

[54] CONTAINER WITH LOCKING ACTUATOR

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[58] Field of Search 206/45.15, 45.13; 220/20.5, 220/36; 49/336

[56] References Cited

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[57] ABSTRACT

A container including a main body having a cover pivotable between open and closed positions. Drive and locking means are interposed between the container body and cover for pivoting the cover between its open and closed positions and locking the container cover to the body in either of the positions. The means includes an actuator supported for reciprocal movement between extreme positions on the body, with cooperating surfaces on the actuator and the cover. The cooperating surfaces have a drive means on the intermediate portion thereof for moving the cover between opened and closed positions in response to movement of the actuator between extreme positions, and first and second locking means adjacent opposite ends of said intermediate portion of said cooperating surfaces for maintaining the cover in either position, as desired.

13 Claims, 5 Drawing Figures

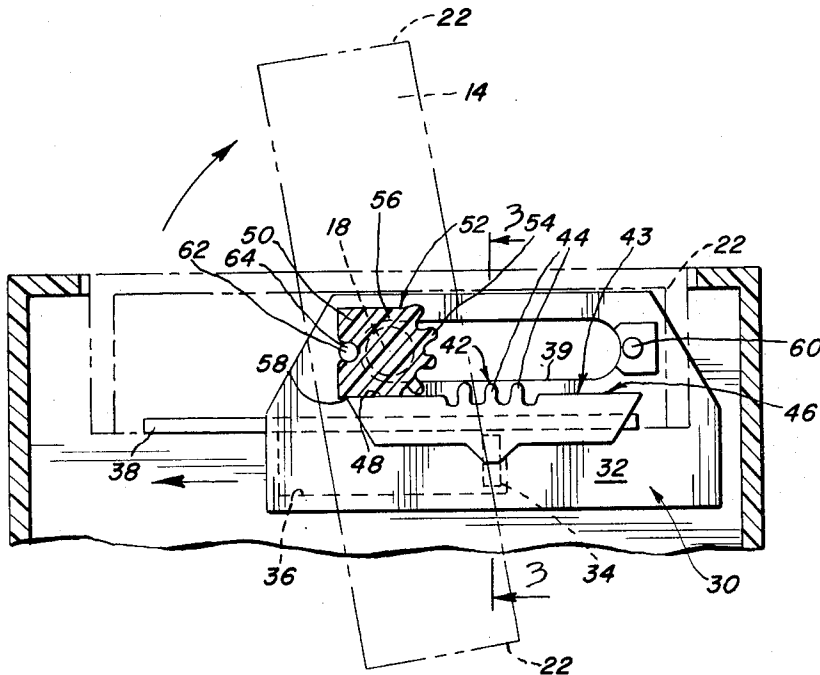


FIG. 1

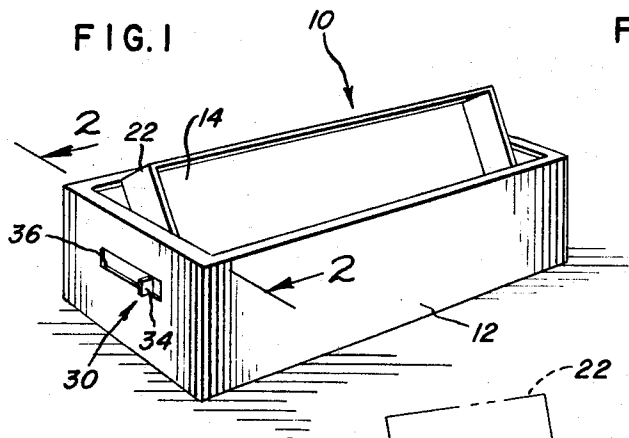


FIG. 3

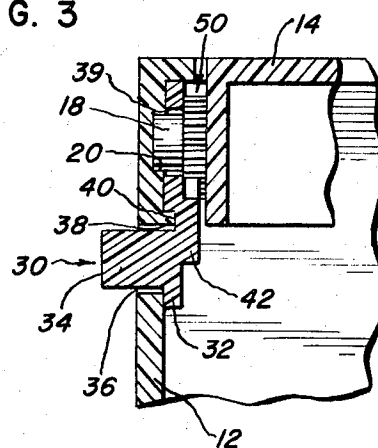


FIG. 2

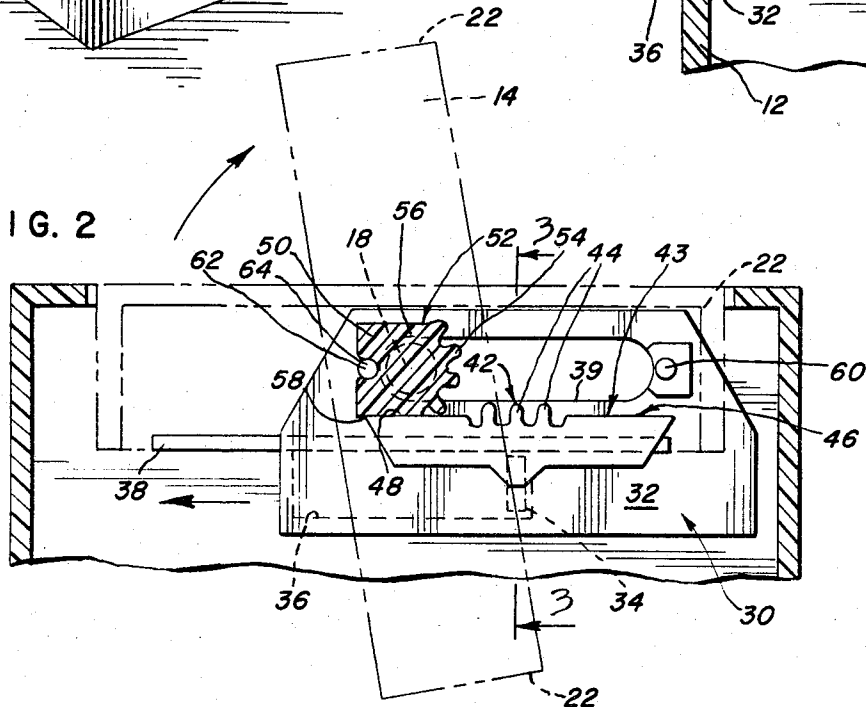


FIG. 4

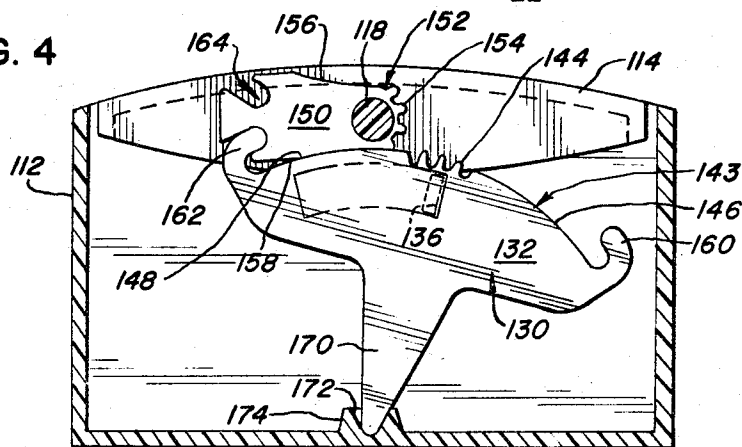
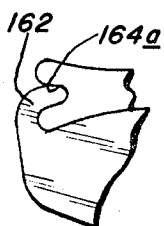


FIG. 5



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CONTAINER WITH LOCKING ACTUATOR

BACKGROUND OF THE INVENTION

The present invention relates generally to display containers and more particularly to improved mechanism for opening and closing such containers.

In the packaging industry, it has for some time been desirable to provide a pleasingly aesthetic package that could be utilized as a display container for merchandising the articles enclosed therein. Various types of packaging devices that are capable of being used as a display container are presently in existence.

However, because of the extensive competition in various areas of merchandising, manufacturers are constantly striving to gain a competitive advantage not only by producing more desirable type of articles, but also by encasing the articles in more attractive and durable containers.

SUMMARY OF THE INVENTION

The present invention provides an extremely attractive and durable container that can be utilized for shipping merchandise from a manufacturing operation to a retail establishment and also can be utilized for displaying the article to prospective purchasers. The container includes a cover that is movable between opened and closed positions by an actuator which also positively holds and locks the cover in either of the two positions relative to the container. The article to be displayed — as, for example, a wristwatch — is secured to the inside of the cover in a manner that will bring the article into view when the cover is swung to its open position.

