Dec. 1, 1936. W. G. FORBES 2,062,990

CIGARETTE CUT-OFF DEVICE

Original Filed Sept. 9, 1931 4 Sheets-Sheet 1

Fig 1

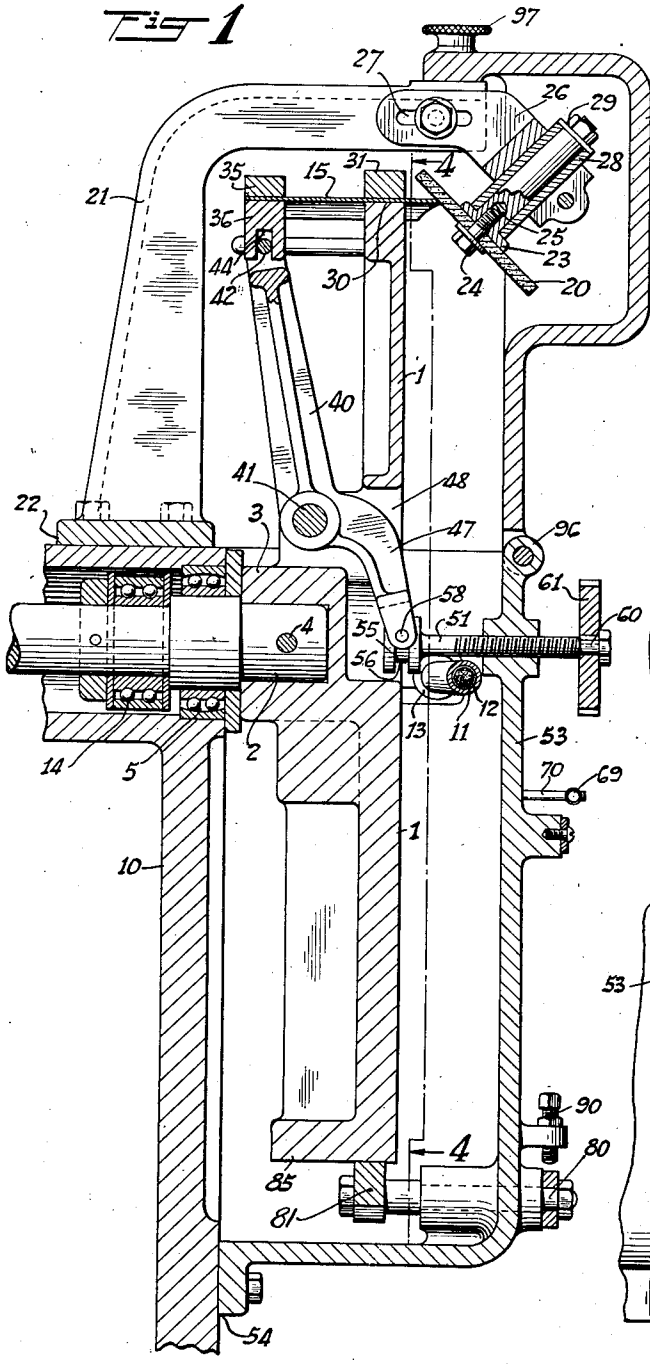


Fig 3

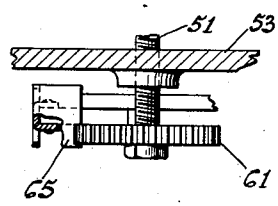
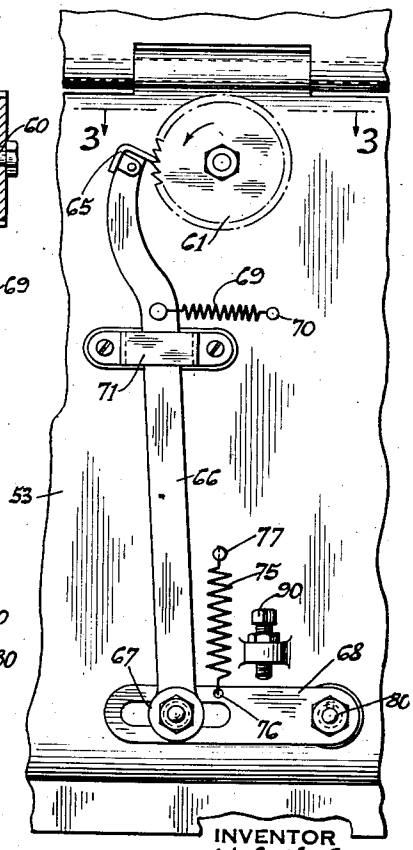


