Sept. 25, 1934. C. USBECK 1,974,760

BOX OPENER WITH ROTARY DRIVE

Filed Dec. 10, 1931

FIG. 1.

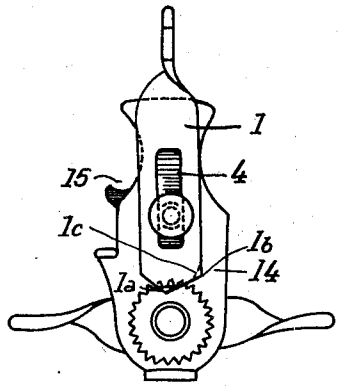


FIG. 2.

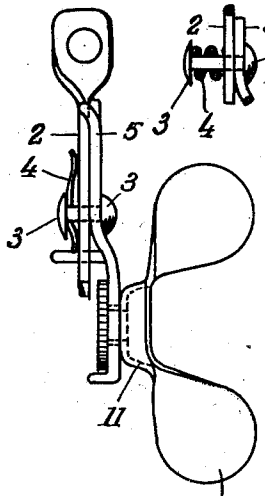


FIG. 3.

FIG. 4.

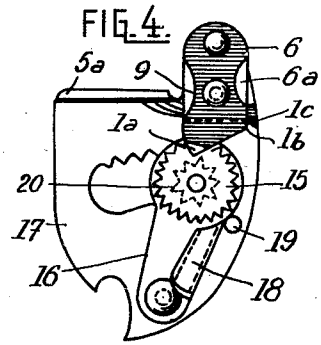


FIG. 5.

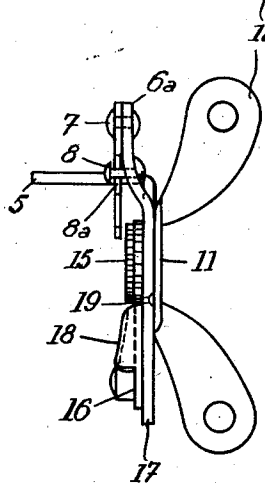


FIG. 6.

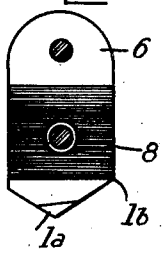
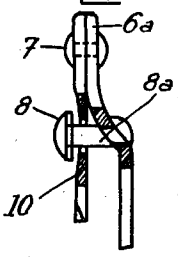


FIG. 7.



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UNITED STATES PATENT OFFICE

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BOX OPENER WITH ROTARY DRIVE

Christian Usbeck, Steinbach-Hallenberg, Germany

Application December 10, 1931, Serial No. 580,150
In Germany June 11, 1931

1 Claim. (Cl. 30—3)

This invention relates to improvements in box openers with rigid cutting knives and rotary drive, the driving and cutting elements of which are preferably arranged on a plate vertically inclined in the direction for use.

Tin box openers with rotary drive and plate vertically directed when the opener is in use are known in which a stationary or pivotally mounted knife and a driving element are arranged.

These known openers are, however, open to the objection that they turn laterally during the opening operation, so that a clean cut directly adjacent the edge is considerably impeded, especially if the box edge is dented or bulged.

This objection is overcome on box openers with stationary knife in that the flat knife is resilient. Moreover for this purpose the lever carrying the pinion and feed wheel and hingedly connected to the lower portion of the plate is provided with a relatively wide sliding and guiding support extending in wedge shape towards the feed wheel. Such supports are already known, but thereby the feed wheel is merely lifted from the box casing without preventing a turning or edging of the opener during the cutting.

According to the invention a novel combination of known elements is obtained with the result that the opener can no longer be turned or edged during the penetration of the knife and cutting operation so that a smooth pulling cut is carried out directly along the edge of the box, whereby the resilient knife whilst effecting a continuous cut considerably assists the sliding of the opener over any dents or bulges in the edge of the box.

On box openers with pivotally mounted knife the pressure spring arranged between the head of the knife bolt and the surface of the knife serves the same object and obtains the same result.