In the illustrated embodiment of the invention, the container cover is pivoted on a main body and is movable between open and closed positions by an actuator that is reciprocally supported on the main body of the container. A pair of surfaces are respectively defined on the actuator and the cover that cooperate with each other (1) to lock the cover to the body in either a closed or an open position, and (2) to move the cover between closed and open positions while the actuator is moved between extreme positions. For this purpose, the cooperating surfaces have drive means along an intermediate portion of the cooperating surfaces and locking means on opposite ends of the drive means. The locking means include a portion of each of the surfaces on the cover and the actuator that are in extended contacting engagement with each other when the actuator and the cover are in either of the extreme positions. IN addition, if desired, additional locking means in the form of a projection and recess respectively defined on the actuator and the cover provide additional locking of the cover relative to the container in either of the two extreme positions.

In one embodiment, the actuator is an elongated member that is reciprocated along a planar path on the container body and has a substantially flat or planar surface acting as one of the cooperating surfaces referred to above. The other cooperating surface is carried by the cover, and is substantially U-shaped in configuration and has planar end portions that are in extended engagement with the planar surface of the actuator when the cover is in either of the extreme positions. The drive means includes a rack and pinion arrangement located respectively on the intermediate portion of the planar surface of the actuator and on the intermediate portion of the surface on the cover.

In an alternative embodiment, the actuating member is reciprocated by being pivoted about a fixed axis on the main body, with the cooperating surface on the actuator being arcuate or convex in configuration. In this embodiment, the end portions of the surface on the cover are concave and have a configuration corresponding to the configuration of the convex surface. The drive means in this embodiment is again in the form of a rack on the actuator, with a pinion located between the elongated concave surfaces on the cover.

BRIEF DESCRIPTION OF SEVERAL VIEWS OF DRAWINGS

FIG. 1 is a perspective view of a container having a cover in a partially open condition with the locking actuator of the present invention incorporated therein;

FIG. 2 is a vertical section taken generally along line 2—2 of FIG. 1 showing the cover in phantom;

FIG. 3 is a sectional view taken generally along line 3—3 of FIG. 2;

FIG. 4 is a vertical section of a slightly modified form of the invention as viewed outwardly adjacent the inner surface of the vertical end of the container; and

FIG. 5 is a fragmentary side elevation of a slightly modified form of the invention shown in FIG. 4.

DETAILED DESCRIPTION

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail two specific embodiments, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiments illustrated.

FIG. 1 of the drawings shows a container 10 consisting of a main body 12 and a cover or tray 14. As best seen in FIGS. 2 and 3, the cover is pivotally supported by a pair of pivot projections or pins 18 (only one being shown) that are rotatably supported in recesses 20 (one being shown) defined in the end walls of the container body 12. As shown in FIG. 2, the pins 18 project from opposite ends of the cover 14 at a location centrally between the two side edges 22 of the cover. Thus, the cover can be pivoted from a closed position shown by the phantom line in FIG. 2 to an open position that is 180° from the closed position.

According to the present invention, the means for pivoting the cover 14 relative to the main body 12 of the container 10 is capable of (1) moving the cover between the two extreme positions, and (2) maintaining the cover in either of the open or closed positions.

For this purpose, an actuator 30 is supported for reciprocal movement on the main body 12 of the container. IN FIG. 2, the actuator 30 includes an elongated main body portion 32 that has an actuating lug 34 extending therefrom and received through an elongated slot 36 in the end wall of the container 12. The actuator 30 is guided for reciprocation between extreme positions along a substantially planar path by an elongated rib 38 integral with the end wall of the container and received in an elongated recess 40 defined in the main wall 32 of the actuator 30. In addition, the upper portion of the actuator is supported between the container body and the cover and has an elongated slot 39 through which the pin 18 extends.

The actuator 30 further includes a rack 42 integral with the main body 32 and the rack has an elongated or flat surface 43 thereon. A plurality of gear teeth 44 are defined on an intermediate portion of the surface 43 and the gear teeth extend above the elongated planar or flat end portions 46 and 48 of the elongated surface 43.

The means for pivoting the cover further includes a pinion element 50 supported on the pivot means or pin 18 and integrally formed as part of the cover 14. The element 50 has a continuous substantially U-shaped surface 52 on the periphery thereof with gear teeth 54 on an intermediate arcuate portion of the surface and substantially flat planar end portions 56 and 58.