Fig 2



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Fig 4

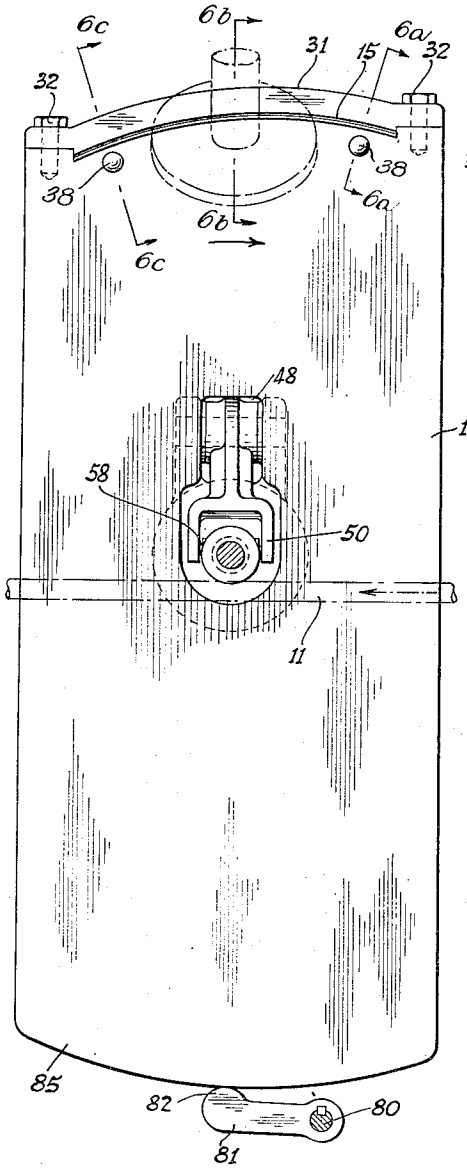


Fig 5

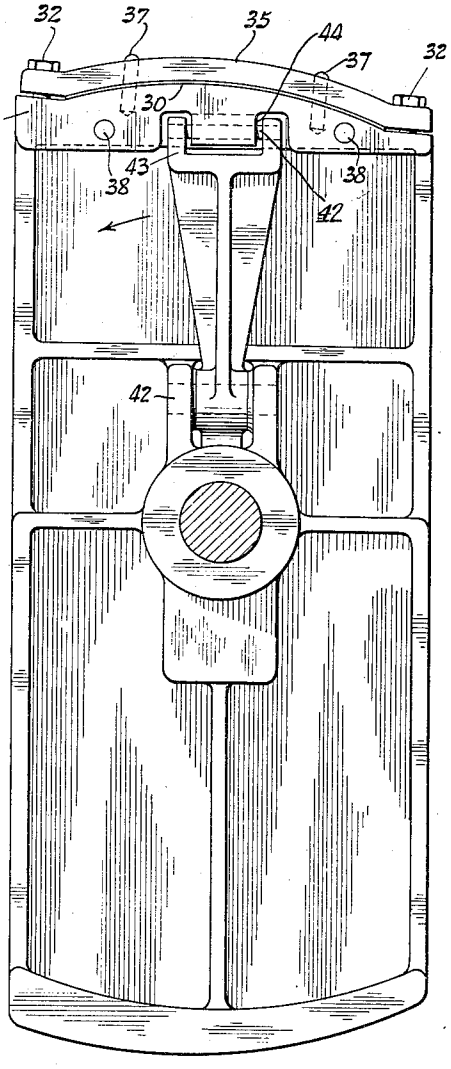
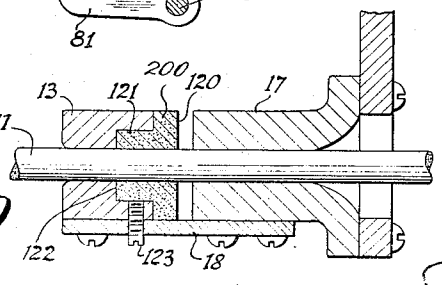


Fig 10



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CIGARETTE CUT-OFF DEVICE

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Fig 6

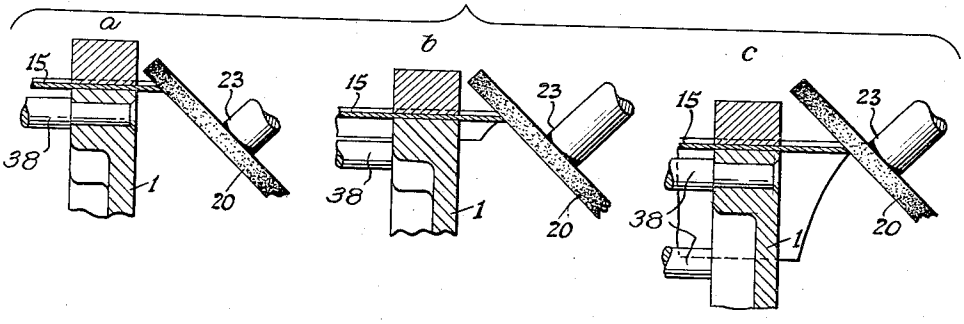


Fig 7

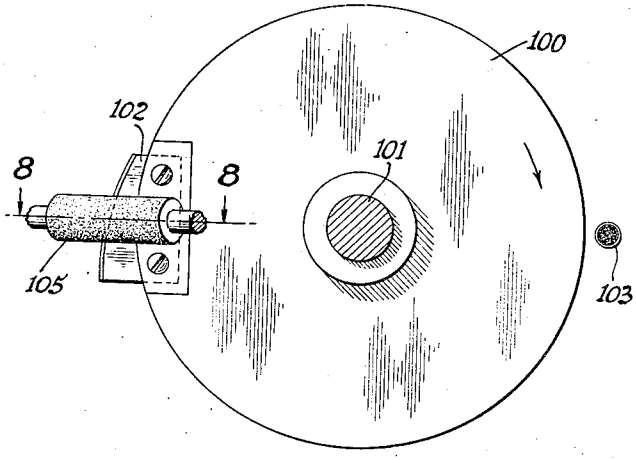
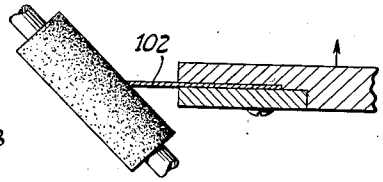


