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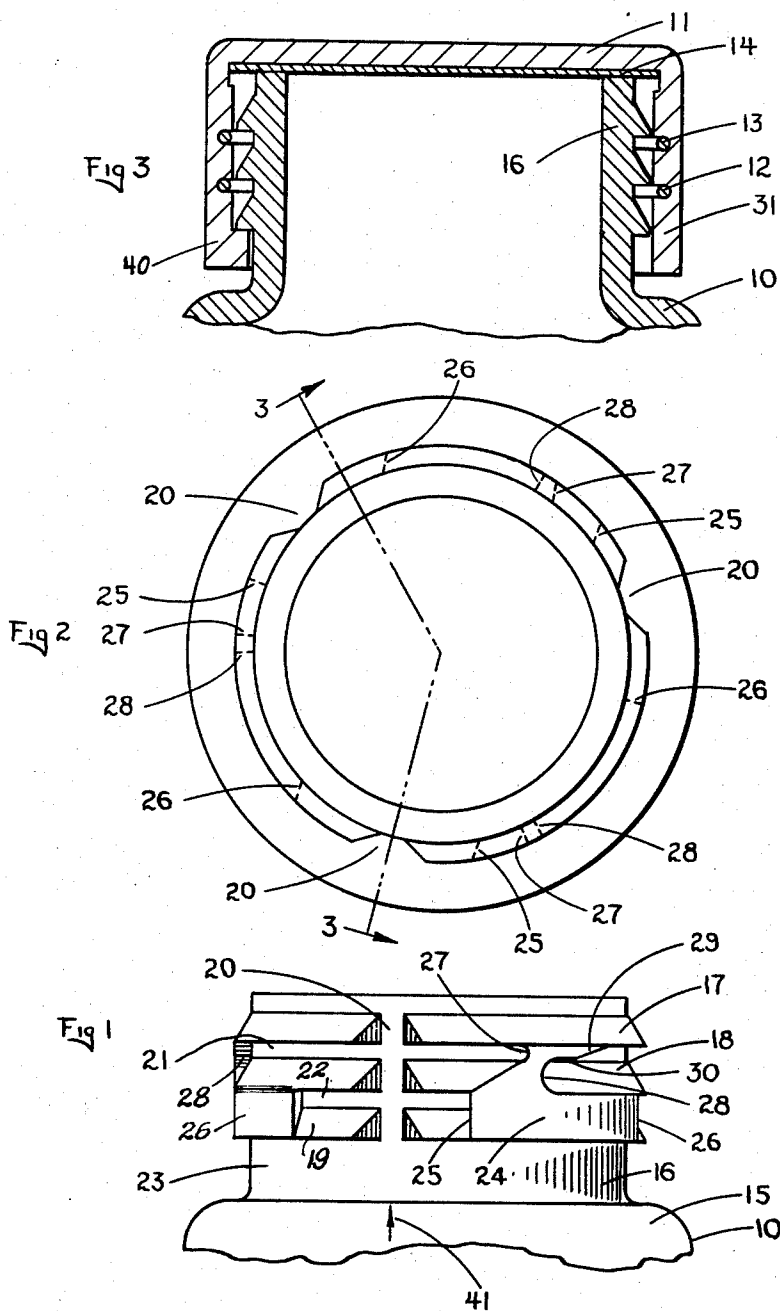
D. A. HAYNES