In the closed position for the cover 14, the planar or elongated end portions 48 and 58 of the surfaces 43 and 52, respectively are in extended contacting engagement with each other to provide a locking means for maintaining the cover in the closed position. In order to open the cover, it is only necessary to grasp the lug 34 and slide the lug along the elongated slot 36 in the direction of the arrow shown in FIG. 2. During the initial movement of the actuator, the planar end portion 48 of the surface 43 will be slid relative to the cooperating

elongated planar end portion 58 of the surface 52 on the pinion element 50. However, as the intermediate portion of the surface 43, with the projecting gear teeth 44, approaches the pinion element 50, the first of the gear teeth will engage the gear teeth 54 on the pinion element 50 of cover 12 and cause a pivotal movement of the cover about the pivot pins or means 18.

Since the intermediate portion of the surface 52 is substantially semi-circular in configuration and has a plurality of gear teeth 54 thereon, the meshing engagement of the teeth 44 and 54 will cause substantially 180° of pivotal movement of the cover as the actuator 30 is being moved to the left as viewed in FIG. 2. When the cover has been rotated 180°, the surface 56 on the cover will be in extended engagement with the surface 46 on the actuator to define the second locking means adjacent the opposite end of the intermediate portion of the cooperating surfaces 43 and 52 to maintain the cover in the open position.

From the above description, it will be appreciated that the surfaces 43 and 52 are cooperating surfaces on the actuator and the cover, respectively, and the gear teeth 44 and 54 define drive means on an intermediate portion of the cooperating surfaces for moving the cover between open and closed positions in response to reciprocal movement of the actuator relative to the cover. In addition, the flat, planar end portions 46 and 48 on the surface 43 and the flat planar end portions 56 and 58 on the surface 52 define elongated cooperating surface portions that are in extended engagement when the actuator and cover are in either of the extreme positions to positively maintain the cover in the respective positions. Thus, the actuating means for the cover may broadly be termed a rack and pinion arrangement with locking surfaces on opposite ends of each of the rack and the pinion.

While the cooperating locking surfaces 46, 56 and 48, 58 provide a locking means for maintaining the cover in either position, it may be desirable in certain instances to provide a more positive interlock between the cover and the main body of the container for either of the two positions for the cover.

Thus, according to another aspect of the invention, the first and second locking means further includes a pair of projections 60 and 62 on the actuator adjacent opposite ends of the elongated surface 43 and means, in the form of a recess 64, on the pinion element for receiving one of the projections when the actuator and the cover are in either of the extreme positions. The cooperating projections and recess provide a positive interlock between the cover and the actuator when they are in the extreme positions, while the initial movement of the actuator will cause the projection 60 or 62 to slide out of the recess 64 and allow subsequent pivotal movement of the cover and element in response to further sliding or reciprocal movement of the actuator.

A slightly modified embodiment of the present invention is disclosed in FIG. 4. Since the various elements forming the actuating means are substantially identical, like reference numerals have been applied with the addition of 100 to each of the reference numerals.

In the modified embodiment, the actuator 130 has a main body 132 with a tapered portion 170 tapering substantially to a point received in a recess 172 formed in an upwardly extending projection 174 on the lower wall of the main body 112. The elongated surface 143 is substantially arcuate in configuration and defines a rack having the gear teeth 144 along an intermediate portion of the surface 143 with the opposite ends 146 and 148 being convex in configuration. The elongated surfaces 156 and 158 on the pinion element 150 are concave in configuration and correspond to the configuration of the convex surfaces 146 and 148.

In the modified embodiment of FIG. 4, the projections 160 and 162 are integral extensions extending upwardly above the elongated surface 143 adjacent opposite ends thereof and cooperate with two recesses 164 defined in the remaining edge of the pinion element 150. Since the operation of the modified embodiment of the invention shown in FIG. 4 is

identical in connection with that described in FIG. 3, it is believed that no description of the operation is necessary.

While two recesses 164 have been shown in connection with the embodiment of FIG. 4 for receiving the projection projections 160 and 162, it will be appreciated that the projections may be located and arranged as shown in FIG. 5 where a single recess 164a can receive either of the projections 160 or 162.

The present display container provides a sturdy container which can readily be held in a closed position for shipment and which can be stored in any retail store in a closed position. Whenever it is desired to display the contents therein, the merchant need only manipulate the lug or lever to open the container and expose the contents supported in the cover.