Fig 8



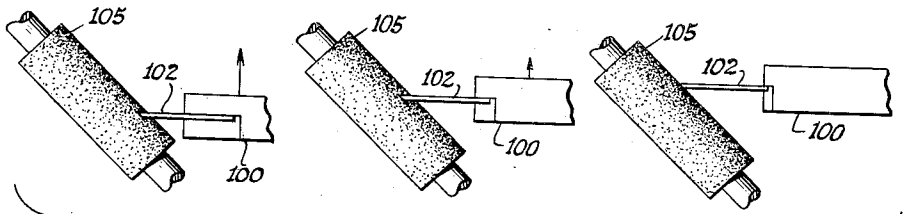


Fig 9

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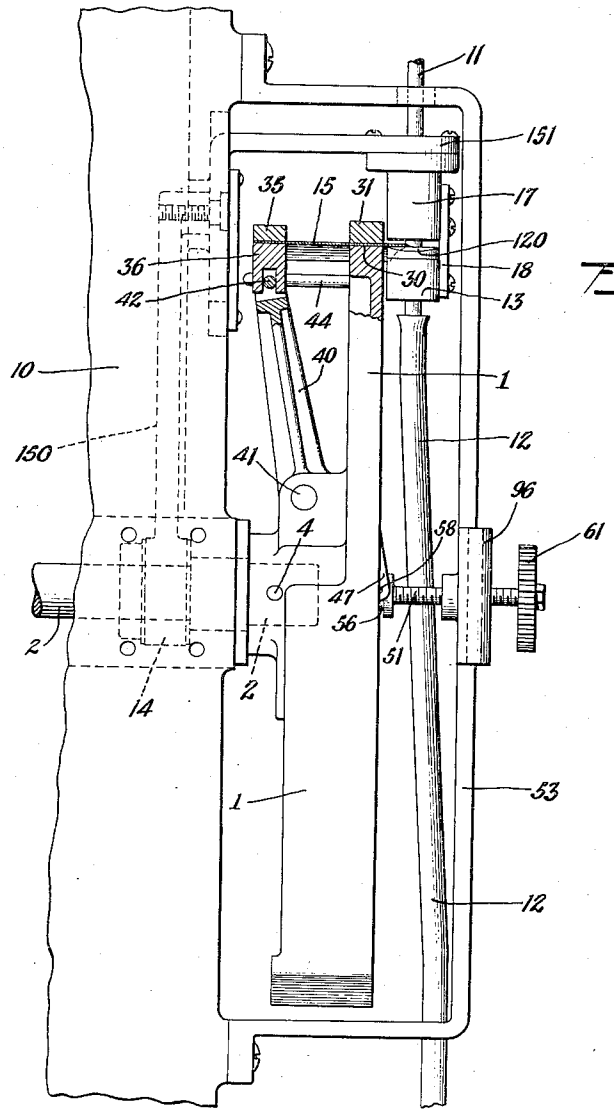


FIG. 11.

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Patented Dec. 1, 1936 2,062,990

UNITED STATES PATENT OFFICE

2,062,990

CIGARETTE CUT-OFF DEVICE

William G. Forbes, Albany, N. Y.

Application September 9, 1931, Serial No. 561,854
Renewed June 4, 1936

9 Claims. (Cl. 131—37)

The invention relates to cigarette-making machinery and, more particularly, to novel and useful mechanisms for cutting moving cigarette rods into cigarette lengths.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:—

Fig. 1 is a transverse vertical section, with parts shown in elevation, of a cigarette cut-off mechanism embodying my invention;

Fig. 2 is a fragmentary detail, in elevation, of the lower portion of the mechanism shown in Fig. 1;

Fig. 3 is a horizontal transverse section taken on line 3—3 of Fig. 2;

Fig. 4 is a view of the knife-supporting mechanism taken on section line 4—4 of Fig. 1;

Fig. 5 is a reverse view of the mechanism shown in Fig. 4, showing the rear side of the knife-supporting disc;

Fig. 6 is a fragmentary detail of the knife and grinding means shown in Fig. 1, illustrating three of the successive positions of the knife during the grinding operation;

Fig. 7 is a fragmentary and partially diagrammatic view of a rotary fly-knife cigarette cutter embodying my invention;

Fig. 8 is a horizontal section taken on line 8—8 of Fig. 7;

Fig. 9 is a partially diagrammatic view similar to Fig. 8 and showing three successive positions of the fly-knife during the grinding operation;

Fig. 10 is an enlarged fragmentary detail of a ledger plate with a grinding device thereon; and

Fig. 11 is a view showing conventional means for reciprocating the ledger plate.

