Aug. 18, 1953 R. E. McLEAN 2,648,897

CAN OPENER

Original Filed March 4, 1948 2 Sheets-Sheet 1

FIG. 1.

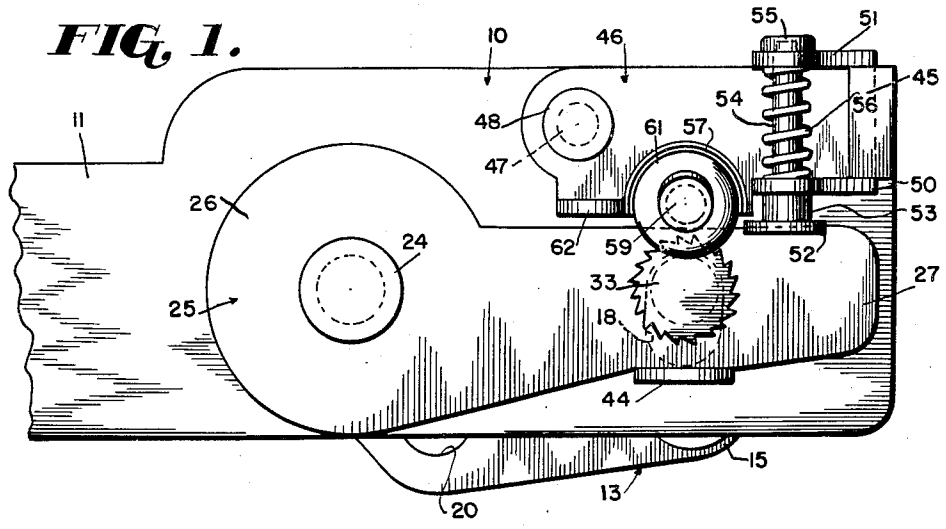
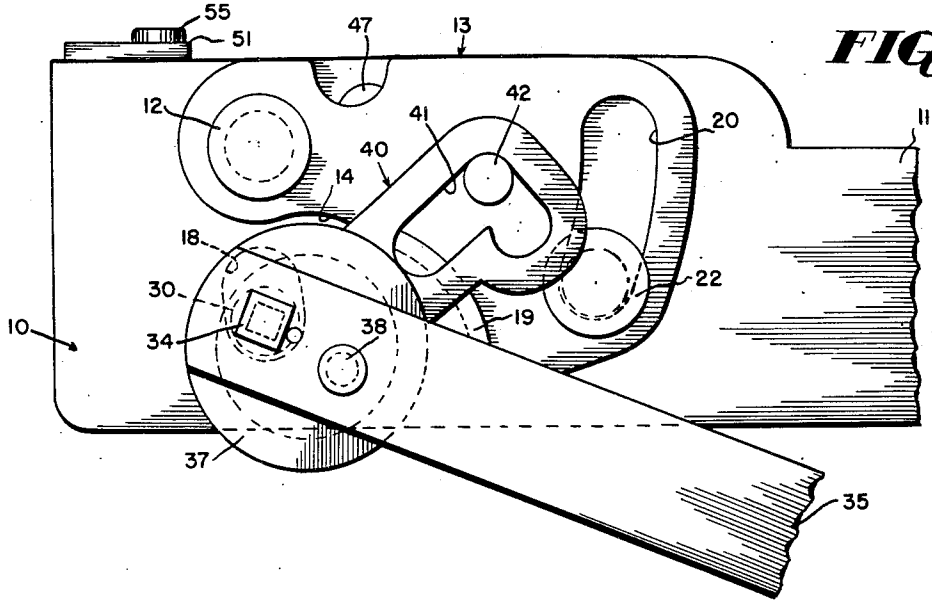


FIG. 2.



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Aug. 18, 1953 R. E. McLEAN 2,648,897

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Original Filed March 4, 1948 2 Sheets-Sheet 2

FIG. 3.

