Oct. 31, 1933. W. E. MOLINS ET AL 1,933,181

TOBACCO CUTTING MACHINE

Filed July 28, 1931 3 Sheets-Sheet 1

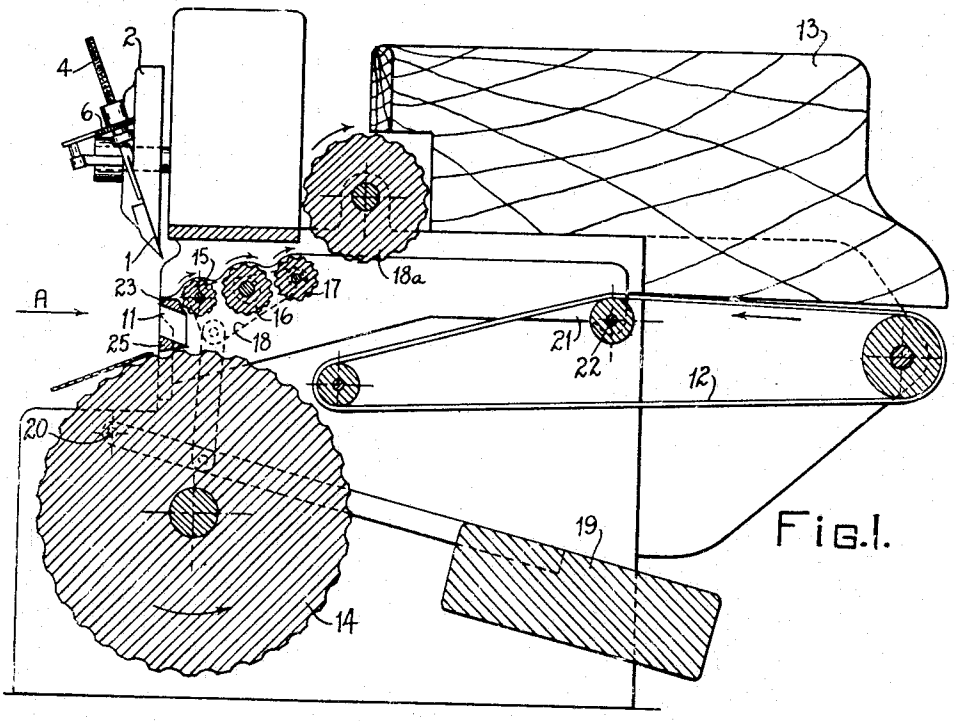


Fig. 1.

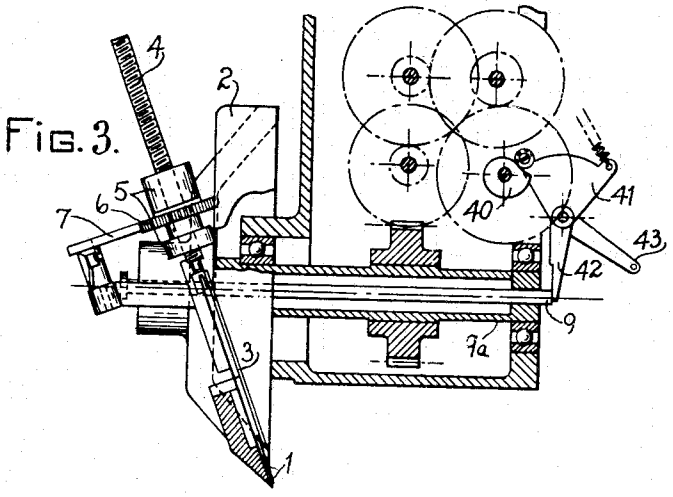


Fig. 3.

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TOBACCO CUTTING MACHINE

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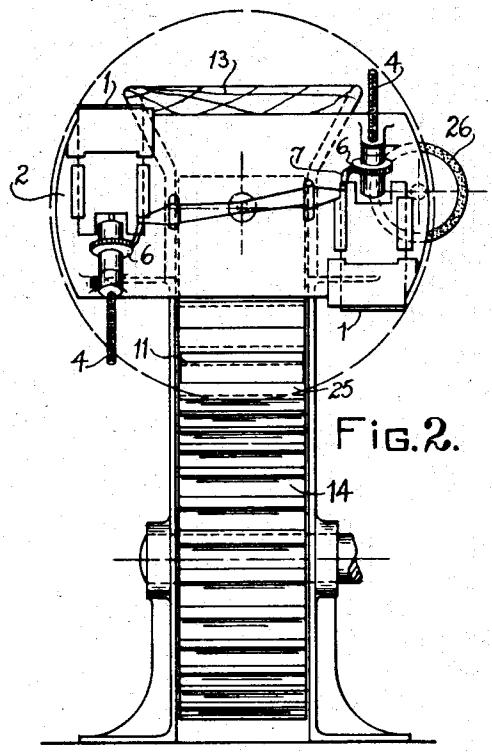


Fig. 2.

