POP-OUT HANDLE AND LOCK CONSTRUCTION

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The present invention relates to a novel pop-out handle for a door or closure for sealing and locking engagement with a cabinet or other enclosure and more particularly to a pop-out handle and lock assembly for the pivoted closure of a vending machine or the like in which the handle is provided with locking means for the closure.

Vending machines are frequently subjected to tampering, damage or abuse and must be provided with effective locking means to prevent an unauthorized person from gaining access to parts of the machine, yet permitting an operator or authorized service man ready access thereto for servicing, replenishment of its contents and for collection of money deposited therein. Exposed handles have not been successful as they or their locking means may be broken or otherwise damaged or jammed in an endeavor to obtain access to the cabinet and its contents. To prevent such tampering, it has been the general practice to eliminate the exposed handle, but as many of such vending machines, especially those for vending soft drinks, etc., include sealing means such as a relatively heavy gasket between the closure and the cabinet which must be compressed to effect proper sealing, some means is required to exert sufficient pressure to the closure to assure tight sealing engagement and simultaneously locking the closure in closed position.

The present invention comprehends a novel means and manner of applying requisite pressure to the closure for applying the desired sealing between the closure and cabinet, and means for locking the closure with the sealing pressure applied. It includes a handle capable of being rotated to effect and maintain the requisite sealing pressure after which the closure is locked in closed position in which locked position the handle is nested within its mounting so that it cannot be grasped until the locking means is unlocked by insertion of the proper key.

An important object of the present invention is the provision of a novel pop-out handle and lock assembly for use on vending machines or in other suitable installations where a handle on the door or closure is locked in a retracted, inoperative position in which there are no protruding parts capable of being twisted or damaged by unauthorized personnel. Upon insertion of the proper key, the handle may be unlocked and released to a projected position where it may be freely rotated to actuate latching means for releasing and opening of the door pivoted or hinged to a cabinet or enclosure as well as for closing and latching the door in closed position with requisite sealing pressure.

Another important object of the present invention is the provision of a pop-out handle and lock assembly having a drive spindle with a suitable latch means thereon and a continuously engaged drive connection between the drive spindle and the handle. The drive connection allows reciprocable movement of the handle between its retracted and projected positions relative to the drive spindle, but provides constant engagement for rotational movement of the handle with the spindle without lost motion therebetween.

A further object of the present invention is the provision of a simplex hub for rotational movement in the handle pocket which has a flat blade portion within the housing and extending into the slotted rear end of the hub of the reciprocable handle to provide a positive driving connection therewith at all times. The spindle includes retaining rings preventing longitudinal movement of the spindle within the handle pocket and there is no rotational lost motion between the handle and spindle.

The present invention further comprehends the provision of a drive spindle which is adapted for utilization with various types of door latching means. The spindle may have a threaded outer end with a swing bolt mountable thereon adapted to cooperate with a suitable camming surface on the edge of the cabinet. Or the spindle may have a roll pin inserted therethrough which cooperates with a cam strike plate mounted on the cabinet or enclosure.

The present invention also comprehends a handle having alignment means thereon to cause proper alignment of the handle with the handle pocket before the handle can be retracted for any substantial distance. The alignment means includes a pair of longitudinally extending opposed ribs or keys on the cylindrical body or hub of the handle which fit in opposed longitudinal grooves in the interior surface of the encompassing cylindrical housing of the handle pocket.

Further objects are to provide a construction of maximum simplicity, efficiency, economy and ease of assembly and operation, and such further objects, advantages and capabilities as will later more fully appear and are inherently possessed thereby.

In the drawings:

FIG. 1 is a front elevational view of the pop-out handle and lock assembly.
FIG. 2 is a vertical cross sectional view through the assembly of FIG. 1 showing the handle in retracted position and showing a swing bolt secured to the rear end of the drive spindle where it is adapted to engage a strike or latch element on the cabinet or enclosure.
FIG. 3 is a rear elevational view of the assembly of FIGS. 1 and 2 with the swing bolt removed.
FIG. 4 is a front elevational view of the handle pocket or casing utilized in the assembly.
FIG. 5 is a side elevational view, partially in cross section, of the pop-out handle with its integral hub.
FIG. 6 is a rear elevational view of the handle shown in FIG. 5.
FIG. 7 is a side elevational view of the drive spindle shown in FIG. 2.
FIG. 8 is a top plan view of the drive spindle.
FIG. 9 is a rear elevational view of the drive spindle.
FIG. 10 is a front elevational view of the spindle.
FIG. 11 is a vertical cross sectional view of the assembly shown with the handle in its projected position but showing an alternate embodiment of drive spindle having a roll pin in engagement with a cam strike.
FIG. 12 is a front elevational view of the cam strike shown in FIG. 11.
FIG. 13 is a top plan view of the cam strike.