2,947,431

LOCK FOR CONTAINER COVERS

Filed April 6, 1959

2 Sheets-Sheet 1



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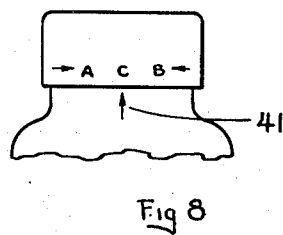
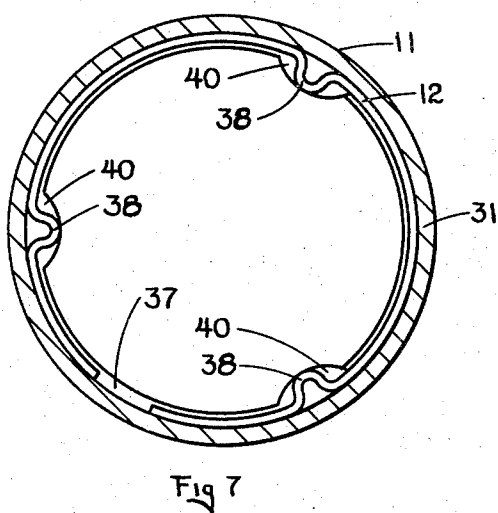
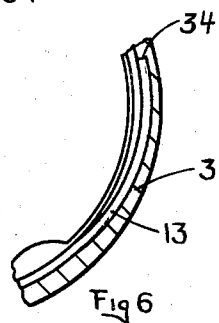
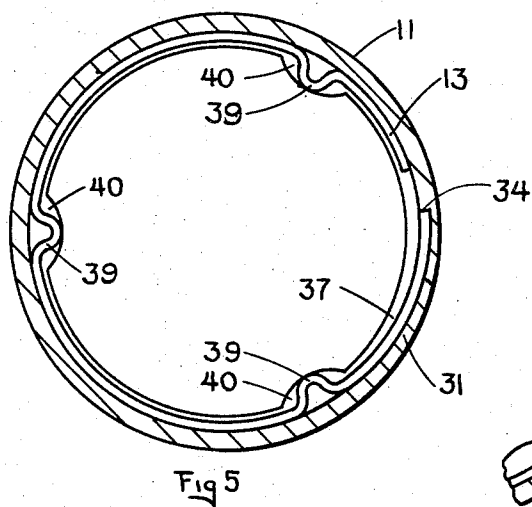
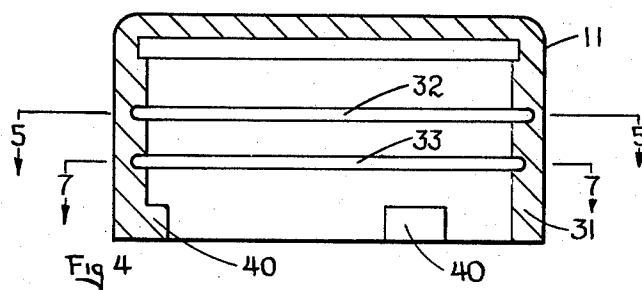
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LOCK FOR CONTAINER COVERS

Filed April 6, 1959

2 Sheets-Sheet 2



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LOCK FOR CONTAINER COVERS

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5 Claims. (Cl. 215—9)

This invention relates to locks of the combination type for container covers, whereby to remove the cover from the container it is necessary to rotate the cover in opposite directions to predetermined positions.

The present invention is an improvement upon that disclosed in my prior application, Serial No. 751,246, filed July 28, 1958. The invention is intended primarily to prevent the accidental opening of containers such as bottles and jars containing poisons or harmful drugs and the like. A very common occurrence is that of a young child opening a bottle containing some harmful substance and swallowing the contents. Adults occasionally mistake a container of some harmful substance for one which is not, by failing to read the label. The present invention completely prevents a person unable to read, such as a young child from opening the container. It also prevents an adult from accidentally opening the container by making it somewhat difficult to open and requiring him to read the directions for opening it, which may be given somewhere on the container or cover.

The invention also provides a tight seal between the container and the cover so as to prevent leakage of the contents, if in liquid form, by providing means for pulling the cover down onto the container much as in the manner of the ordinary screw-on cover.

These results are obtained by means of a novel form of container neck, and a novel cover, together with one or more resilient locking rings which require that the cover be rotated back and forth to predetermined positions before the cover can be removed. Also, means is provided for screwing, or camming the cover onto the container tightly enough to prevent leakage of the contents.

