June 4, 1968 M. L. GREEN 3,386,273

LOCKABLE CLOSURE

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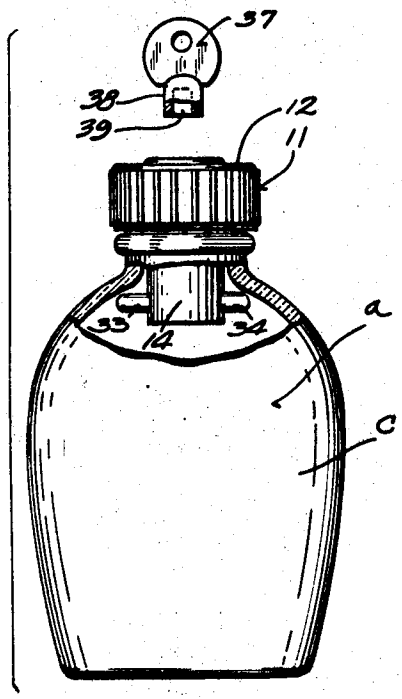


Fig. 1

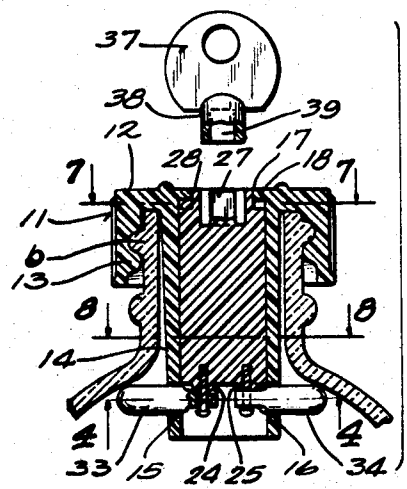


Fig. 2

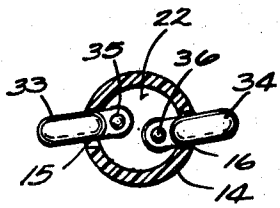


Fig. 4

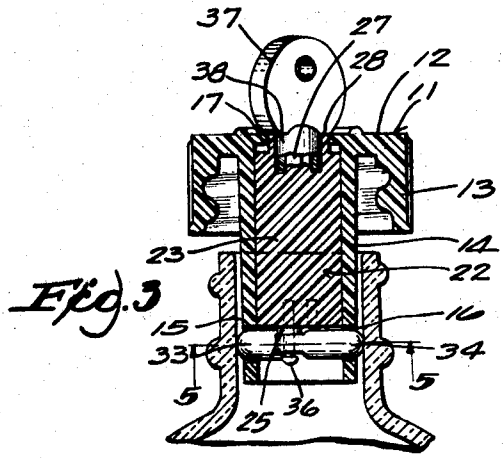


Fig. 3

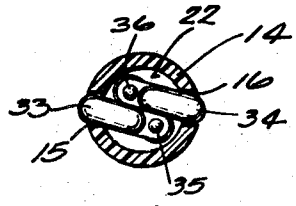


Fig. 5

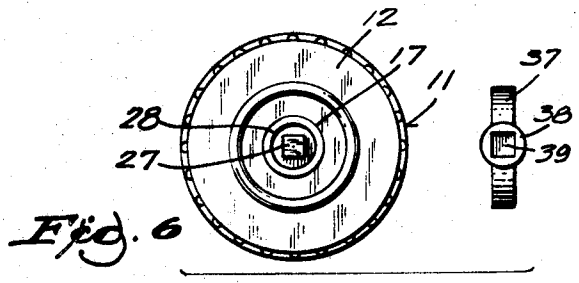


Fig. 6

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LOCKABLE CLOSURE

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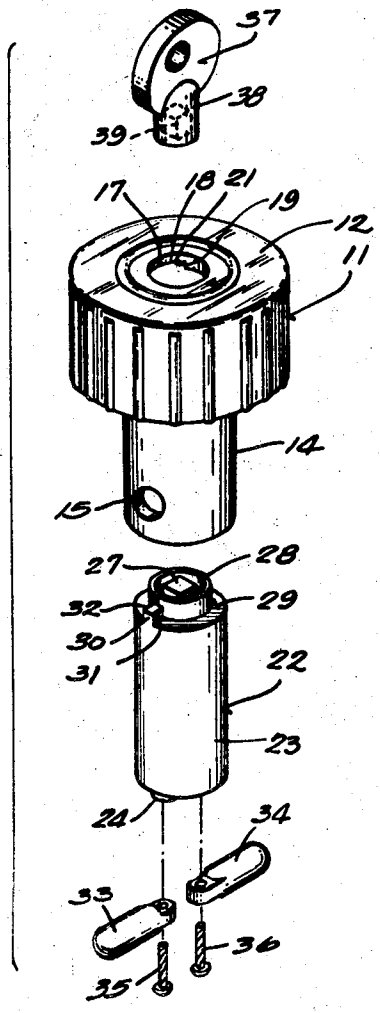