Referring more particularly to the drawings in which is shown illustrative embodiments of the present invention, FIGS. 1 and 2 disclose a pop-out handle and lock assembly 10 adapted to be mounted in a door or closure for a cabinet or other enclosure, having a handle 11 reciprocably and rotatably mounted in a handle pocket or casing 12. A drive spindle 13 is mounted for rotation in the handle pocket 12 and provided with latch means at its rear or inner end for latching engagement with a suitable strike member mounted on the cabinet or enclosure for the door.

The handle 11 includes a generally cylindrical hollow body or hub 14 extending rearwardly from the oppositely extending lever arms forming a generally rectangular gripping portion 15 of the handle. A suitable cylinder lock 16 is removably mounted within the handle, as shown.
in FIGS. 2 and 11, adapted to be actuated by a suitable key 17 to retract the radially projecting lock belt 18 which is resiliently biased outwardly through one of the opposed openings 19 or one of the longitudinally spaced opposed openings 19*, depending on the particular lock utilized. These openings are suitably aligned with openings in the handle pocket to be later described to retain the handle in its retracted position. The lock belt 18 has a camming surface 21 on the outer end for camming engagement with the handle pocket when the handle is moved inwardly to its retracted position.

The cylindrical body or hub 14 terminates at its rear or inner end in a radially outwardly extending flange 22 defining a central opening 23, said flange having at least one pair of diametrically opposed longitudinal slots 24 extending therethrough. As seen in FIGS. 5 and 6, the flange is formed with four equispaced slots 24 providing two opposed pairs. Also, a pair of opposed longitudinally extending ribs or keys 25 are formed on the exterior surface of the body 14 adjacent the gripping portion for purposes of alignment with the handle pocket 12.

The handle pocket 12 at its exterior comprises a generally rectangular escutcheon 26 having a recess 27 to accommodate and receive and accommodate the gripping portion 15 of the handle 11; the escutcheon including a rear wall 28 with openings 29 for screws, bolts or suitable securing means (not shown), to attach the handle pocket to the exterior surface of a door. A generally cylindrical housing 31 extends rearwardly from the escutcheon 26 and is adapted to extend through an opening in the door or other closure (not shown). The housing 31 includes openings 32 which are adapted to be aligned with the openings 19, 19* in the hub 14 to receive the end of the swing-actuated lock bolt 18, and the housing terminates in a rear or inner wall 33 having a central opening 34 therein. The housing 31 also includes a pair of opposed slots or grooves 35 forming keyways longitudinally extending along the interior surface of the housing 31 adjacent the recess 27 in the escutcheon 26 to accommodate the opposed ribs or keys 25 on the hub 14 of the handle 11 so that the handle is properly aligned to be received within the recess 27 and moved inwardly toward its retracted or locked position.

The drive spindle 13 has a central cylindrical shaft portion 36 concentrically received and extending through the opening 34 in the rear wall 33 of the housing 31, and in the recess as shown in FIGS. 2, 7 and 8 and terminates at its rear end 37 in a threaded portion 38 having opposed flattened surfaces 39. The other or forward end 41 of the spindle 13 forms a relatively thin flat blade 42 which extends through a pair of the opposed slots 24 and the central opening 23 to the interior of the hub 14. A pair of opposed grooves or slots 43 are formed in the edges of the blade 42 to receive a lock washer 44 to retain the drive spindle 13 in the hub 14 of handle 11.

A pair of spaced annular grooves 45 are formed in the intermediate shaft portion 36 of the spindle 13 to receive a pair of retaining rings 46 with the rings being positioned on opposite sides of the rear wall 33 of the housing 31. A washer 47 is also mounted on the shaft portion 36 between the wall 33 and each retaining ring 46. A helical spring 48 is mounted in the housing encompassing the spindle 13 with a larger diameter end abutting the central flange or rear end 22 of the hub 14 on the handle 11 and a smaller diameter end abutting the inner retaining ring 46. This spring yields to urge the handle 11 into its projected or extended position shown in FIG. 11 and in dotted lines in FIG. 2.