In the drawings:

Figure 1 is a fragmentary elevational view of a container embodying my invention;

Figure 2 is a top plan view of the container shown in Figure 1;

Figure 3 is a fragmentary cross-sectional view of the container and cover with the cover on the container, said view being taken on substantially the line 3—3 of Figure 2 and looking in the direction of the arrows;

Figure 4 is a cross-sectional view of the cover without the rings;

Figure 5 is a cross-sectional view taken on substantially the line 5—5 of Figure 4, but showing the locking rings in place and looking in the direction of the arrows;

Figure 6 is a fragmentary cross-sectional view similar to Figure 5 showing one locking ring in driving position;

Figure 7 is a cross-sectional view taken on substantially the line 7—7 of Figure 4 but showing the locking rings in place and looking in the direction of the arrows; and

Figure 8 is a fragmentary elevational view of the container and cover showing the indicia of the combination lock.

Referring now to the drawings in more detail, the parts of the container cover lock assembly consist of a

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container 10, a cover 11, two locking rings 12 and 13, and a seal 14.

The container may be fashioned from any suitable material such as glass or plastic. It has a body portion 15 having an opening therein surrounded by an annular wall or neck 16. Partially surrounding the wall 16 are ribs 17, 18 and 19 extending in a circumferential direction and forming grooves 21 and 22 between them, and also a groove 23 below the rib 19.

The ribs are interrupted in a plurality of places to form groups of registering gaps 20 extending through the ribs. Preferably there are three of these groups of gaps. (See Figure 2.) The grooves 21 and 22 are also interrupted at spaced apart intervals between each group of gaps by lands 24, which define a segment of a cylindrical surface flush with the outer periphery of the ribs 17, 18 and 19, and shaped as shown in Figure 1. These lands form stops 25 and 26 between ribs 18 and 19, and stops 27 and 28 between ribs 17 and 18.

The lower surface of rib 17 also has a downwardly inclined helical portion 29 ending in a horizontal portion 30 adjacent to the stop 28.

The cover 11 has an annular wall surrounding the neck of the container. Formed in the interior of the wall 31 are two circumferential grooves 32 and 33. The groove 33 is circular, while groove 32 is somewhat of a spiral so as to form a shoulder 34.

Seated in the grooves 32 and 33 are two resilient rings 12 and 13. Preferably both rings are identical. These rings are not complete circles but are broken or interrupted at 37 for two reasons; one being so that the rings can be rotated by the cover in one direction, and the other so that the rings can be easily snapped into the grooves 32 and 33. The rings 12 and 13 have radially inwardly bent detents 38 and 39 respectively, equal in number to the gaps 20 in the ribs on the container neck. Also they are of such dimensions that they will pass through the gaps when in registry therewith.

The annular wall of the cover is also provided at its lower edge with inwardly extending lugs 40, equal in number and in spacing to the gaps 20 on the container neck 16. They are of such dimensions that they will pass through the gaps 20 when in registry therewith.

On the outside of the container near the cover is an index mark, such as an arrow 41. (See Figure 8.) On the cover are three index marks such as the letters A, B and C. These are located in such relation to the lugs 40 on the cover and the stops 25, 26, 27 and 28 on the container that when the cover is rotated first to A, then to B, and finally to C, the lugs 40 and detents 38 and 39 can be registered with each other and the gaps 20 so that the cover can be removed.

The rings 12 and 13 are placed in their respective grooves in the cover and the detents 38 and 39 are registered axially with the fixed lugs 40 on the cover 11. The cover may then be placed on the container by moving the cover axially onto the neck on the container, with the detents 38 and 39 and lugs 40 passing through the gaps 20. This position of the cover relative to the container is indicated by registering the letter C on the cover with index mark 41 on the container and pushing the cover onto the container until the lugs 40 are in groove 23, detents 38 are in groove 22 and detents 39 are located in groove 21. The cover may then be rotated either in a clockwise or in a counter-clockwise direction. There is sufficient frictional resistance between the rings 12 and 13 and the cover to cause the rings to rotate with the cover until prevented from further rotation by the stops on the container neck. If rotated clockwise, detents 38 first strike stops 26. Continued rotation of the cover moves lugs 40 and detents 39 out of registry with detents 38. Presently detents 39 engage the heli-