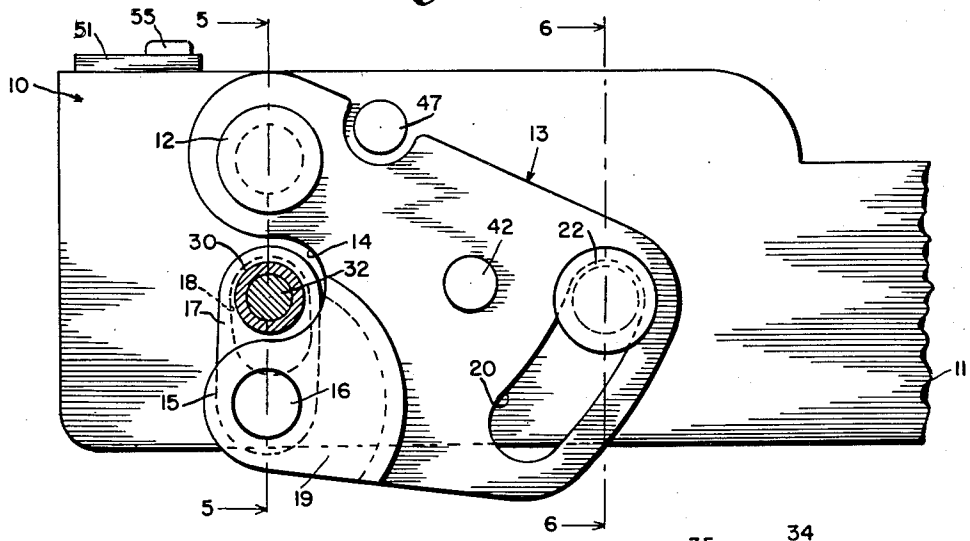


FIG. 4.

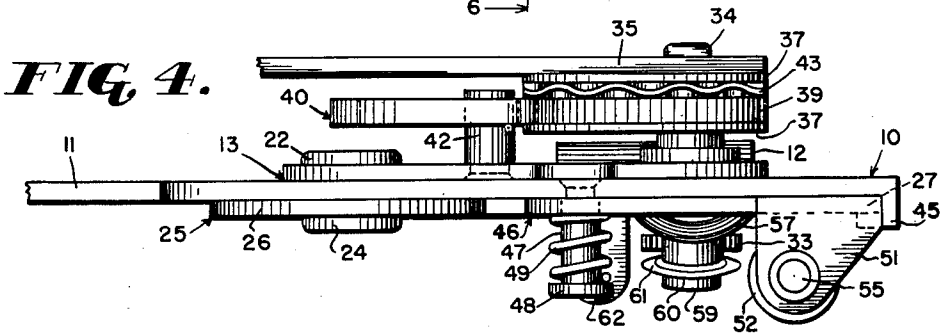


FIG. 5.

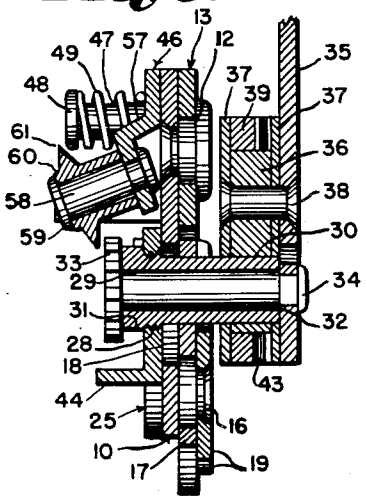
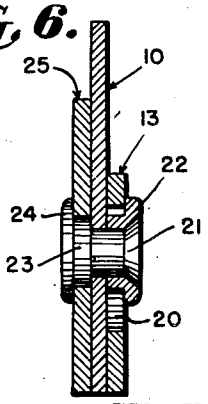


FIG. 6.



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CAN OPENER

Robert E. McLean, Kansas City, Mo., assignor to John C. Hockery, Kansas City, Mo., as trustee for Henry J. Talge and Foster L. Talge

Original application March 4, 1948, Serial No. 12,910. Divided and this application May 27, 1953, Serial No. 357,655

5 Claims. (Cl. 30—9)

1

This invention relates generally to the class of can opening devices of the rotary drive wheel type and is directed particularly to improvements in cutter supporting means.

The present application is a division of application Serial No. 12,910 filed March 4, 1948.

An object of the invention is to provide a novel carrier for a disk cutter, which is simple, strong and rigid and which is provided with an integral fixed can rest and a novel, simple and inexpensive resilient can rest particularly adapted for use with the form of opener described in the parent application and with other can opener structures.