The invention is directed to providing a novel and useful cigarette cut-off device having an exceedingly simple and efficient knife grinding or sharpening mechanism. The invention is particularly adapted for use with cigarette cut-offs wherein the knife or cutting edge is adapted to progress with the longitudinally moving cigarette rod during the cutting operation. The invention may be used with cutting devices having solely a rotary motion, wherein the progression of the knife edge is accomplished by virtue of the shape of the knife and its position with respect to its rotary supporting means. Rotary cut-off knives of this type are disclosed in my prior copending applications, Ser. No. 83,831 filed January 26, 1926, now Patent Number 1,889,403, issued November 29, 1932, and Ser. No. 130,366, filed August 20, 1926, now Patent Number 1,889,404, issued November 29, 1932. The invention also finds a wide field of usefulness in connection with rotary cutting devices of the "fly knife" type wherein the rotating blade and its support have a positive motion of translation with respect to the travelling cigarette rod. It will be understood, however, that my invention is not limited to cut-off devices of the types hereinbefore mentioned, but is capable of use with other cutting mechanisms as well, and is not necessarily restricted to cigarette cutting.

The invention provides a knife grinding or sharpening mechanism which is adapted to sharpen the knives in motion, said grinding mechanism itself being held stationary with respect to the frame of the cigarette machine. My invention completely eliminates the necessity for moving grinder supports or for any other means for moving the grinder in order to maintain a constant relationship between the grinding surface and all parts of the cutting edge of the knife.

I have discovered that by positioning a sharpening or grinding tool at a predetermined angle with respect to the path of travel of a cut-off knife, the grinding surface will make uniform and continuous grinding contact with the cutting edge in spite of the rotary and/or translatory displacement thereof. In accordance with the invention, the grinding means may be positioned so as to maintain the desired predetermined bevel upon the knife edge and will impart the desired grinding action to the knife by making contact along the entire edge of the knife during passage of the knife by the stationary grinding means. Generally speaking, the proper setting for the stationary grinding tool will depend upon the shape of the knife and the amount of linear displacement thereof in the direction of travel of the cigarette rod; and the angle or inclination of the grinding surface with respect to the knife will be predetermined by said shape and linear displacement of the knife.

The angles and setting of the grinding surface will vary, of course, with the shape and displacing action of the particular knife. However, having once determined the positioning of the grinding device with respect to the path of travel of the knife, the sharpening action is purely automatic and takes place solely by virtue of the movement of the knife, there being no bodily movement of the grinding means nor necessity for synchronizing such movement with that of the knife.

A further object of my invention is to provide means for compensatingly feeding or advancing a cut-off knife to take up for wear due to the grinding. By virtue of this feature of my invention, it is possible to use a blade of relatively very thin steel and yet avoid frequent replacements of the blade stock. The blade feeding means may be automatically operated and synchronized with the cutting and grinding action of the machine, although the invention is not limited to an automatic knife feed. Furthermore, the knife feeding means as designed, is especially adapted to cooperate with the novel grinding mechanism of my invention, but is not necessarily limited to such cooperation, as other known or suitable grinding devices may be used therewith.

In the present preferred embodiment of the invention, I provide a cigarette cut-off device comprising a knife rotatable in a circular path and means for feeding a cigarette rod axially across the face of the circle described by the knife. The knife is so mounted with respect to its center of rotation that the cutting edge of the knife progressively advances in the direction of movement of the cigarette rod as said edge shears through the rod, thereby making a cut perpendicular to the axis of the rod. The knife is preferably tapered in width so as to gradually cut across the rod. A knife mechanism of the type described is disclosed and claimed in my copending applications hereinbefore referred to. In combination with said cut-off device, I provide a grinding tool or surface mounted at a fixed locus in the path of movement of the knife and relatively remote from the cigarette cutting locus. The grinding tool is so positioned and inclined that the tapered, beveled and eccentric edge of the revolving knife blade will sweep across the grinding surface and receive a uniform predetermined grinding action therefrom. The grinding action is imparted without any bodily movement of the grinding means, the normal movement of the knife for the cutting action being utilized for the grinding movement as well. Accordingly no means need be provided for moving the grinder to follow the blade or for synchronizing the grinder movements with those of the blade.

The principles of my invention may also be embodied in a cut-off mechanism of the "fly-knife" type, such as is disclosed in the patent to Koerner, No. 1,573,616, dated February 16, 1926, for example, wherein a knife is rotated in a path normal to the travel of the cigarette rod and is given a bodily movement of translation in the direction of travel of the rod during the cutting action. I have devised a grinding device which may be mounted in a locus fixed with respect to the fly-knife, yet so positioned that the knife blade will sweep uniformly across the grinding surface during a portion of its combined rotary and translatory movements.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restricted thereon.

