April 7, 1970 J. D. NORMAN, JR 3,504,652

VISUAL INDICATOR MEANS FOR A CONTAINER LOCKING MECHANISM

Filed Nov. 2, 1967

Fig. 1.

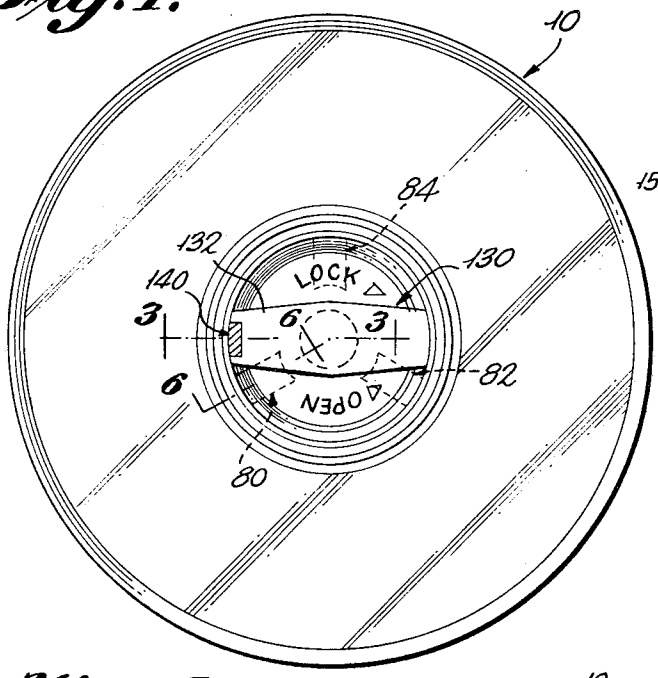


Fig. 2.

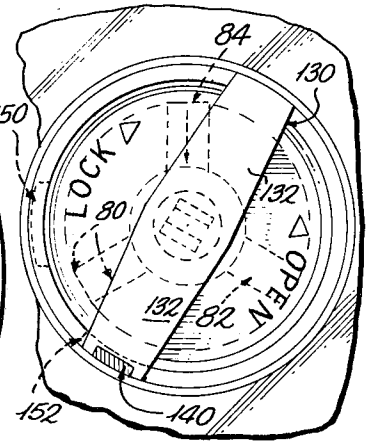


Fig. 3.

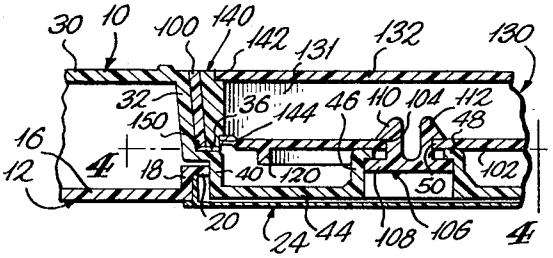


Fig. 4.

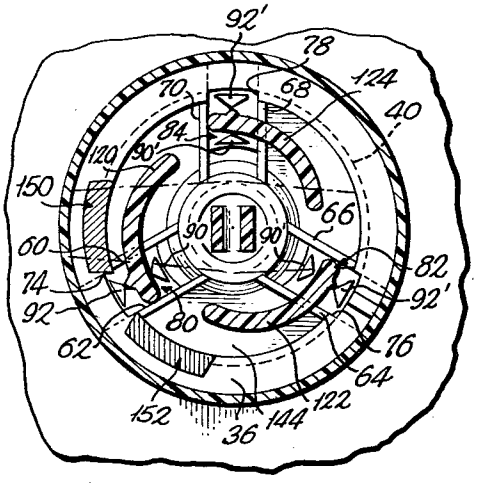


Fig. 5.

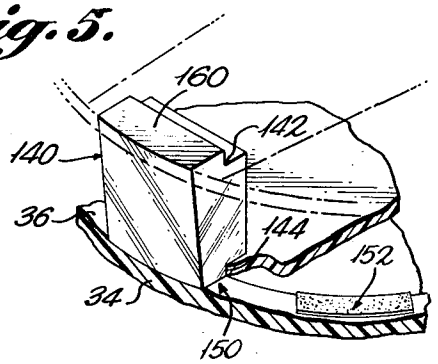
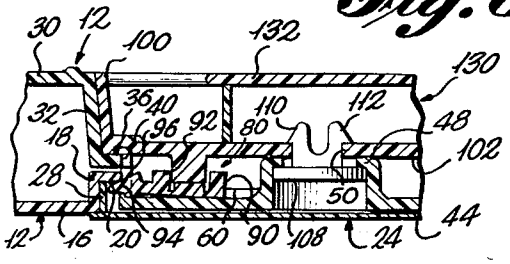


Fig. 6.