Another object of the invention is to provide a novel carrier for a disk cutter which is mounted for movement in association with a fixed element forming a part of the body plate of the opener device, which fixed element maintains the cutter carrier in rigid alignment in relation to the body plate of the can opener to permit the rearward end of the cutter carrier, on which the disk cutter is relatively centrally mounted on an arbor secured in the cutter carrier, to be swung inwardly slightly against resilient means when necessary, such as when the seam portion of the side wall of the can is passing between the can driving wheel and the disk cutter.

A still further object of the invention is to provide a novel resilient can rest, for operation in association with a disk cutter carrier, forwardly of the disk cutter and which has movement only in a vertical plane.

Still another object of the invention is to provide a novel disk cutter carrier of the character stated in which no part thereof, including a resilient means which maintains the disk cutter adjacent to the can driving wheel, extends outwardly to such an extent as to interfere with the locating or operation of any other part on the right hand side of the supporting body plate of the opener.

A still further object of the invention is to provide a novel disk cutter carrier of the character stated, which is simple to manufacture, inexpensive and can be easily installed on the can opener in assembly.

Other objects and advantages of the invention will become apparent as the description of the same proceeds and the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming a part of the specification, with the understanding, however, that the invention is not to be limited to the exact details of construction shown and described since obvious modifications will occur to a person skilled in the art.

2

In the drawings:

Figure 1 is a view in side elevation of a rotary drive wheel type can opener showing the improved cutter and cutter supporting means.

Figure 2 is a view in elevation of the opposite, or right hand, side showing one form of driving mechanism.

Figure 3 is a view similar to Figure 2, with the driving shaft cut transversely at the inner side of the thrust mechanism operating eccentric and link, the parts shown being in the position which they assume when the operating crank has been turned clockwise to effect the movement of the driving wheel into working relation with the cutter.

Figure 4 is a view in top plane of the opener device.

Figure 5 is a vertical transverse section taken substantially on the line 5—5 of Figure 3.

Figure 6 is a vertical transverse section taken substantially on the line 6—6 of Figure 3.

Referring more particularly to the drawings the numeral 10 generally designates the body plate of one type of can opener upon which the cutter supporting means is adapted to be used. This body plate is of substantially rectangular outline and is formed integrally with an arm 11, the inner end of which is adapted to be secured in a suitable manner to a support.

Upon its outer or right hand side, the body plate has secured thereto adjacent to the top edge, a pivot rivet 12 which passes through and supports for vertical oscillation an end of a link plate which is generally designated 13, supporting such plate for oscillation at the side of the body. This link plate 13 has the recess 14 in the forward edge and below the recess the plate has the forwardly projecting portion 15 which is pivotally attached, by the rivet 16, to an end of a thrust link 17.

The body plate 10 has formed therein the short substantially vertically extending elliptical opening 18 over which lies an end of the link 17 for cooperative connection with the hereinafter described element which passes through the opening 18.

The lower forward part of the link plate 13 is pressed outwardly to be off-set from the adjacent side of the body plate 10, as indicated at 19, to provide clearance between the link plate and the body, for the lower end of the thrust link 17.

At its rear end the link plate 13 has the relatively long arcuate slot 20 formed therein, the arc

of which is struck from the center of the pivot 12.

Fixed in and extending through the body plate 10 is a rivet shank 21 which extends through the slot 20 of the plate 13 and has secured thereto the flanged head 22 which, as shown in Figure 6, has an overall diameter greater than the width of the slot 20 whereby it engages the outer face of the plate to maintain the latter closely in position against the side of the body plate 10. At its other end, the shank 21 is enlarged, as indicated at 23, and terminates in the enlarged integral head 24. Accordingly it will be apparent that the link plate 13 oscillates upon the pivot rivet 12 and its extent of oscillation is determined or limited by the length of the slot 20 in which the reduced portion of the attached head 22 on the rivet 21 engages.

Upon the inner or left hand side of the body plate 10 is positioned the drive wheel supporting plate which is generally designated 25. This plate comprises a relatively large circular rear end portion 26 and the relatively narrow forwardly extending portion 27 which lies across the opening 18, as shown in Figure 1.