Fig. 9

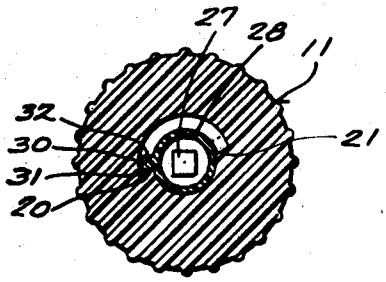


Fig. 7

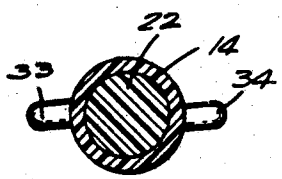


Fig. 8

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United States Patent Office 3,386,273 Patented June 4, 1968

3,386,273

LOCKABLE CLOSURE

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Filed Jan. 21, 1966, Ser. No. 522,315
2 Claims. (Cl. 70—168)

ABSTRACT OF THE DISCLOSURE

This invention relates to a lockable closure for aspirin bottles and the like. It includes a cap and depending tubular housing. A locking pin projects through an aperture in the tubular housing and is pivotally mounted eccentrically on the lower face of a plug which is rotatable within the tubular housing. The upper face of the plug is exposed through an aperture in the cap. Mutually cooperable means on a key and the upper portion of the plug permit the plug to be rotated by use of the key. Means are provided for limiting rotation of the plug from a first position in which the locking pin is substantially retracted into the tubular housing to a second position in which the locking pin extends substantially from the tubular housing. The position of the plug in which the locking pin extends the maximum amount being intermediate of said first and second positions.

Summary of the invention

This invention relates to a lockable closure for various containers and is particularly suitable for aspirin bottles, medicine bottles and the like.

Many containers for relatively dangerous substances are provided with a closure which is readily removable. This presents a substantial hazard to infants and young children who may be inclined to ingest the contents of such a container if the same is accessible to them as is often the case.

The primary object of the invention is to provide a lockable closure for a container which will prevent removal of the contents thereof. Another object of the invention is to provide such a lockable closure which is effective and yet simple and economical to manufacture.

In the present invention the lockable closure is of simple design and may be molded from plastic. The various parts are arranged so that when the lockable closure is in locked position, no amount of force will cause the parts to move to unlocked position. Unlocking of the closure may be accomplished only with the mating key or in the absence of the key requires such tools and degree of manual dexterity to make it unlikely that the same could be accomplished by an infant or young child. Accordingly, when my lockable closure is engaged on the neck of the container and placed in locked position, the closure may be removed only by exerting such degree of force as will cause one or more of the parts of the closure to fracture. When my lockable closure has been molded from suitable plastic, many adults do not have sufficient strength to cause such a fracture. Thus, the lockable closure even when molded from plastic should be completely effective for preventing infants and young children from removing the same from the container in the absence of the mating key.

Disclosure of the invention

Referring to the accompanying drawings:

FIG. 1 is a plan view of a bottle and my lockable closure and key with a portion of the key broken away and a portion of the bottle broken away to show the lockable closure in locked position.

FIG. 2 is an enlarged sectional view of a bottle neck and my lockable closure and key with the lockable closure in locked position as shown in FIG. 1.

FIG. 3 is an enlarged sectional view of a bottle neck and my lockable closure and key showing the lockable closure as it is being withdrawn from or inserted into the bottle neck.

FIG. 4 is a sectional view taken along line 4—4 of FIG. 2.

FIG. 5 is a sectional view taken along line 5—5 of FIG. 3.

FIG. 6 is a top view of my lockable closure and bottom view of the key to show their mating relation.

FIG. 7 is a sectional view taken along line 7—7 of FIG. 2.

FIG. 8 is a sectional view taken along line 8—8 of FIG. 2.