Fig. 5.

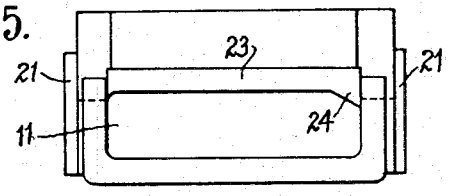
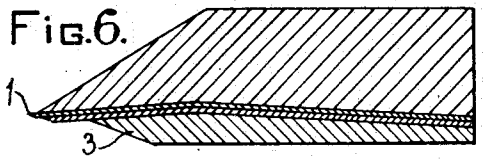


Fig. 6.



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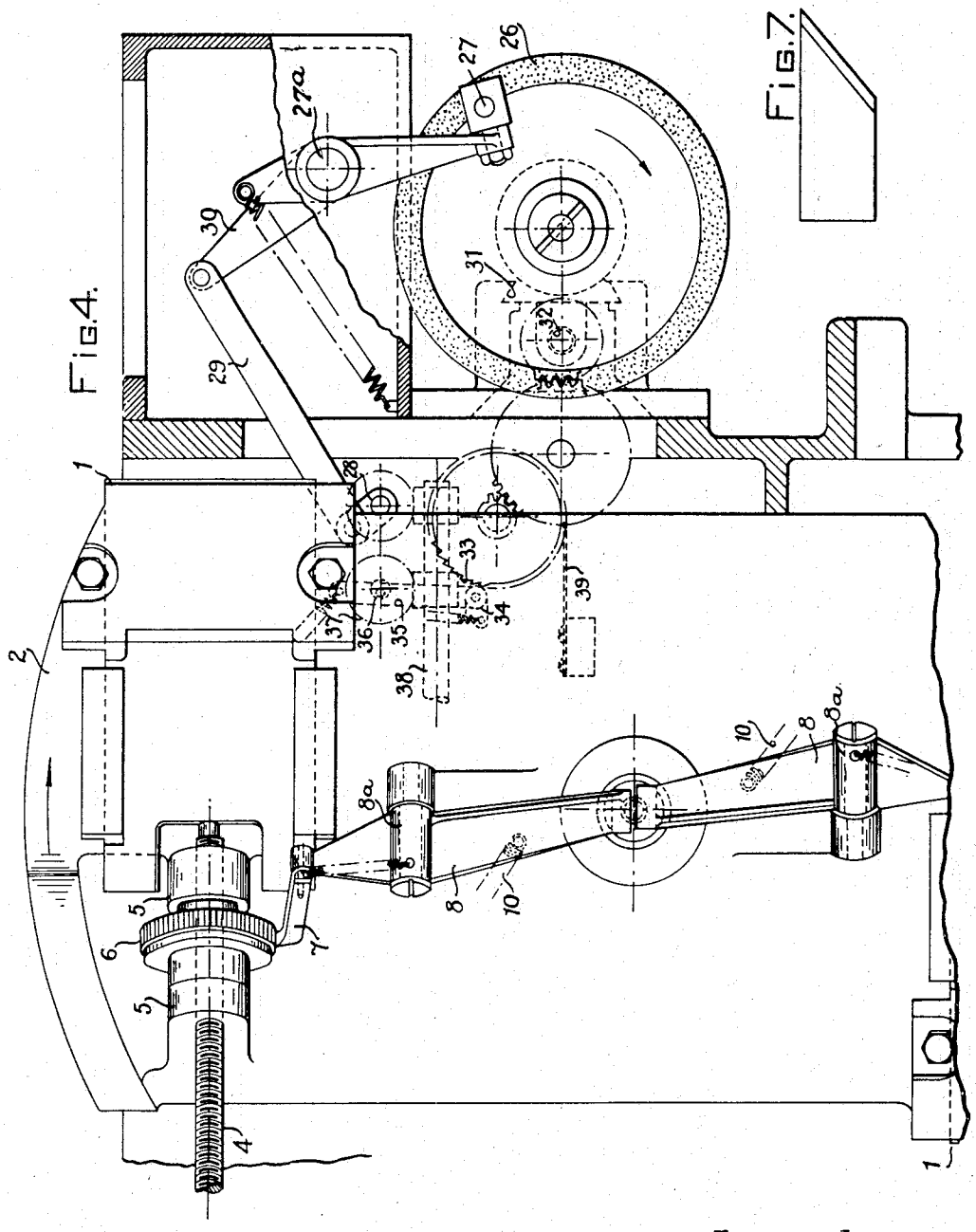
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Fig. 7.