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VISUAL INDICATOR MEANS FOR A CONTAINER LOCKING MECHANISM

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U.S. Cl. 116—114 6 Claims

ABSTRACT OF THE DISCLOSURE

Two body portions of a container are held together by a locking mechanism including rotatable actuating means. Colored indicating portions are supported by one of the body portions and a light refracting and transmitting means is carried by the actuating means for transmitting the color from said indicating means to provide a visual indication as to whether the locking mechanism is locked or unlocked.

BACKGROUND OF THE INVENTION

The present invention relates to containers and particularly to tape reel containers having two halves which are held together by a suitable locking mechanism, and wherein the present invention provides a visual indication of the condition of the locking mechanism.

Tape reel containers commonly have locking mechanisms including rotatable actuating means for moving the locking mechanism into locked or unlocked position. It is desirable to have an indicating means for readily indicating to personnel handling the containers whether or not they are in locked condition. U.S. Patent No. 3,074,546 discloses a container locking mechanism having visual indicating means wherein different colors are employed to inform personnel whether the locking means is in locked or unlocked position. In the arrangement shown in this patent, the handle means is provided with a hole therethrough through which the colored portions of a washer therebeneath are viewed. Reflected light from the washer is employed to relay the desired image.

An arrangement such as shown in the aforementioned prior art patent is effective when the observer is viewing the locking mechanism in a direction extending substantially perpendicular to the plane of the associated body portion of the container, but the colored portions of the indicating means are not readily visible if the actuating means or handle of the locking mechanism is viewed from a relatively sharp angle. Additionally, the indicating means is not readily visible from a considerable distance, and accordingly, the utility of the indicating means is thereby restricted.

SUMMARY OF THE INVENTION

The actuating means of the locking mechanism in the present invention incorporates a light refracting and transmitting means, preferably in the form of acrylic plastic of one-piece construction which is adapted to be positioned adjacent colored indicating portions supported by an associated body portion.

Due to the light refraction and transmittance characteristics of the light refracting and transmitting means, the color of the indicating portion adjacent to the light refracting and transmitting means is readily discernible and is visible to personnel even when viewing the actuating means from a relatively sharp angle. Additionally, the color is also easily visible from a considerable distance.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a top view of a tape reel container incorporating the present invention;

FIG. 2 is an enlarged view of a portion of the structure illustrated in FIG. 1;

FIG. 3 is a sectional view on an enlarged scale taken substantialy along line 3—3 of FIG. 1 looking in the direction of the arrows;

FIG. 4 is a sectional view taken substantially along line 4—4 of FIG. 3 looking in the direction of the arrows;

FIG. 5 is a top perspective view partly broken away for the sake of clarity illustrating the light refracting and transmitting means of the present invention; and

FIG. 6 is a sectional view taken substantially along line 6—6 of FIG. 1 looking in the direction of the arrows.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing wherein like reference characters designate corresponding parts throughout the several views, the container comprises a first body portion indicated generally by reference numeral **10** and a second body portion indicated generally by reference numeral **12**. These body portions may be formed of a suitable plastic material such as acrylanitrile, and the material used may vary as desired. The two body portions are adapted to nest together and include conventional outer flanges which telescope within one another, suitable means being provided for sealing the two body portions together adjacent these outer flanges in the usual manner.

As seen most clearly in FIGS. 3 and 6, body portion **12** includes a side wall **16**, and an inner flange **18** of annular configuration extending inwardly from the inner portion of side walls **16**. This inner flange **18** includes an inturned portion defining an annular lip portion **20** which is adapted to cooperate with the locking mechanism hereinafter described for clamping the two body portions to one another.