FIG. 9 is a perspective view of my lockable closure showing the various parts in spaced relation.

The embodiment of my lockable closure shown in the accompanying drawings is adapted for use on a bottle designated generally by the letter "*a*." The main body of the closure comprises a cap **11** formed from a circular top **12**, a depending internally threaded flange **13** for mating with the externally threaded neck *b* of the bottle *a*, and a tubular housing **14** which depends from the circular top **12** and which has an outer diameter smaller than the inner diameter of the container neck *b*.

The tubular housing **14**, near the lower end thereof, has diametrically opposed apertures **15** and **16** therein. The tubular housing **14** is of sufficient length so that when the cap **11** is threaded on the neck *b* of the bottle *a*, the apertures **15** and **16** are located just below the area where the neck *b* of the bottle *a* joins the main body portion *c* of the bottle *a*. The top **12** of the cap **11** has an aperture **17** therein which is of smaller diameter than the inner diameter of the tubular housing **14**, thus forming an annular ridge **18** between the periphery of the aperture **17** and the inner surface of the tubular housing **14** where it joins the top **12** of the cap **11**. The annular ridge **18** has a step **19** on its surface terminating at faces **20** and **21**.

Numeral **22** designates generally a cylindrical plug comprising a main body portion **23**. The main body portion **23** of plug **22** has two diametrically opposed bosses **24** and **25** near the outer periphery of its lower face **26** and terminates at its upper end in a stem **27** of square cross section and a flange **28** which encircles stem **27**. The flange **28** is of smaller diameter than the main body portion **23** of the plug **22**, thus defining a shoulder **29**. A small step **30** terminating at faces **31** and **32** is formed on shoulder **29**. The main body portion **23** of the plug **22** is adapted to slide into the tubular housing **14** with the top surface of step **30** bearing against the annular ridge **18** and the flange **28** extending into the aperture **17** in the top **12** of the cap **11**. The main body portion **23** of cylindrical plug **22** terminates at its lower face **26** above the apertures **15** and **16** in the tubular housing **14**. A pair of pins **33** and **34** are pivotally mounted at the inner ends thereof on the bosses **24** and **25** by drive screws **35** and **36**. Numeral **37** designates generally a key which has a shaft **38** having an aperture **39** therein of square cross section which engages stem **27**, thus permitting rotation of plug **22**.

The pins **33** and **34** are of such length that when the plug **22** is rotated to one extreme as shown in FIG. 5, the outer tips project through the apertures **15** and **16**, respectively, in the tubular housing **14**, with the distance between the outer tips of pins **33** and **34** being less than the inner diameter of the neck *b* of the bottle *a*. See FIG. 3. In the position shown in FIG. 5, face **32** of step **30** bears against face **21** of the step **19**. Rotation of the plug **22** which causes the pins **33** and **34** to be extended outwardly is limited by the abutment of face **31** of step **30**

against face **20** of step **19**. The various parts are so adapted and arranged that the limit of rotation of the plug to locked position as shown in FIG. 4 is beyond the position where the axes of the pins **33** and **34** are colinear. The significance of this arrangement is that when the plug **22** is rotated to locked position, forces exerted on the exposed portions of the pins **33** and **34** will not result in rotation of the plug **22** and retraction of the pins **33** and **34** into the tubular housing **14**.

Since many possible embodiments may be made in the invention and many changes might be made in the embodiment herein shown and described, as will appear to those skilled in the art, it is to be understood that the foregoing is to be interpreted as illustrative and not in a limiting sense.

What I claim is:

1. A lockable closure comprising a cap adapted to engage the neck of a container, a tubular housing depending axially from said cap, a plug rotatable within said housing, a key, an aperture in said cap exposing a portion of the upper surface of said plug, mutually cooperable means on said key and the exposed upper portion of said plug to permit rotation of said plug with said key,

a transversely disposed pin mounted at one end on the lower surface of said plug about an axis parallel to the axis of said plug and extending at the other end through an aperture in said tubular housing, and means for limiting rotation of said plug from a first position in which said pin is substantially retracted into said tubular housing to a second position in which said pin extends substantially from said tubular housing, the position of said plug in which said pin extends the maximum from said tubular housing being intermediate of said first and second positions.

2. The device of claim **1** wherein said means for limiting rotation of said plug comprises abutting projections on said plug and said tubular housing.

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