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cal portions 29 on the container neck which temporarily stops rotation of ring 13 until one end is picked up by shoulder 34 in groove 32 in the cover. Continued clockwise rotation of the cover drives detents 39 down under the helical portions 29 and under the horizontal portions 30 until the detents 39 strike stops 28 in grooves 21, whereby further rotation is prevented. The force exerted by the helical portions 29 on the detents 39 pulls the cover down onto the container and forms an effective seal between the cover 11, seal 14 and container 10. The detents 39 are capable of some axial bending to permit the detents to contact the stops 28. At the same time the ring 13 is twisted in the groove 32, increasing the friction between the ring and the upper and lower walls of the groove 32 and the ring 13. In this position the lugs 40 and detents 38 and 39 are now all out of registry and the cover cannot be removed until all are again moved into registry with each other and with gaps 20.

By providing the horizontal portions 30, when detents 39 pass by the helical portions and engage said horizontal portions, there will be no tendency for the cover to slip back accidentally and break the seal.

To remove the cover the latter is rotated in a counter-clockwise direction. Again there is sufficient friction between the rings 12 and 13 and the cover 11 so that the rings move with the cover until detents 38 strike stops 25. The friction between the ring 13 and the upper and lower side walls of the groove 32 is sufficient to overcome the frictional resistance between the detents 39 and the surfaces 30 and 29 because the ring 13 has been twisted, as mentioned in the preceding paragraph, in the groove 32, and the ring does not resume its normal shape until the detents 39 move out from under those surfaces. Rotation of the cover counter-clockwise is continued until index 41 and letter A are aligned. During this movement detents 39 strike stops 27, preventing their movement, and when letter A reaches the index mark, lugs 40 and detents 39 are in registry, but detents 38 are not. The cover is then rotated clockwise to B, during which detents 38 strike stops 26, and when letter B registers with index 41 the lugs 40 and detents 38 and 39 are all in registry. The cover is then rotated counter-clockwise to C during which time the detents and lugs remain in registry, and when C reaches the index they are all in registry with gaps 20. The cover may then be lifted from the container.

The cover can always be rotated counter-clockwise continuously because there is no positive drive of the rings 12 and 13 in that direction, as by the shoulder 34. Once the detents have contacted their respective stops, the rings remain in the positions determined by the stops but the cover can slide on the rings. It is only when the cover is rotated clockwise that the cover is stopped and prevented from further movement. Of course the stops and the helical portions can be reversed so that it is necessary to rotate the cover in the other directions to effect the locking of the cover.

It will be appreciated that the invention has outstanding merit for the intended purpose even in the absence of the provision of means for locking the cover, especially when the container is to be filled with solid rather than liquid material and the provision of a tight seal is unnecessary. It is contemplated, therefore, that for some uses the cam surfaces 29 and the horizontal surfaces 30 may be omitted, together with the provision of means for positively driving the ring 13 into the locked position.

The construction of the container and the cover is such that they can be readily assembled by automatic machinery. The dimensions and shape of the lugs 40 are such that it is impossible for them to enter either of the grooves 21 or 22 in the container. The only groove that the lugs can enter is groove 23. Consequently, rotation of the cover is prevented until the detents 39 and 38 are in positions to enter their grooves 21 and 22, respectively.

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From the foregoing it will be seen that this invention provides a novel combination lock for a container cover which is easily opened and closed and locked by one able to read and understand directions, but cannot be opened by small children, nor by adults unless the directions are followed exactly. Thus even an adult cannot open such a container accidentally.

The scope of the invention is indicated in the appended claims.