The interrupted threaded portion 38 on the outer end 37 of the spindle 13 is shown receiving a swing bolt 49 therewith; the swing bolt having an irregularly opening conforming to the arcuate surfaces of the threaded portion 38 and the flattened surfaces 39 so that the swing bolt must rotate simultaneously with the spindle 13 and cannot move independently thereof. A pair of mounting nuts 51, 52 threadingly engage the threaded portion 38 to securely retain the swing bolt 49 on the drive spindle, but also to allow for adjustment of the swing bolt.

The handle 11 is reciprocable within said handle pocket 12 between a retracted position shown in FIG. 2 and a projected or popped-out position shown in dotted lines in FIG. 2 and in full lines in FIG. 11. The lock bolt 18 extends through aligned openings 19 and 32 in the body 14 and housing 31, respectively, to retain the handle in its retracted position. When the proper key 17 is inserted into the cylinder lock 16 and rotated to retract the lock bolt 18, the helical spring 48 urges the handle to its projected position. It is noted that the flat blade 42 of the drive spindle 13 is in constant engagement with a pair of the opposed slots 24 so that the handle 11 and strike plate 59 always rotate together.

The handle 11 cannot be rotated when the gripping portion 15 is received in the recess 27 in the escutcheon 26, but once the handle is moved to its projected position, the handle can be rotated to unlatch and release the door by rotation of the swing bolt 49 away from its strike or camming surface (not shown) in one direction. Rotation in the opposite direction disengages the swing bolt 49 with its latching surface engaging the strike or camming surface of the door or closure into closed position and sealing contact in the opening of an enclosure. The handle can only be retracted into the pocket when the ribs 25 on the handle are aligned with and received in the grooves 43 in the handle pocket.

FIG. 11 discloses an alternate embodiment of drive spindle 13 having a cylindrical shank portion 53 terminating at the outer end in a generally conical end 54, and a flat blade 55 having a lock washer 56 mounted thereon. The retaining rings 46 and washers 47 are identical to those shown in FIG. 2. Adjacent the conical end 54 is an opening 57 extending diametrically through the shank 53 having a roll pin 58 mounted in the opening 57 with the radial projecting ends of the pin engaging a cam strike plate 59 as more clearly shown in FIGS. 12 and 13.

The cam strike plate 59 includes openings 61 for suitable securing means to mount the plate on a cabinet or enclosure and a central opening 62 to receive the end of the spindle 13*. The opening has radial opposed extensions 63 to receive the entering ends of the roll pin 58 and camming surface 64 which cooperate with the roll pin to latch the door in closed position. Rotation of the spindle 13* and roll pin 58 in a counterclockwise direction disengages the roll pin from the cam strike plate 59 to permit opening of the door, while rotation of the spindle 13* in a clockwise direction draws the door closed.

Having disclosed the invention, we claim:

1. A pop-out handle and lock assembly comprising a handle pocket including a cylindrical housing and an escutcheon having a recess therein for receiving the handle when retracted, a rear wall on said housing having a central opening therein, a longitudinally reciprocable and rotatable handle mounted in said handle pocket for movement between a retracted position and a projected position and a hub conformably received in said housing and having a hollow chamber therein, a radially inwardly extending flange defining the rear or forward end of the chamber, said flange defining a central opening and having at least one pair of radial opposed slots in the periphery of said opening, spring-biased means in said housing urging said hub and handle to projected position, a lock bolt in said handle engaging said housing to retain the handle in retracted position, a cylinder lock in said handle for actuation of the lock bolt, a drive spindle extending through the housing in the rear wall of the housing and terminating at its forward end in a flat blade, said flat blade extending through the opposed slots and central opening defined by said flanges into the chamber and provided with a lock washer at the forward end to retain the spindle against
removal through the flange at the rear end of the hub, said flat blade cooperating with said slots in the flange to allow longitudinal movement of the handle and hub relative to the flat blade, but causing simultaneous rotation of the spindle and handle, means on said drive spindle cooperating with said housing to prevent longitudinal movement of the spindle, and latching means secured to the rear end of said drive spindle.

2. A pop-out handle and lock assembly as set forth in claim 1, in which said hub of the handle include opposed longitudinally extending ribs thereon, and the interior wall of said cylindrical housing has opposed longitudinally extending grooves therein receiving said ribs to align the handle and handle pocket for relative longitudinal movement and retraction of the handle into said pocket.

3. A pop-out handle and lock assembly as set forth in claim 1, in which said flat blade has notches on its edges adjacent the inner end to receive said lock washer.

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