Referring now in detail to the present preferred embodiment of the invention, illustrated by way of example in the accompanying drawings, a knife-supporting body, disc or plate **1** is fixed to the end of rotatable driving shaft **2** by a suitable hub **3** and pin **4**. The shaft may be conveniently driven by suitable connections with the drive of the cigarette-making machine. The plate **1** and shaft **2** are adapted to rotate in the direction indicated by the arrows in Figs. 4 and 5, the shaft being provided with suitable thrust and rotary bearings **5** (only one shown) which are journalled in and supported by a convenient portion **10** of the cigarette machine frame, whereby the cutting mechanism may be disposed at a suitable location on the machine for severing the moving cigarette rod **11**. If desired, of course, the cutting mechanism may be provided with a special mounting separate from the body of the cigarette-making machine, but ordinarily it will be found preferable and convenient to incorporate the cutting mechanism in the frame of the cigarette machine.

The cigarette rod is indicated at **11**, being progressed from the cigarette-making machine (not shown) in a path across the plane of rotation of the knife-supporting plate **1** and in a line preferably parallel to said plane. A suitable ledger plate (Fig. 10) is provided adjacent the cutting locus, and said ledger plate is preferably reciprocable so as to provide an accurate shearing contact with the knife during the progression thereof through and across the moving cigarette rod. As shown, the ledger plate constitutes two spaced-apart tubes **13** and **17** connected by a plate **18**, tube **13** being provided with a grinding member **200** (hereinafter referred to), said member having an inner face **120** which forms the bearing and shearing surface for the knife blade. The means for reciprocating the ledger plate will preferably be actuated and controlled by connections by the driving shaft **2**, so as to synchronize the movements of the ledger plate with those of the cutting edge of the knife. A ball-bearing eccentric **14** may be mounted on shaft **2** and suitable devices may be provided for transmitting the reciprocating motion thereof to the ledger plate. Said devices may comprise a crank arm **150** actuated by the eccentric **14** and extending horizontally therefrom in a suitable groove in the frame **10**, and a pivotally connected cross arm **151** which is attached to and reciprocably actuates the ledger plate. A tube **12**, inclined away from the face of plate **1**, is provided for conducting the severed cigarettes out of the path of the knife and to a suitable receptacle.

Referring now to the cut-off knife itself and its mounting and movement with respect to the other mechanisms, a knife blade **15** is secured to the plate **1** near the periphery thereof and projects preferably perpendicularly from the exterior or right-hand surface thereof. The knife blade preferably comprises a relatively thin curved plate of tool steel or other suitable cutting metal. As indicated in Figs. 1, 4, and 6, the curvature and position of the blade are such that different portions of the cutting edge lie at different radial distances from the axis of rotation of the plate **1**, and this curvature or eccentricity of the cutting edge of the knife is such that said cutting edge will advance with the axially-moving cigarette rod during the cutting thereof and

thereby make a perpendicular cut solely by virtue of the rotation of the knife. Furthermore, it will be noted that the knife tapers in width, whereby the blade enters and gradually shears across the cigarette rod during the cutting movement. The shape, disposition and operation of the knife hereinbefore described are more fully disclosed in my prior copending applications and need not be detailed further herein.

Referring now to the embodied means for sharpening or grinding the cutting edge of knife blade 15, a grinding tool 20, shown in its preferred form as a flat disc of suitable abrasive material, is mounted adjacent to the path of movement of the knife blade and is adapted to make grinding contact with the cutting edge during a free or non-cutting period of the knife's orbit. As indicated in Figs. 1 and 6, the grinding surface 20 is mounted at a predetermined angle and in a predetermined plane with respect to the path of the revolving blade, whereby the cutting edge of the blade sweeps across the face of the grinding disc during a portion of the revolution of the blade.

The width or radius of the grinding disc is sufficient to contact with all portions of the curved or eccentric knife. That is, in the left-hand portion of Fig. 6, the grinder is shown contacting with the entering portion of the knife edge which is disposed farthest from the center of rotation of the plate 1 and thus the contact locus is relatively near the upper edge of the stationary grinding disc. The central view of Fig. 6 indicates contact between the grinder disc and an intermediate portion of the cutting edge which is closer to the center of rotation of the plate and therefore the grinding locus has approached nearer the center of the grinder disc. The right-hand view of Fig. 6 shows that as the knife leaves the grinder disc, the grinding contact is nearest the center of the grinder disc because of the shorter radius of revolution of that portion of the knife edge.

Referring again to Figs. 1 and 6, it will be noted that the angle of inclination of the flat grinder disc 20 automatically maintains the desired bevel on the knife edge and at the same time compensates for the taper or increasing width of the knife. In the left-hand portion of Fig. 6 it will be seen that the narrowest or entering portion of the knife lies against that portion of the inclined grinder disc which is closest to the supporting plate 1; while in the central and right-hand views of Fig. 6, the grinding surface is progressively farther removed from the plate 1 as the wider portions of the knife rotate into grinding position.

The embodied means for supporting the grinder 20 in the desired location and at the predetermined angle of inclination with respect to the knife edge comprise an overhanging bracket 21 which is fixed to the machine frame 10 at 22. The grinder disc itself is preferably attached to a supporting stud 23, as by a centrally disposed bolt 24 which projects through the disc and is received in a suitable screw-threaded, axial socket 25 in the stud 23. As shown, said stud is rotatably journalled in and supported by the bracket arm 26, said arm in turn being connected to bracket 21 by bolt and slot connection 27.

