rotation of the cap relative to the container 10.

Obviously, many modifications and variations may be made without departing from the spirit and scope of this invention, and therefore only such limitations should be imposed as are indicated in the appended claims.

I claim:

1. A container and safety closure therefor including in combination:

(*a*) a container having a cylindrical neck at the open end thereof;

(*b*) integral threads molded in the cylindrical neck, said threads having at least a single interruption therein whereby to form at least a single notch having shoulders formed by said thread at either side thereof;

(*c*) a cover thereon including a collar having internal threads mating with the threads on the neck of the said container;

(*d*) a tongue secured against rotation relative to said cover and extending downwardly therefrom to engage the said notch formed by the said interruptions in the said threads of the container neck, said tongue being normally urged inwardly toward the said threads of the said container;

(*e*) and means for urging said tongue outwardly from said notch formed by the said interruption, said means including a deformable topmost portion on the said cover and means for translating vertical motion of said topmost portion into radial motion of the said tongue.

2. A container and safety closure therefor including in combination:

(*a*) a container having a cylindrical neck at the open end thereof;

(*b*) integral threads molded in the cylindrical neck, said threads having at least a single interruption therein whereby to form at least a single notch having shoulders formed by said thread at either side thereof;

(*c*) a cover thereon including a collar having internal threads mating with the threads on the neck of the said container;

(*d*) a split ring of resilient material positioned on the underside of said cover, said split ring having at least a single downwardly depending tongue positioned to engage the said notch formed by the said interruptions in the said threads of the container neck, said tongue being normally urged inwardly toward the said threads of the said container when said ring is in a relaxed position;

(*e*) and means for urging said tongue outwardly from said notch formed by said interruptions, said means including a deformable topmost portion on the said cover and means for translating vertical motion of said topmost portion into radial motion of the said tongue by applying pressure to the internal circumference of said ring.

3. A container and safety closure therefor including in combination:

(*a*) a container having a cylindrical neck at the open end thereof;

(*b*) integral threads molded in the cylindrical neck, said threads having at least a single interruption therein whereby to form at least a single notch having shoulders formed by said thread at either side thereof;

(*c*) a cover thereon including a collar having internal threads mating with the threads on the neck of the said container;

(*d*) a split ring secured against rotation relative to said cover and having a tongue depending therefrom extending downwardly to engage the said notch formed by said interruptions in the said threads of the said container neck, said tongue being normally urged inwardly toward the said threads of the said container when the said resilient ring is in a relaxed position;

(*e*) and means for urging said tongue outwardly from said notch formed by said interruptions, said means including a deformable topmost portion on the said cover and a boss on the underside of said cover and integral therewith, said split ring having tongues extending upwardly therefrom at an angle relative to the said ring and contacting the said boss whereby when the said deformable topmost portion of the said cover is depressed, vertical motion of the said boss will cause the said tongues to assume an orientation whereby pressure is applied to the said split ring and the said ring is expanded thereby moving the tongue depending from the said ring from the said notch formed by the said interruptions in the said threads of the container neck.

4. A container and safety closure therefor including in combination:

(*a*) a container having a cylindrical neck at the open end thereof;

(*b*) integral threads molded in the cylindrical neck, said threads having at least a single interruption therein whereby to form at least a single notch having shoulders formed by said thread at either side thereof, one of said shoulders being approximately a right-angle shoulder and one of said shoulders being an obtuse-angle shoulder;

(*c*) a cover thereon including a collar having internal threads mating with the threads on the neck of the said container;

(*d*) a tongue secured against rotation relative to said cover and extending downwardly therefrom to engage the said notch formed by the said interruptions in the said threads of the container neck, said tongue being normally urged inwardly toward the said threads of the said container;

(*e*) and means for urging said tongue outwardly from said notch formed by the said interruption, said means including a deformable topmost portion on the said cover and means for translating vertical motion of said topmost portion into radial motion of the said tongue.

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