I claim:

1. A combination lock for a container cover comprising a container having an opening surrounded by an annular wall, a cover for said opening having an annular wall arranged in coaxial telescoping relationship with said first named wall, one of said walls having a plurality of axially spaced apart parallel grooves therein extending in a circumferential direction at least partially around said wall and opening toward the other wall, the side walls of said grooves having axially registering gaps therein, a ring rotatably mounted on the other wall, said ring having a detent thereon located in one of said grooves and adapted to pass through said gaps when in registry therewith, a fixed lug on the wall on which the ring is mounted extending into another of said grooves, said lug being adapted to pass through said gaps when in registry therewith, stop means on said one wall for limiting the rotary movement of said ring relative to said one wall, one of said walls of the groove in which the detent is located having a helically extending portion engageable by the detent on the ring in that groove, said detent and lug being selectively positionable in registry with said gaps by rotation of the cover in opposite directions to predetermined positions.

2. A combination lock for a container cover comprising a container having an opening therein surrounded by an annular wall, a cover for said opening having an annular wall arranged in coaxial telescoping relationship with said first named wall, one of said walls having a plurality of parallel grooves therein extending in a circumferential direction at least partially around said wall and opening toward the other wall, the side walls of said grooves having axially registering gaps therein, one of said grooves being limited in circumferential extent by means forming stops on opposite sides of said gaps, a ring rotatably mounted on the other wall, said ring having a detent thereon located in said last mentioned groove between said stops and selectively engageable therewith, said detent being adapted to pass through said gaps when in registry therewith, a fixed lug on the wall on which the ring is mounted extending into another of said grooves, said lug being adapted to pass through said gaps when in registry therewith, one of said walls of the groove in which the detent is located having a helically extending portion engageable by the detent on the ring in that groove, said detent and lug being selectively positionable in registry with said gaps by rotation of the cover in opposite directions.

3. A combination lock for a container cover comprising a container having an opening therein surrounded by an annular wall, a cover for said opening having an annular wall arranged in coaxial telescoping relationship with said first mentioned wall, one of said walls having a plurality of parallel grooves therein extending in a circumferential direction at least partially around said wall and opening toward the other wall, the side walls of the grooves having axially registering gaps therein, one of said grooves being limited in circumferential extent by means forming stops on opposite sides of said gaps, a ring rotatably mounted on the other wall, said ring having a detent thereon located in said last mentioned groove between said stops and selectively engageable therewith and adapted to pass through said gaps when in registry therewith, a fixed lug on the wall on which the ring is mounted and extending into the other groove, said lug being adapted to pass through said gaps when in registry

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therewith, one of the walls of the groove in which the detent is located having a helically extending portion merging into parallel portions on both sides thereof and engageable by the detent, said detent and lug being selectively positionable in registry with said gaps by rotation of the cover in opposite directions to predetermined positions.

4. A combination lock for a container cover comprising a container having an opening surrounded by an annular wall, a cover for said opening having an annular wall arranged in coaxial telescoping relationship with said first named wall, one of said walls having a plurality of axially spaced apart parallel grooves therein extending in a circumferential direction at least partially around said wall and opening toward the other wall, the side walls of said grooves having axially registering gaps therein, a pair of spaced apart parallel rings mounted on the other wall, said rings having detents thereon located in two adjoining spaced apart grooves and adapted to

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pass through said gaps when in registry therewith, stops on said one wall disposed for engagement by the respective detents to limit the rotary movement of said rings about said one wall, a fixed lug on the wall on which the rings are mounted extending into another of said grooves, said lug being adapted to pass through said gaps when in registry therewith, one of the walls of one groove in which one of the detents are mounted having a helically extending portion engageable by the detent on that ring, said detents and lug being selectively positionable in registry with said gaps by rotation of the cover in opposite directions to predetermined positions.

5. A combination lock for a container cover as defined in claim 4, wherein the grooves are on the wall of the container and the rings are mounted in grooves in the interior of the annular wall of the cover.

No references cited.