In line with the opening 18, the plate 25 has formed therethrough the tapped opening 28 and extending through and engaging in this opening 28 is the threaded portion 29 of a relatively long bearing sleeve or journal 30 which passes through the opening 18 of the body plate as shown in Figure 5. The inner end of the eccentric journal 30 is enlarged to provide the head 31 which bears against the inner side of the drive wheel supporting plate 25.

At the opposite side of the body plate 10 the journal 30 passes through the upper end of the thrust link 17 and through the cut-out or recess 14 which is formed in the forward edge of the thrust plate 13.

Passing through the journal 30 is the shaft 32 and fixed upon the inner end of the shaft is the peripherally toothed can rim engaging driving wheel 33 which engages against the head 31 of the journal. The opposite end of the shaft 32 and of the journal 30 project a substantial distance to the right beyond the thrust plate 13 to have the following parts mounted thereon.

The outer end of the shaft 32 is reduced as indicated at 34 and engages in a suitable opening in the end of the crank or lever 35. This reduced end 34 may be of squared cross section to engage in correspondingly formed opening in the lever whereby to prevent any turning on the shaft.

Eccentrically mounted upon the journal 30 is an eccentric 36 which is designed to turn freely around the sleeve journal 30. The eccentric 36 is positioned between the two spacer disks 37 one of which positions against the adjacent side of the crank 35 and these disks, the eccentric and the crank are all secured together by the rivet 38.

As shown in Figure 5 the diameters of the spacer disks 37 are the same but they are materially greater than the diameter of the eccentric 36 and encircling the eccentric 36 to turn thereon is an eccentric ring or strap 39 which forms an integral part of one end of a slotted link 40. This link 40 extends in a general direction rearwardly from the shaft 32 and it has formed therein the relatively long longitudinally extending substantially L-shaped slot 41, the long arm of the slot running lengthwise of the link and the right angularly directed short arm extending transversely of the link at the rear end thereof as shown in Figure 2.

Engaging in the slot 41 is a pin 42 which is carried by the adjacent link plate 13. The width of this slot, both in the long and short arms thereof, is materially greater than the diameter of the pin 42 and also the short arm of the slot 41 is directed downwardly.

Encircling the eccentric 36 and interposed between the eccentric strap 39 and the adjacent spacer disk 37, is an annular corrugated spring 43. This spring is tightly positioned between the parts mentioned so as to maintain a relatively strong frictional engagement between the ring 39 and the disk 37 against which it bears so that upon turning of the crank 35 the link 40 will be turned or swung within the limits permitted by the part of the slot 41 in which the pin 42 is engaged.

Formed integrally with the plate 25 directly below the can rim engaging driving wheel 33, is the laterally extending can rest 44. This can rest is engaged by the side of a can when the latter is fixed to the cutter, whereby the can is maintained in proper position for engagement by the driving wheel and the cutter about to be described.

Formed integrally with the inner or left hand side of the body plate 10, adjacent to the top edge and at the forward end thereof, is the rearwardly directed guide lip 45. This guide lip has engaged between it and the body plate 10, the forward end of the cutter wheel supporting plate 46. The rear end of this plate 46 is supported upon the pin 47, one end of which pin is secured to the body plate. The pin extends laterally to the left and terminates in a head 48 between which and the cutter carrying plate 46 it supports under compression, the coil spring 49.

At its forward end the cutter disk supporting plate 46 has formed integral therewith the laterally projecting vertically spaced ears 50 and 51. These ears have the lip 45 engaged therebetween as shown in Figure 1 so that vertical movement of the plate 46 is thus prevented.

Disposed beneath the lower ear 50 is a can rest 52 which has a hub portion 53 which extends upwardly through an opening in the ear 50. Above the ear 50 this hub is continued by the reduced stem 54 which passes through a suitable opening in the upper ear 51 and has fixed thereto the rivet head or cap 55. Between the ears 50 and 51 the hub extension 54 carries the coil spring 56, the upper end of which bears against the under side of the ear 51 while the lower end bears against the upper end of the hub 53 thereby resisting upward movement of the hub and the can rest 52.

Immediately rearwardly of the can rest 52 and the ear 50, the lower edge of the plate 46 is struck outwardly to provide the inclined off-set portion 57, best seen in Figure 5. This off-set portion has fixed thereto the pivot stud 58, the outer end of which carries the enlarged head 59. Rotatably supported upon this stud 58 is a relatively long hub sleeve 60 which forms an integral part of a disk or circular cutter 61. Thus, because of the inclination of the outstruck portion 57, the plane of the disk cutter 61 is oblique to the side face of the wheel 33 against which the wall of the can engages and this wheel when moved upwardly passes across and in close proximity to the right hand side of the cutter wheel.