As shown, the grinder disc 20 and its supporting stud 23 are preferably rotatable with respect to the stationary bracket 26. Thus as the revolving blade contacts with the face of the grinder disc, said disc may rotate slowly on its axis and thereby provide for uniform wear throughout its contacting face. If desired, however, the disc 20 may be held entirely stationary with respect to the machine frame and supporting brackets, and rotation of the stud 23 in its supporting bushing 28 may be prevented by tightening of the screw-threaded collar 29 at the end of said stud.

The invention provides means for preliminarily varying the position of the grinder tool 20 so as to obtain the desired predetermined setting thereof. As embodied, the bolt and slot connection 27 permits variations in the proximity of the inclined disc to the rotating plate 1 and also permits angular movement thereof so as to vary the plane of inclination of the grinding surface. It will be understood that the invention is not limited to the particular means shown and described for supporting and varying the position of the grinding tool and that other means may be provided for effecting said variations or for otherwise changing the relation of the grinder and cutting mechanism, as may prove desirable in practice. For example, the position of the grinding tool need not be limited to that shown directly above the rotating shaft, but the grinder may be located at some other position in the path of rotation of the knife, should such change prove desirable. Furthermore, the grinder 20 need not necessarily be in the shape of a flat disc, but may be of different shapes such as a cylindrical rod or any other shape which will maintain the desired contact with the cutting edge.

In addition to the grinding means hereinbefore disclosed, which, as shown, applies an edge to the beveled portion of the knife, in some cases it will be found desirable to provide cooperating grinding means for the reverse or inside portion of the knife edge. For example, the grinding plate 20 may sometimes produce a slight burr on the inner surface of the knife edge and the hereinafter described means are provided for removing said burr and otherwise touching up the grinding action on the reverse face or edge of the knife.

As embodied, the ledger plate may be provided with a grinding surface 120 comprising an abrasive tube 200 with a reduced portion 121 which is seated in a socket 122 in the tube 18. Said tube 200 thus forms the shearing surface at the reverse side of the ledger plate and thereby imparts a compensating or balancing grinding action to the reverse portion of the knife blade. As shown, the grinding member 200 is detachable and replaceable, being held in the socket 122 by a set screw 123 passing through plate 18. The grinding tube may be removed and replaced by disengaging tube 18 from the connecting plate 18, as will be clear from the drawings.

While I have disclosed an abrasive tube for the grinding means on the ledger plate, it may be found in practice that other substances may be used to perform this complementary grinding action. For example, the ledger-plate tube 18 may be made of or faced with relatively hard steel or the like which itself will serve to remove the burr hereinbefore mentioned. It is obvious, of course, that a complementary grinding surface may be disposed at other points in the path of the revolving knife 15, but the allocation thereof to the ledger plate is shown as a preferred construction because of the convenience thereof and the necessity in any event for a shearing action between the knife and ledger plate.

The invention comprises means for feeding or advancing the knife blade away from the face of the supporting plate 1 to compensate for the wearing away of the blade, and said knife-feeding means may be manually or automatically actuated. As embodied, the knife blade 15 extends for a substantial distance to the rear of plate 1 (Figs. 1 and 5) and is slidably movable perpendicularly to the face of the plate. As shown, the blade is slidably clamped to the upper edge 30 of plate 1 by a curved, overlying cap 31 which is suitably and adjustably mounted by bolts 32 at the sides of the plate. The rear edge of blade 15 is received in a suitable holding clamp comprising upper member 35 and lower member 36, said members being suitably curved to receive the blade and secured together by pins 37, which also pass through openings in the blade. Said clamp is mounted for translatory movement perpendicular to the face of plate 1, being slidably supported on pins 38 which project perpendicularly from the rear face of plate 1.

The embodied means for regulably advancing the knife clamp 35, 36 and the blade 15 therewith comprises a lever 40 which is pivotally supported on an axle 41 at the rear end above the center of plate 1. As shown, the ends of axle 41 are mounted in a yoke formed integrally with the hub 3 of plate 1. The upper end of lever 40 is pivotally connected to member 36 of the knife clamp by a pin 42, the ends of which are received in the forked portion 43 of the lever. The pin is pivotally received in a slotted recess 44 in the lower portion of member 36.

The lower end of the lever 40 comprises a downwardly and forwardly projecting arm 47 which extends through and slightly beyond the front face of plate 1, the opening 48 being provided in the plate for this purpose. As shown, the lower end of arm 47 is substantially in line with the center of rotation of shaft 2 and disc 1. The lower end of lever arm 47 is forked to provide a yoke 50 which straddles the end of a screw-threaded actuating rod 51. Said rod 51 is mounted in axial alinement with the shaft 2, but is supported in a stationary guard casing 53 which is fixed to the stationary frame 10 of the machine as indicated at 54. The rear end of rod 51 is provided with an enlarged portion 55 having an annular guide 56 cut therein. The ends of yoke 50 of lever arm 47 are provided with inwardly projecting pins 58 which slidably engage the annular guide 56, whereby the lower end of lever arm 47 continuously engages the inner or rearward end of rod 51 as said lever rotates about the rod with the knife-supporting plate 1.

