SLEEVE RECIPROCATING CORKSCREW

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

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This invention relates to improvements in hand-operated cork screws for removing cork stoppers from bottles and other containers.

The principal object of the invention is to provide expedient and automatic means for forcing the cork screw into the cork stopper of a bottle by downward pressure of the hand, and for subsequently withdrawing the stopper by limited rotary motion of the actuating element of the device.

Another object resides in the provision of effective means for centering the cork screw with respect to the stopper and for limiting its penetration, so that the danger of breaking the stopper or driving loosened particles into the bottle is substantially reduced, if not entirely obviated.

Additional advantages of the improved device will be apparent from the following description of the salient features of construction and cooperative arrangement of the cork screw illustrated in the accompanying drawings, and will be pointed out in the appended claims. In the drawings,

Fig. 1 is a side elevation of the improved cork screw;

Fig. 2 is a plan view thereof;

Fig. 3 is a longitudinal section, with certain parts shown in elevation, taken on line 5—5 of Fig. 2;

Figs. 4 and 5 show transverse sections taken on lines 6—6 and 7—7, respectively, of Fig. 3; and

Figs. 6 and 7 are views similar to Fig. 3, but showing the relative positions of the operating elements of the device when the cork screw is fully inserted into the stopper, and when the stopper has been withdrawn, respectively.

In the particular embodiment of the invention chosen for the purpose of illustration, the cork screw comprises a tubular casing 11, preferably having a flaring bottom to receive the mouth of a stopped bottle as indicated by the broken lines of Figs. 6 and 7; a sleeve or draw tube 12 slidably fitting within the casing, and provided with a cap or cover 13 over its upper or outer end, and with a nut 14 spun or otherwise fixed within its lower or inner end; a lead screw 15, threading in the nut 14 and carrying the cork screw 16 at its inner end; and an operating plunger 17 having a knob 18 attached by a taper pin or otherwise to its outer end, an inner stem 19 loosely received within an axial cavity in the outer end of the lead screw 15, and a circular flange or collar 20 slidable in the sleeve between the cover 13 and said outer end of the screw.

A helical spring 21 surrounds the lead screw between the nut 14 and a retaining ring or washer 22 fixed to said screw; and steel balls 23 are disposed between said ring and an annular flange 24 at the end of the screw 15, to provide a thrust bearing. A steel ball 25 is also provided between the end of stem 19 and the bottom of the cavity in which it fits.

The sleeve 12 is formed with a pair of complementary helical grooves 26, 180 degrees apart, and the casing has a pair of pins 27 fixed in its wall and extending into the respective grooves, so that the sleeve will rotate 180 degrees relative to the stationary casing, when the cork stopper is being withdrawn as hereinafter explained. The sleeve also has an interior annular shoulder 28 against which the ring 22 seats when the plunger is depressed to force the cork screw into the stopper, thereby to limit the extent of penetration.

The plunger rod 17 is of square or other non-circular shape (Fig. 4), and the cap 13 has an opening of complementary contour, so that the rod is keyed to the cover and may move longitudinally therethrough but cannot rotate relative to the cover or to the sleeve 12 on which the cap is tightly screwed or otherwise secured. The external threads of the lead screw 15 are helical and have a long pitch, and the internal threads of the nut 14 have a complementary pitch, so that the screw 15 is rotated in the nut and moved downwardly therethrough by axial pressure applied to the top of the plunger 17.

Hence, when the plunger is pushed inwardly by downward pressure on the knob 18 against the resistance of the spring 21, the sleeve remains stationary and the lead screw is rotated in the nut 14, thus twisting the cork screw into the bottle stopper, while the casing is applied to the bottle mouth and held stationary, as indicated in Fig. 6. It will be observed that the cork screw does not pass through the stopper, due to the limit stop afforded by the sleeve shoulder 28.

To withdraw the stopper, the knob 18 is then rotated in a clockwise direction, causing rotation of the capped sleeve and consequent longitudinal translation thereof, together with the lead screw, cork screw and stopper which are moved upwardly without appreciable rotation, to the position shown in Fig. 7.

By then twisting the knob in a counter-clockwise direction, the sleeve and spring resume their initial positions (Fig. 3) and the stopper may be manually removed from the cork screw.

A device constructed as above described, is
handy to use, speedy and efficient in operation, and effects the removal of the stopper without damage to the cork substance or contamination of the contents of the bottle. It will be understood, however, that the structural details of the cork screw herein illustrated and described may be varied without departing from the essence of this invention as set forth in the following claims.

1. A cork screw comprising a tubular casing, a sleeve rotatable and translatable within the casing, the sleeve having an end projecting from the casing and having a cap fixed over said end, a nut having long pitched, helical threads fixed within the opposite end of the sleeve and an annular interior shoulder between said sleeve ends, a lead screw having threads of complementary pitch threading into said nut and entering said sleeve, one end of the lead screw having an annular guide flange and a ball bearing including a ball-retaining ring, said ring engaging said shoulder to limit movement of the screw relative to the sleeve in one direction, the opposite end of the lead screw carrying a cork screw, a plunger passing through the cap and keyed therein, the plunger having a guide flange disposed within said sleeve and a stem depending therefrom, the adjacent end of the lead screw having a socket receiving said stem and bearing thereon, so that the lead screw is caused to rotate relative to the plunger and sleeve when the screw is forced through the nut by axial pressure on the plunger, and a coiled spring surrounding the lead screw between said nut and said retaining ring, the outer surface of the sleeve having a pair of helical grooves and the casing having a pair of pins engaging said grooves, whereby rotation of the plunger causes the sleeve to rotate and simultaneously to move longitudinally with respect to the casing.

2. A cork screw comprising a tubular casing, a sleeve rotatable and longitudinally movable within the casing, one end of the sleeve projecting beyond the corresponding end of the casing and having a cap attached thereon, a nut having long pitched, helical threads fixed in the opposite end portion of the sleeve, a lead screw having threads of complementary pitch threading in said nut, one end of said lead screw having a cork screw attached thereto and the opposite end of the lead screw extending into said sleeve having a bearing element, a plunger slidably passing through said cap and keyed thereto, one end of the plunger extending into the sleeve and having a rotatable bearing on said element, whereby the lead screw rotates in said nut relative to the plunger and sleeve, when said screw is forced through the nut by axial pressure on the plunger, and means operatively connecting the sleeve and casing, so that subsequent rotation of the plunger causes the sleeve to be moved, together with the lead screw, longitudinally of the casing.

3. A cork screw as described in claim 2, said operatively connecting means comprising a pair of helical grooves in the outer surface of said sleeve, and a pair of inwardly projecting pins fixed to the casing and engaging in the respective grooves.

4. A cork screw as described in claim 2, said operatively connecting means comprising slidably interfitting elements on said sleeve and casing respectively, and said sleeve and lead screw having complementary abutments mutually engageable to limit the extent of movement of the lead screw through said nut, in one direction.

5. A cork screw as described in claim 2, having a coiled spring surrounding the lead screw, one end of said spring engaging said nut, and a thrust bearing in said sleeve confining the opposite end of the spring.

6. A cork screw as described in claim 2, having a coiled spring surrounding the lead screw, one end of said spring engaging said nut, a thrust bearing in said sleeve confining the opposite end of the spring, the end of the lead screw extending into the sleeve having an axial cavity containing said bearing element, and the plunger having a stem extending into said cavity and against said element.

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REFERENCES CITED

The following references are of record in the file of this patent:

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<table>
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