At the inner end of the cutter supporting plate 46, there extends laterally to the left from the lower edge of the plate the can flange rest 62 which cooperates with the yieldable or resilient rest 52 in engaging the top edge of the rim or flange of a can when the can is placed in cutting

position and has the head thereof penetrated by the cutter 61.

In the operation of the can opener described the operating handle 35 is first placed in the extreme rearwardly directed position as illustrated in Figure 2, if it is not already in such position, by counterclockwise rotation. The rivet 21 prevents further counterclockwise oscillation of the plate 13 beyond the position illustrated in Figure 2. Since the stud 42 is engaged in the shorter portion of the transversely extending leg of the L-shaped slot 41 during such counterclockwise oscillation of the plate 13, the operating handle or crank and the eccentric 36 secured thereto cannot be further oscillated counterclockwise. Friction exerted by the spring 43 tends to cause the slotted link 40 to rotate with the eccentric unit 36. However, such friction is pre-determined and need be only sufficient to properly overcome the weight of the outer end of the slotted link. With the parts as shown in Figure 2 the can driving wheel 33 will be in its lowered position due to the action of the plate 13 and the link 17 which support the bearing journal 30.

The can is then held with its upper end against the edge of the disk cutter 61 and with the rim or flange thereof above the toothed edge of the driving wheel 33. The operating handle is then rotated clockwise resulting in the raising of the wheel 33, the puncturing of the can head by the cutter 61 and the cutting out of the can head by continued rotation of the crank.

When the can is first positioned as described, during approximately the first half turn clockwise of the operating crank 35, the oscillatable link plate 13 and the link 17 are moved from the position shown in Figure 2 to the position shown in Figure 3, thereby elevating the can driving wheel as stated and causing, upon turning of the crank, the rotation of the can by the driving wheel.

The eccentric disk 36, through the slotted link 40 causes a required oscillation of the thrust plate 13. Inasmuch as the parts will then be in the position illustrated in Figure 3, wherein the axis of the pivot rivet 16 is slightly forward of a straight line across the axis of the pivot rivet 12 and the axis of the can driving wheel shaft 32 and further clockwise oscillation of the plate 13 is prevented by the movement limiting rivet 21, the journal 30 is maintained in the position illustrated in Figure 3 until the plate 13 is oscillated counterclockwise.

During the upward movement of the can driving wheel 33 and the can, the can rim engages the fixed can rest 62 and the resilient can rest 52, slightly elevating the latter against the predetermined tension of the spring 56. Further clockwise rotation of the operating handle 35 causes the can driving wheel to feed the can through the device to cut out the end of the can. However, such further clockwise rotation of the operating handle does not change the position of the oscillating plate 13 inasmuch as the slotted portion of the link 40 merely reciprocates on the stud 42 as the eccentric 36 rotates with the operating handle. As the can is fed through the device, the disk cutter 61 can be forced away from the can driving wheel 33, laterally, against the tension of the spring 49, a pre-determined amount when necessary, such as when passing the seam of the side wall of the can. However, the very slight swinging movement of the disk cutter carrier 46 required for such purpose is not sufficient to effect the alignment of the disk cutter carrier in the guide flange 45 at the forward end of the body plate. The tension of the spring 56 is such as to provide adequate traction of the teeth of the can driving wheel 33 with the under edge of the rim of the can.

The can guard 44 maintains the side of the can a pre-determined distance away from the lower surface of the can driving wheel.

When the end has been cut from the can and the operating handle is rotated counterclockwise to its extreme position to release the can from the device and prepare the device for reception of another can, initial counterclockwise rotation of the eccentric unit 36 causes the slotted link 40 to rotate therewith until further rotation is prevented by engagement of the stud or pin 42 with the lower edge of the slot through which it extends. When the stud 42 engages in the short arm of the slot 41, further counterclockwise rotation of the eccentric unit through the slotted link 40, oscillates the plate 13 to the position illustrated in Figure 2, thereby lowering the can driving wheel 33 and releasing the can from the device, the operating handle 35 assuming an out of the way position, as illustrated in Figure 2, without unnecessary turning upon completion of the operation of opening a can. Although rotation of the operating handle may be reversed from any possible position of the handle, less counterclockwise rotation thereof is required to release the can from the device if such rotation is commenced when the operating handle is in approximately a forwardly extended position. The operating handle is in a position approximately straight downward, where the maximum leverage is had by the operator, at the time the end of the can is actually punctured.