Thus it will be clear that axial movement of rod 51 will effect rocking movement of lever 40 and will thereby transmit its motion to knife blade 15 through the connection hereinbefore described to effect the desired advancing movement of the knife blade. As shown, axial movement may be imparted to the screw-threaded rod 51 by rotating the outer end 60 thereof, which projects through the casing 53. A knurled or toothed pinion 61 is preferably fixed to the outer end 60 of the rod 51 for rotating same to advance the rod toward and away from the plate 1. With the mechanism shown in Fig. 1, the feeding movement of the knife blade may be effected and controlled by manually actuating the pinion 61.

The invention provides means for optionally imparting an automatic actuating movement to the pinion 61 to thereby advance the knife blade automatically and in predetermined relation to the amount of grinding that the blade has received. As embodied, a pawl 65 is mounted in engagement with the toothed periphery of pinion 61 and is adapted to rotate said pinion in step-by-step relation with the rotating cut-off mechanism. As shown said pawl is mounted on the end of a relatively long actuating arm 66, the lower end of which is pivotally supported by a bolt and slot connection 67 with an actuating link 68. A spring 69 is attached to the upper portion of arm 66, and the other end of the spring is fixed to a pin 70 projecting from the face of cover member 53. Said spring serves to normally urge the pawl into contact with the ratchet teeth of the pinion 61. The movement of the arm 66 is guided by a suitable guide bracket 71, clamped to projections in the face of member 53. A similar, vertically disposed spring 75 is attached to the link 68 and the cover 53 at points 76 and 77 respectively and acts to force said link upwardly as shown.

Means are provided for imparting movement to the actuating link 68 from the rotating knife plate 1. As embodied, a shaft 80 is keyed to the right-hand end of link 68 and projects inwardly through cover plate 53 (Figs. 1 and 4). The inner end of the shaft is provided with a cam arm 81 which extends parallel to link 68 and in the plane of rotation of plate 1. Cam arm 81 has a raised portion 82 which lies in the path of rotation of the lower or counterbalanced end 85 of the knife-carrying plate 1.

It will be clear from the foregoing description that, as the end 85 of the plate 1 sweeps through the lowermost portion of its arc, the cam arm 81 will be depressed, thereby depressing link 68 and arm 66 so as to advance the ratchet pinion 61 a single step. When the end 85 has passed by cam portion 82, the spring 75 will raise the pawl to its released position.

Thus the knife blade 15 will be automatically advanced at a rate proportionate to the number of revolutions of the plate 1. The extent of advancement of the knife may be accurately controlled, as by the setting of stop screw 90 positioned to control the throw of link 68.

A suitable safety guard cover 95 may be provided for normally preventing access to the knife and grinding mechanism. As shown, the cover is hinged at 96 to the fixed guard cover 53 and is releasably attached by thumb screw 97 to the top of the device. By releasing the guard at 97, it may be swung down and access be had to the cutting and grinding mechanisms.

Referring to Figures 7, 8, and 9, the application of my invention to a so-called "fly-knife" type of cigarette cut-off is disclosed. The general features of a fly-knife cut-off will be found in the patent to Koerner, No. 1,573,616 dated February 16, 1926. As shown, the cutting mechanism comprises a rotatable disc 100 mounted on and rotating with a shaft 101 in the direction indicated by the arrow in Fig. 7. The knife itself comprises a simple curved or tapered blade 102 which extends radially from the periphery of the disc and is adapted to slash across a cigarette rod 103 which lies beyond the periphery of the disc, but within the path of the blade 102. The longitudinal or axial travel of a cigarette rod during the cutting action is taken care of by a synchronized axial movement of the disc along the shaft 101 during the cutting movement. Said axial movement of the disc is effected by any suitable reciprocatory means (not shown) which cause the

knife blade to travel with the cigarette rod during the cutting movement and thereby effect a perpendicular cut. The axial returning movement of the disc during the grinding action, which preferably takes place when the knife is diametrically opposite to the cigarette cutting position, is indicated by the arrows in Figs. 8 and 9.

It will be obvious that the fly-knife type of cut-off is inferior in operation and design to the cut-off hereinbefore described in connection with Figs. 1 to 6, principally because of the necessity for the axial movement of the fly-knife and disc, which introduces racking and eccentric movements into the machinery and requires additional mechanisms for effecting said movement. However, certain features of my present invention are applicable to cut-offs of the fly-knife type and when applied thereto eliminate the reciprocating grinding devices now used with such cut-offs.