Body portion **12** defines a central hole formed through the side wall **16** thereof, this hole being closed by a cover plate indicated generally by reference numeral **24**, the cover plate being of generally disc-like configuration with the peripheral edge **26** thereof disposed in a recessed portion provided adjacent the inner flange **18**. An annular flange **28** extends from cover plate **24** and is fitted within inner flange **18** and is suitably secured therein as by bonding it in place with a suitable bonding material such as glue or the like. In this manner, the cover plate serves to close off the hole formed through the body portion **12**.

Body means **10** includes a side wall **30** including an inner flange comprising an integral inwardly extending portion **32** of generally frusto-conical configuration, this portion joining with an annular portion **34** disposed substantially parallel with side wall **30** and defining an annular shoulder **36**.

Portion **34** joins with a portion **40** of generally frusto-conical configuration which in turn joins with an inner wall **44** disposed substantially parallel with side wall **30**. This inner wall includes a integral generally cylindrical projection **46** having an annular portion **48** at the terminal end thereof and disposed substantially parallel with the side wall **30**, this annular portion **48** defining a central hole **50** therethrough which may be generally circular in cross-sectional configuration.

The locking mechanism as well as the actuating means employed therewith is substantially identical with that disclosed in greater detail in copending U.S. patent application Ser. No. 680,170, filed Nov. 2, 1967.

As seen most clearly in FIG. 4, the inner wall **44** of body portion **10** includes a first pair of integral guide

ribs **60** and **62** which extend upwardly from wall **44** as seen in this view. A similar pair of guide ribs **64** and **66** are provided at a position approximately 60 degrees from ribs **60** and **62**, while a further pair of similar guide ribs **68** and **70** are provided further spaced 60 degrees from the other pairs of ribs as seen in FIG. 4 such that the ribs are disposed symmetrically about the wall **44**.

The guide ribs **60** and **62** are adapted to guide a locking member for movement through a hole **74** formed in the portion **40**. Similar holes **76** and **78** are provided through portion **40** for receiving locking members hereinafter described.

Three substantially identical locking members **80**, **82** and **84** are provided, each of these locking members being slidably supported upon the inner wall **44** of body portion **10** and being movable through the respective holes **74**, **76** and **78** into locking engagement as hereinafter described.

Referring now to FIG. 6, the construction of one of the locking members **80** will be described in detail, it being understood that the remaining locking members are of similar construction. As seen in FIG. 6, locking member **80** includes a pair of integral upstanding lugs **90** and **92** defining a space therebetween for a purpose hereinafter described. The locking member also includes an end portion **94** defining a tapered surface **96** which is adapted to engage the inner edge of the annular lip portion **20** of body portion **12**.

Referring again to FIG. 4, locking members **82** and **84** are provided with integral lugs **90'** and **92'** corresponding to the lugs **90** and **92** of locking member **80**. These lugs are adapted to be engaged by cam means formed on the actuating means hereinafter described for moving the locking members inwardly and outwardly from locked to unlocked position and vice versa as desired.

Referring particularly to FIG. 3, the locking mechanism of the present invention includes an actuating means having a main body portion including a generally frusto-conical side wall **100** which is adapted to fit within the frusto-conical portion **32** of body portion **10**, this side wall **100** joining with an integral bottom wall **102** having a central hole **104** of substantially square cross sectional configuration formed therethrough.

The actuating means is held in place by means of a stud **106** having an enlarged head **108** adapted to fit within the projection **64** of body means **10**, a pair of resilient leg portions **110** and **112** extending integrally from the enlarged head **108** and fitting through hole **104** and snapping into place as illustrated in FIG. 3 for retaining the actuating means in operative position with respect to the body portion **10**, yet permitting relative rotation between these parts.

As seen most clearly in FIG. 4, three curved cam portions **120**, **122**, and **124** are disposed in depending relationship from the undersurface of the lower wall **102** of the actuating means, these cam portions fitting between the lugs of the locking members **80**, **82** and **84** respectively so that upon rotation of the actuating means with respect to body portion **10** and the locking members, the locking members will be urged either outwardly or inwardly, depending on the direction of rotation of the actuating means.

A handle portion indicated generally by reference numeral **130** is defined by a pair of walls extending generally diametrically across the actuating means between opposite sides of the side wall portion **100**, one of these walls **131** being visible in FIG. 3. A top wall **132** is supported along the upper edges of the two side walls of the handle portion and is suitably secured in place as with glue or the like.