I claim:

1. A can opener of the rotary drive wheel type, comprising a body, a can rim engaging driving wheel, means supporting the wheel on the body for limited movement, an operating crank connected with the wheel for imparting rotary motion thereto, a can top cutter, a carrier upon one side of the body and supporting the cutter in a position for co-operative action with the wheel, the movement of the wheel being relative to the cutter, a member coupling the carrier with the body by which limited lateral pivotal movement of the carrier and the cutter relative to the body may take place, spring biased means supported by the carrier in position to be engaged by a can top flange engaged upon the under side by and receiving up-thrust from the wheel, and mechanism between the crank and the wheel supporting means by which the wheel is moved into working relation with the cutter upon the turning of the crank in one direction and the crank is subsequently released for continuous turning.

2. A can opener of the rotary drive wheel type comprising a body, a can rim engaging driving wheel, means supporting the wheel on the body for limited movement, an operating crank connected with the wheel for imparting rotary motion thereto, a plate disposed against the side of the body adjacent to the driving wheel, a cutter carried by the plate in a position for cooperative action with said wheel, a member coupling the plate with the body at its forward end to maintain said plate in parallel alignment with said body and against vertical movement, but permitting limited lateral swinging movement of the

plate away from said body upon application of thrust outwardly from the body against the cutter, a yieldable rest carried by the plate forward of the cutter for engagement by the rim of the can supported on the driving wheel, a fixed rest carried by the plate rearward of the cutter for engagement by the rim of the can supported on the driving wheel, and mechanism between the crank and the wheel supporting means by which the wheel is moved into working relation with the cutter upon turning of the crank in one direction and the crank is subsequently released for continuous turning.

3. A structure of the character stated in claim 2, wherein said yieldable rest comprises a pin member movably supported by said plate, a head carried at one end of the pin and engaged by the rim of the can, and spring means interposed between said head and a part of the plate and normally resisting movement of the pin in one direction.

4. A can opener of the rotary drive wheel type comprising a body, a can rim engaging driving wheel, means supporting the wheel on the body for limited movement, an operating crank connected with the wheel for imparting rotary motion thereto, a plate member disposed against the side of the body nearest to the driving wheel, means loosely coupling an end of the plate with the body, a guide pin secured to the body and extending through the plate at the other end thereof, spring means connected between the pin and the plate and normally urging the plate toward the body, a cutter carried by the plate in position for co-operation with the can driving wheel, a pair of can rim engaging rests carried by the plate on opposite sides of the cutter, the forward one of said rests being supported for yielding movement under pressure applied thereto by the can rim under the action of the driving

wheel, and mechanism between the crank and the wheel supporting means by which the wheel is moved into working relation with the cutter upon the turning of the crank in one direction and the crank is subsequently released for continuous turning.

5. A can opener of the rotary drive wheel type comprising a plate body designed to be disposed horizontally for use, a can rim engaging driving wheel, means supporting the wheel on the plate body for limited up and down movement, an operating crank connected with the wheel for imparting rotary motion thereto, a cutter supporting plate disposed adjacent to one side of the body plate upon the same side as and above the driving wheel, a cutter carried by the cutter plate in position for co-operative action with the driving wheel, means coupling one end of the cutter plate with the body plate, a pin secured to the body plate and extending through the other end of the cutter plate and supporting the cutter plate for limited outward movement from the body plate, resilient means between the pin and the cutter plate normally urging the cutter plate toward the body plate, a fixed can rim engaging rest carried by the cutter plate at one side of the cutter, a movable can rest carried by the cutter plate at the opposite side of the cutter, resilient means connecting the movable rest with the cutter plate, and mechanism between the crank and the wheel supporting means by which the wheel is moved into working relation with the cutter upon the turning of the crank in one direction and the crank is subsequently released for continuous turning.

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No references cited.