By means of such springs the knife is pressed tightly against the upward projection of the plate serving as counter bearing so that during the insertion of the knife and during the cutting the opener cannot turn or edge. This knife resiliency also enables a practical yielding and at the same time a bearing of the knife at those points where the box may be dented or bulged.

Several embodiments of the invention are illustrated by way of example in the accompanying drawing in which:—

Fig. 1 shows in front elevation a box opener with pivotally mounted knife.

Fig. 2 is a side elevation of Fig. 1.

Fig. 3 shows the arrangement of a spiral pressure spring between the knife bolt head and the surface of the knife.

Fig. 4 shows in front elevation a box opener with stationary resilient knife.

Fig. 5 is a side elevation of Fig. 4.

Fig. 6 shows the resilient knife arranged in front elevation.

Fig. 7 is a side elevation of Fig. 6.

In Figs. 4 to 7 the knife 1 recessed on both sides is secured to the free end of an upwardly projecting plate extension 2 by means of a rivet or screw 7. The surfaces of the knife may be tapered to ensure good resiliency. A bolt 8 fixed in the plate extension 2 below the rivet or screw 7 extends through a hole in the knife. This bolt secures the knife against lateral shifting and allows same to resiliently yield vertically to its surfaces. The same effect is attained, if the bolt 8 is omitted, by pressing up the edges of the plate extensions 2 so that the pressed up portions engage with clearance in the recesses 5 of the knife and form guides on each side of the knife. A guide 5*a* is bent over at right angles from the upper end of the plate 17. A lever 16 is pivotally mounted on the lower portion 17 of the plate and carries a pinion 20 at its upper end on an axle 22. A known relatively wide sliding and guiding support 18 narrowing in wedge shape towards the pinion 20 is arranged laterally on the lever 16. The movement of the lever 16 is limited by a stop 19 on the plate 17. The pinion 20 engages in an ascending arcuate rack 21 in an aperture in the plate 17 and its axle 22 carries a wing handle 23 at one end and a toothed feed wheel 15 at its other end.

The operation is as follows:—

The lever 16 is moved from under the knife 18 so that the pinion 20 is at the lower end of the rack. The point of the knife 1 is placed on the top of the box to be opened. The wing handle 23 is then turned in clockwise direction. The pinion 20 then engages in the rack 21 and moves the lever 16 towards the right, thereby pressing the feed wheel 15 against the under side of the beaded box edge and forcing the point of the knife 1 into the box lid until the guide 5*a* bears against the upper edge of the box. By continuing to turn the handle in clockwise direction, the opener will be caused to travel towards the right by the feed wheel 15, thereby causing the knife to cut the box lid adjacent its edge. As the knife is resilient, it will adjust itself to any irregularities in this edge.

In the form of construction shown in Figs. 1 to 4 the knife 1 is pivotally mounted on the ex-

tension 2 of the plate and is pressed tightly against the same by a spring 4. This spring is mounted on the bolt 8 and bears at one end against the head 3 of this bolt and at the other end against the outer surface of the knife 1. Thus, the knife can yield against the action of the spring 4 to adapt itself to any irregularities in the edge of the box.

In the construction the guide wheel 15 is fixed on the axle 22 which is rotatably mounted in the plate 17, a support 18*a* being provided on the lower edge of the plate 17.

The knife is pressed into the box until the guide 5*a* bears against the upper edge thereof and when the handle 23 is turned, the opener is fed along the edge thereof by the wheel 15 engaging under the bead thereof, the support 18*a* serving for maintaining the opener at the proper angle of inclination.

I claim:—

In a box opener, the combination of a plate having an upwardly extending projection, a knife mounted on said projection adapted to yield to conform with any irregularities in the edge of the box, means for feeding the opener along the edge of the box, said plate having an aperture provided with an arcuate rack, a pinion engaging in said rack, a lever carrying said pinion, a slide and guide support of wedge-shape on said lever adapted to bear against the side of the box and impart the desired angle of inclination to the opener, and a stop on said plate adapted to arrest the movement of said lever and support the same during the cutting operation.

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