As embodied, a grinding surface, indicated as an abrasive roller **105**, is mounted adjacent the path of movement of the cutting edge of blade **102** and is held stationary with respect to said movement, although the roller may rotate on its own axis if desired. The grinding surface is so positioned with respect to the path of movement of the curved cutting edge of the blade that said blade will sweep along and across the grinding surface and receive a uniform grinding action by virtue of its own movement. As will be clear from Fig. 9, as the blade **102** sweeps upwardly toward the grinder, the narrowest portion of the blade will contact with the nearer end of the inclined grinding surface. As the blade progresses upwardly, the disc **100** advances in the direction of the arrow, thereby bringing the wider intermediate portion of the blade in contact with the farther removed median portion of the grinding surface. Accordingly, the progressive rising and translatory movements of the knife-blade cause it to travel along the properly disposed grinding surface and thus undergo the desired grinding action. It will be clear that the position of the knife in the central view of Fig. 9 is substantially the same as that shown in Fig. 8. The lengths of the arrows in the successive positional views indicate the remaining amounts of return translatory movement the disc will undergo from the point of its rotation indicated.

It will be obvious that a flat disc similar to a grinding tool **20** disclosed in connection with the modification hereinbefore described may be used for the fly-knife cut-off in lieu of the grinding roller and vice versa.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:

1. In a cigarette cut-off, the combination of a rotating knife support, means for moving a cigarette rod across the plane of rotation of said support, a knife carried by said support, different parts of the cutting edge of the knife being disposed at varying distances from the center of rotation of the support whereby the cutting edge travels with and makes a cut normal to the cigarette rod, means actuated by a moving part of the cut-off mechanism for automatically feeding the knife blade relatively to the support to compensate for wearing away of the blade, and a stationary grinder in the path of the cutting edge and conformably contacting therewith.

2. A cigarette cut-off including in combination a revolving knife, a reciprocable ledger plate cooperating therewith, and means on the ledger plate for sharpening the knife.

3. A cigarette cut-off including in combination a revolving knife, a stationary grinder mounted in the path of movement of the knife, means for advancing the knife towards the grinder during the movement of the knife and transversely to its plane of rotation, a reciprocable ledger plate cooperating with the revolving knife, and additional means on the ledger plate for sharpening the knife.

4. Cigarette cut-off mechanism including in combination a rotatable knife blade movable through a longitudinally travelling cigarette rod to sever the rod into cigarette lengths, the cutting edge of the knife blade having a movement with the rod during the cutting action and thereby producing a perpendicular cross-cut, the knife blade being adjustably mounted in a rotatable carrier, and means actuated by a moving part of the cut-off mechanism for automatically feeding the knife blade relatively to the carrier to compensate for wearing away of the blade.

5. Cigarette cut-off mechanism including in combination a rotatable knife blade movable through a longitudinally travelling cigarette rod to sever the rod into cigarette lengths, the cutting edge of the knife blade having a movement with the rod during the cutting action and thereby producing a perpendicular cross-cut, a reciprocating ledger plate cooperating with the cutting edge of the knife during cutting operation, the knife blade being adjustably mounted in a rotatable carrier, and means actuated by a moving part of the cut-off mechanism for automatically feeding the knife blade relatively to the carrier to compensate for wearing away of the blade.

6. Cigarette cut-off mechanism including in combination a rotatable knife blade movable through a longitudinally travelling cigarette rod to sever the rod into cigarette lengths, the cutting edge of the knife blade having a movement with the rod during the cutting action and thereby producing a perpendicular cross-cut, a reciprocating ledger plate cooperating with the cutting edge of the knife during cutting operation, the knife blade being adjustably mounted in a rotatable carrier, an operating member co-axial with and capable of movement with relation to said carrier, and connections between the member and the knife blade for adjusting the knife on the carrier in response to the movement of the member while the carrier is rotating.

7. Cigarette cut-off mechanism including in combination a rotatable knife blade movable through a longitudinally travelling cigarette rod to sever the rod into cigarette lengths, the cutting edge of the knife blade having a movement with the rod during the cutting action and thereby producing a perpendicular cross-cut, a reciprocating ledger plate cooperating with the cutting edge of the knife during cutting operation, the knife blade being adjustably mounted in a rotatable carrier, an operating member co-axial with and capable of movement with relation to said carrier, connections between the member and the knife blade for adjusting the knife on the carrier in response to the movement of the member while the carrier is rotating, and manually operable means connected to said member to permit movement of said member by hand.

8. Cigarette cut-off mechanism including in combination a rotatable knife blade movable through a longitudinally travelling cigarette rod to sever the rod into cigarette lengths, the cutting edge of the knife blade having a movement with the rod during the cutting action and thereby producing a perpendicular cross-cut, a reciprocating ledger plate cooperating with the cutting edge of the knife during cutting operation, the knife blade being adjustably mounted in a rotatable carrier, an operating member co-axial with and capable of axial movement with relation to said carrier, and connections between the member and the knife blade for adjusting the knife on the carrier in response to the movement of the member while the carrier is rotating.

9. Cigarette cut-off mechanism including in combination a rotatable knife blade movable through a longitudinally travelling cigarette rod to sever the rod into cigarette lengths, the cutting edge of the knife blade having a movement with the rod during the cutting action and thereby producing a perpendicular cross-cut, a reciprocating ledger plate cooperating with the cutting edge of the knife during cutting operation, the knife blade being adjustably mounted in a rotatable carrier, and means coaxial with said carrier and actuated by a moving part of the cut-off mechanism for automatically feeding the knife blade relatively to the carrier to compensate for wearing away of the blade.

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