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TOBACCO CUTTING MACHINE

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Application July 28, 1931, Serial No. 553,654, and in Great Britain August 13, 1930

4 Claims. (Cl. 146—109)

This invention relates to tobacco cutting machines, and has for its object to provide a rotary tobacco cutting machine wherein the cutting blade (or blades) is kept constantly sharp whilst the machine is working, thus avoiding the waste of time usually incurred in stopping the machine to sharpen the blades.

Owing to the fact that the edge of the blade always possesses a keenness not attained in previous machines, it is found possible to cut leaves with the stems still attached without detracting from the quality of the cut tobacco as the stems are sliced into extremely thin slices, easily incorporated with the remainder of the cut tobacco.

A stem inadvertently included in the leaves fed to a tobacco cutting machine of the usual kind is generally pulled bodily out of the "cheese" as the knife strikes the stem or at least is broken into relatively coarse fragments which spoil the tobacco.

The present invention comprises a rotary tobacco cutting machine having means for automatically grinding the cutting blade or blades during the rotation of the same.

Further, the invention comprises a method of cutting tobacco wherein the leaf and the stems, if any, are cut into shreds of substantially the same length so as to produce a substantially homogeneous product.

The invention will be more particularly described with reference to the accompanying drawings, in which:—

Fig. 1 is a sectional elevation of the invention, the mechanism carrying the cutting blade being shown in full.

Fig. 2 is a front elevation of Fig. 1 in the direction of the arrow "A".

Fig. 3 is an elevation, partly in section, of the mechanism carrying the cutting blade and the associated parts.

Fig. 4 is a front elevation of the mechanism carrying the cutting blade showing also the method of grinding the blade.

Fig. 5 is a front elevation of the mouth through which the tobacco leaf is fed to the cutter.

Fig. 6 is a section of a modified form of cutter holder.

Fig. 7 is a detail of one form of cutting blade.

Referring to the drawings which show a tobacco cutting machine having two blades, the blades 1 are mounted on a rotatable member or carrier 2 in such a manner that they project through the inner face of the carrier at an angle as shown in Figs. 1 and 3.

Each blade is mounted in a slide 3 which has attached thereto a screwed rod 4 which is mounted in bearings 5 and has a nut in the form of a ratchet wheel 6 mounted on the screw between the bearings 5 so that the rotation of the ratchet wheel will feed the blade through the carrier so that it projects on the rear side thereof.

A pawl 7 is provided oscillated by a lever 8 pivoted at 8^a which is in turn rocked about its pivot by a rod 9 passing through the hollow spindle 9^a on which the knife carrier 2 is mounted. The lever 8 is returned by a spring 10, Fig. 4. The carrier rotates so that the cutting blade passes across a mouth or outlet 11 through which compressed tobacco is forced.

In the construction shown, the tobacco in the form of leaves is laid upon a belt 12 moving in the direction of the arrow, the belt running at the bottom of a box or trough formed by boards 13. A large fluted roller 14 is mounted as shown in Fig. 1 and receives the tobacco leaves from the belt.

Three small fluted rollers 15, 16 and 17 are carried in bearings on a frame 18 and so arranged that the under rim surfaces are approximately in a line which slopes downwards towards the cutting mouth. Another fluted roller 18^a assists in feeding the leaves into the space between roller 14 and the rollers 15, 16 and 17.

The passage for the tobacco is of a wedge shape as shown in Fig. 1 so that the leaves are firmly compressed before they are cut. The pivoted frame 18 carrying the top rollers 15, 16 and 17 is arranged to move around the centre of the roller 15 and is pulled downwardly by a weight 19 pivoted at 20 to compress the tobacco, the arrangement permitting the frame to rise when necessary to accommodate any minor irregularities in the feed of the tobacco.

In addition to this, the frame 18, together with the three rollers, are all attached to a bracket 21 pivoted at 22. The bracket 21 also carries the upper lip 23 of the mouth 11 which is separate from the body of the mouth so that the weight 19 pulls down the lip 23 and gives the required pressure on the tobacco at the cutting point forming it into a solid mass technically known as a "cheese".

Fig. 5 shows the arrangement of the two portions of the mouth and it will also be observed that the right hand top corner which first receives the shock of the cutting blade is filled in

by a piece 24 in order to obtain a high degree of compression at this corner, as otherwise the tobacco is liable to be torn away instead of being properly cut.

The member on which the lower lip 25 of the mouthpiece is formed lies fairly close to the rim of the fluted roller 14, (see Fig. 1) and forms a scraper for removing any large fragments of tobacco which adhere to the fluted roller.