It should be noted that while the present invention has been described in connection with a container where the cover supports the contents and is rotated substantially 180° to expose the contents in the cover, various modifications are considered within the spirit of this invention. For example, the cover could readily be pivoted adjacent one of the edges 22 and rotated approximately 90° between the closed and open positions. With such a modification, the elongated surfaces 56 and 58 on the element 50 would be located at a 90° angle relative to each other, while the intermediate portion 54 would encompass approximately a 90° segment with the gear teeth defined thereon.

I claim:

1. In a container having a main body and a cover, said cover having pivot means supported on said body for pivoting between open and closed positions, the improvement of means for pivoting said cover on said pivot means, which comprises: a locking actuator supported for reciprocal movement between extreme positions on said main body, said actuator including a rack having an intermediate portion and elongated surfaces on opposite ends of said intermediate portion; and a pinion element secured to said cover, said element having an arcuate portion cooperating with said intermediate portion of said rack and having a pair of elongated surfaces extending from opposite ends of said arcuate portion, one of said elongated surfaces on each of said rack and said element being in extended engagement when said cover is in an open or a closed position and said actuator is in either extreme position to maintain said cover in its respective positions, said intermediate portion and said arcuate portion being in engagement when said actuator is reciprocated between extreme positions to pivot said cover between open and closed positions.

2. A container as defined in claim 1, and including spaced projections on said actuator adjacent opposite ends of said elongated surfaces; and means on said pinion element for receiving one of said projections when said actuator is in either extreme position to interlock said actuator and cover in the open and closed positions.

3. A container as defined in claim 2, in which said actuator is supported for reciprocation along a planar path and said elongated surfaces on said actuator and pinion element are planar.

4. A container as defined in claim 1, in which said body includes means defining a recess and said actuator has a tapered portion received in said recess with said recess and tapered portion cooperating to define a pivot point for said actuator, and in which said rack has a convex surface defining said elongated surfaces adjacent opposite ends thereof, and said elongated surfaces on said element are concave and have a configuration corresponding to the configuration of said convex surface.

5. A container as defined in claim 4, and including cooperating interlocking projections on said element and said actuator for interlocking said actuator and cover in either extreme position.

6. A container as defined in claim 1, in which said intermediate portion of said actuator and said arcuate portion of said pinion element have cooperating gear teeth that are in meshing engagement when said actuator is reciprocated between extreme positions.

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7. In a container having a cover supported on a main body for pivoting between open and closed positions, the improvement of means for moving said cover between its said open and closed positions which comprises: an actuator supported for movement on said main body; means defining cooperating surfaces on said actuator and said cover, drive means on intermediate portions of said cooperating surfaces for moving said cover between said open and closed positions in response to movement of said actuator relative to said cover; and first and second locking means adjacent opposite ends of said intermediate portion of said cooperating surfaces for maintaining said cover in its open and closed positions, respectively.

8. A container as defined in claim 7, in which said actuator is pivoted on said body, and in which said cooperating surface on said actuator is arcuate and said cooperating surface on said cover has a corresponding arcuate configuration adjacent opposite ends, said cover and actuator cooperating surfaces being in extended engagement when said cover is in either extreme position to define said first and second locking means.

9. A container as defined in claim 8, in which said first and second locking means include a pair of projections respectively located adjacent opposite ends of said cooperating surface on said actuator; and means defining a recess adjacent opposite ends of said cooperating surface on said cover for receiving said projections when said cover is in either extreme position.

10. A container as defined in claim 9, in which said drive

means includes gear teeth on the respective intermediate portions of said cooperating surfaces, said gear teeth being in meshing engagement when said actuator is moved from extreme positions to pivot said cover on said body.

11. A container as defined in claim 7, in which said cover is pivoted on said body and said cooperating surface on said actuator is planar and in which said cooperating surface on said cover is substantially U-shaped with planar end portions and one of said planar end portions of said cooperating surface on said cover is in extended engagement with said planar surface on said actuator when said cover is in either extreme position to define said first and second locking means.

12. A container as defined in claim 11, in which said first and second locking means include a pair of spaced projections respectively located adjacent opposite ends of said planar surface on said actuator and means defining a recess adjacent opposite ends of said cooperating surface on said cover for receiving said projections when said cover is in either extreme position.

13. A container as defined in claim 12, in which said drive means includes gear teeth respectively defined on said intermediate portions of said cooperating surfaces, said gear teeth on said respective surfaces being in meshing engagement when said actuator is between extreme positions to pivot said cover on said body.

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