A light refracting and transmitting means **140** comprises a one-piece separate insert formed of clear material such as acrylic plastic having the desirable light refracting and transmittance characteristics as hereinbefore described. As seen particularly in FIG. 5, a pair of rectangular cutouts **142** and **144** are provided in the upper and lower edges thereof for supporting means **140** in place. As seen in FIG. 3, the upper wall **132** of the handle portion fits within the cutout **142**, and the lower wall **102** of the actuating means fits within the cutout **144**. It will be understood that suitable slots are provided in walls **132** and **102** for receiving the upper and lower portions of the light refracting and transmitting means **140**.

It is apparent that the light refracting and transmitting means is accordingly supported by the actuating means and rotates therewith as the actuating means is rotated for moving and locking members of the locking mechanism into one position or another. While the indicator means of the present invention has been illustrated in connection with a specific type of locking mechanism, it is apparent that it is also suitable for use with various other types of locking mechanisms wherein a rotatable actuating means is provided for operating the locking mechanism.

As seen most clearly in FIGS. 4 and 5, the indicating means of the present invention includes spaced portions **150** and **152** supported on the annular shoulder **36** of body portion **10**. Each of these indicating portions may comprise in a typical example a piece of brightly colored paper or the like which is suitably secured to the shoulder as by adhesive means or the like. Obviously, any suitable brightly colored means may be disposed on the annular shoulder to serve the purpose of the present invention.

The indicating portions are of different colors, and typically the portion **150** may be green, while the portion **152** may be red. As seen in FIG. 5, which represents the position of the actuating means and light refracting and transmitting means as shown in FIGS. 1, 3 and 4, the apparatus is in its locked position and the lower portion of means **140** is disposed directly over indicating portion **150**. Since the apparatus is in its locked positions, the container is in a safe "go" condition and accordingly, the green color will be visible at the upper portion **160** of means **140** as seen in FIG. 5.

When the actuating means is rotated into the position shown in FIG. 2 wherein the apparatus is in its unlocked position, the light refracting and transmitting means **140** will be disposed directly over the indicating portion **152**, and the red color will be visible at the upper portion **160** of means **140**, indicating to personnel that the apparatus is unlocked, and is not ready to be picked up or handled, or for that matter to be left in such condition for extended periods of time.

It is apparent from the foregoing that there is provided according to the present invention new and novel visual indicator means for a container locking mechanism wherein due to the light refraction and transmittance characteristics of the light refracting and transmitting means a suitable color is readily visible to personnel to indicate the condition of the locking mechanism even when viewing the actuating means from a relatively sharp angle, the co'or being visible from considerable distances.

What I claim is:

1. Visual indicator means for a container locking mechanism comprising a container having a first body portion releasably locked to a second body portion, locking mechanism carried by one of said body portions for releasably locking said body portions together in operative relationship, elongate actuating means rotatably supported by said one body portion for actuating said locking mechanism, said actuating means having first and second oppositely disposed ends, one of said ends having a channel-shaped recess formed therein, a light refracting and transmitting means disposed in said recess and carried by said actuating means, said one body portion including a narrow annular shoulder meas underlying the ends of said actuating means, a plurality of colored indicating means disposed in circumferentially spaced locations on said shoulder, said actuator and light transmitting means being rotatably movable to alternate positions with said light transmitting means disposed contiguous to one of said

color indicating means to visually indicate the status of said locking mechanism.

2. Apparatus as defined in claim 1 wherein said colored indicating means comprises colored tape adhesively secured to said annular shoulder.

3. Apparatus as defined in claim 1 wherein said spaced indicating means are of different colors.

4. Apparatus as defined in claim 1 wherein said light refracting and transmitting means includes an outer end portion presented to view, the opposite end portion of said light refracting and transmitting means being disposed so as to be positioned contiguous either of said spaced indicating means upon relative movement of said actuating means with respect to the associated body portion.

5. Apparatus as defined in claim 1 wherein said light refracting and transmitting means is formed of plastic material.

6. Apparatus as defined in claim 1 wherein said light refracting and transmitting means comprises a one-piece construction formed of acrylic plastic material.

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U.S. Cl. X.R.

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