In Fig. 1 the flutes are shown comparatively large in view of the scale of the drawings, but in actual practice the flutes would be of about ¼" pitch and are cut at an angle to the axis of the roller 14 so that the roller resembles an ordinary helical gear except that the flutes are quite shallow.

After the cutter has passed the tobacco outlet and cut off a narrow slice of tobacco, the blade passes across the surface of a grinding apparatus in the form of a cup emery wheel 26 so that at each revolution of the disc, the blades rub in contact with the said wheel and maintain their cutting edge. The wheel is kept true by a diamond 27 carried on a lever pivoted at 27^a and which is automatically reciprocated across the face thereof by the crank 28, link 29 and lever 30. In order to compensate for the wear of the emery wheel due to the grinding of the blade and the truing of the wheel, the wheel is carried in a bearing mounted on a slide 31 which is automatically fed forward by a screw 32 rotated through the gearing shown in Fig. 4 by a ratchet wheel 33. The ratchet wheel is rotated by a pawl 34 carried on a pivoted lever 35 which is oscillated by an eccentric 36 driven by a gear 37. The gear 37 and the gear which drives the crank 28 are both driven from a shaft 38 through helical gears as indicated in Fig. 4, the shaft 38 being connected to the main drive of the machine by other gearing, not shown. A band brake 39 is fitted to the ratchet wheel 33 to prevent backlash.

The ratchet wheel which feeds each blade forwardly may be operated automatically as shown in Fig. 3 by a cam 40 which operates a lever 41, to which is connected another lever 42 which periodically presses on the rod 9. The rate of feeding is altered by a change wheel incorporated in the gearing which drives the cam 40.

In addition to this a hand feeding device is preferably provided for use when the machine is first started up in order to feed the cutting blades to any desired amount so that they may be correctly ground before cutting commences.

This hand feed may be conveniently arranged by attaching a hand lever 43 to the spindle carrying the levers 41 and 42. In order to keep the blade rigid, and yet permit the feeding operation to take place, the blade may be fed through a holder formed in the slide 3 which has a bent passage-way for the blade; this is shown in Fig. 6.

The blade is made from a flat steel plate and when it is forced through the bent passage-way by the screw, the force exerted by the passage-way on the straight blade in bending the same is sufficient to keep the blade rigid during the cutting operation, and yet permit the necessary feed to take place.

In some instances the blade may be shaped as shown at Fig. 7 so that the cutting edge is at an angle to the width of the plate from which the blade is formed so that a comparatively wide cutting blade is obtained from a relatively narrow strip of steel.

What we claim as our invention and desire to secure by Letters Patent is:—

1. In a rotary tobacco leaf cutting machine, the combination with a pair of cooperating cutting devices, of means for feeding leaf tobacco to said devices, one of said devices comprising a rotatable element and a cutting blade carried with said element and movable thereby in a circular path about the rotational axis of said element, blade sharpening means positioned adjacent the path of movement of said blade for intermittent engagement therewith during normal rotation of said element to cut the tobacco leaf, and means driven by said machine in timed relation to the rotational movement of said element for feeding the blade with respect to said element and said cooperating cutting device to compensate for wear.

2. In a rotary tobacco leaf cutting machine, the combination with a pair of cooperating cutting devices, of means for feeding leaf tobacco to said devices, one of said devices comprising a rotatable element and a cutting blade carried with said element and movable thereby in a circular path about the rotational axis of said element, blade sharpening means positioned adjacent the path of movement of said blade for intermittent engagement therewith during normal rotation of said element to cut the tobacco leaf, means driven by said machine in timed relation to the rotational movement of said element for advancing said blade sharpening means toward the path of movement of said blade to compensate for wear, and means driven by said machine in timed relation to the rotational movement of said element for feeding the blade with respect to said element and said cooperating cutting device to compensate for wear.

3. In a cutting device, the combination with a substantially flat flexible blade, of a holder for said blade, forming a blade receiving slot having a depth approximating the thickness of the blade and having a bend therein extending transversely of the blade and substantially parallel to the cutting edge thereof whereby the blade is deformed by flexing when lying within the slot, and means engaging that edge of the last named blade remote from said cutting edge to feed the same toward the cooperating blade to compensate for wear.

4. In a cutting device, the combination with a flat blade and a cooperating blade member, of blade supporting means for said flat blade, said blade supporting means being provided with a blade receiving slot having a bend therein extending transversely of the blade, and substantially parallel to the cutting edge thereof, whereby the flat blade is firmly gripped and held against gravitational movement, and means engaging that edge of the blade remote from the said cutting edge to feed the same toward the cooperating blade member to compensate for wear.

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