

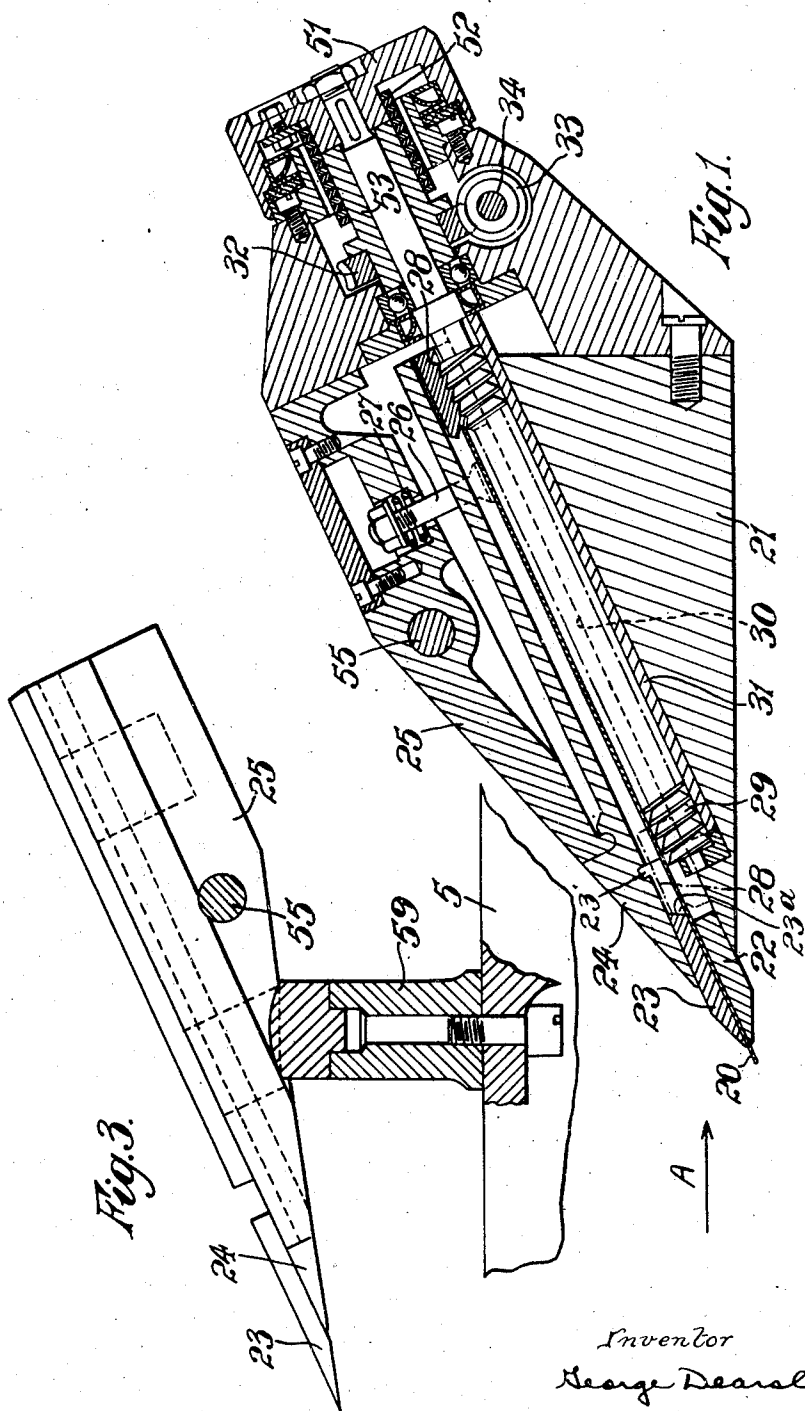
Oct. 11, 1949.

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DEVICE FEEDING KNIVES IN ROTARY
TOBACCO CUTTING MACHINES

2,484,403

Filed Dec. 18, 1947

3 Sheets-Sheet 1



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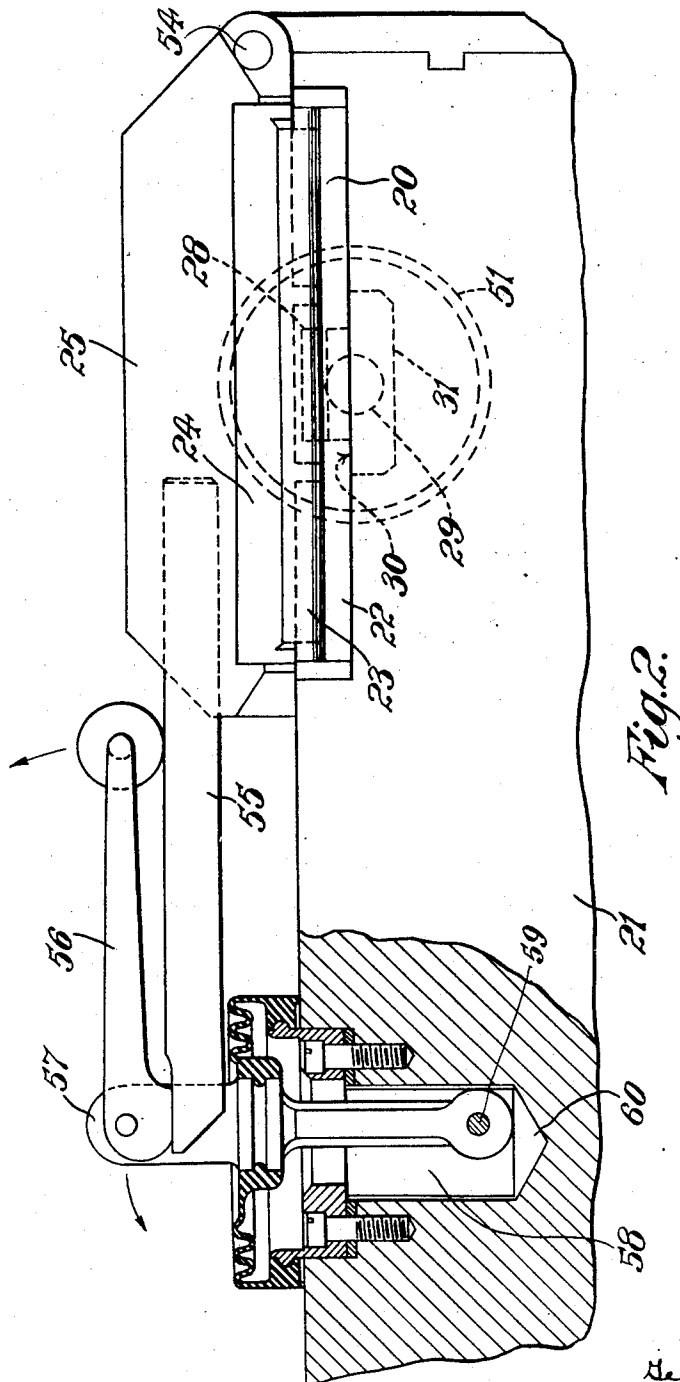
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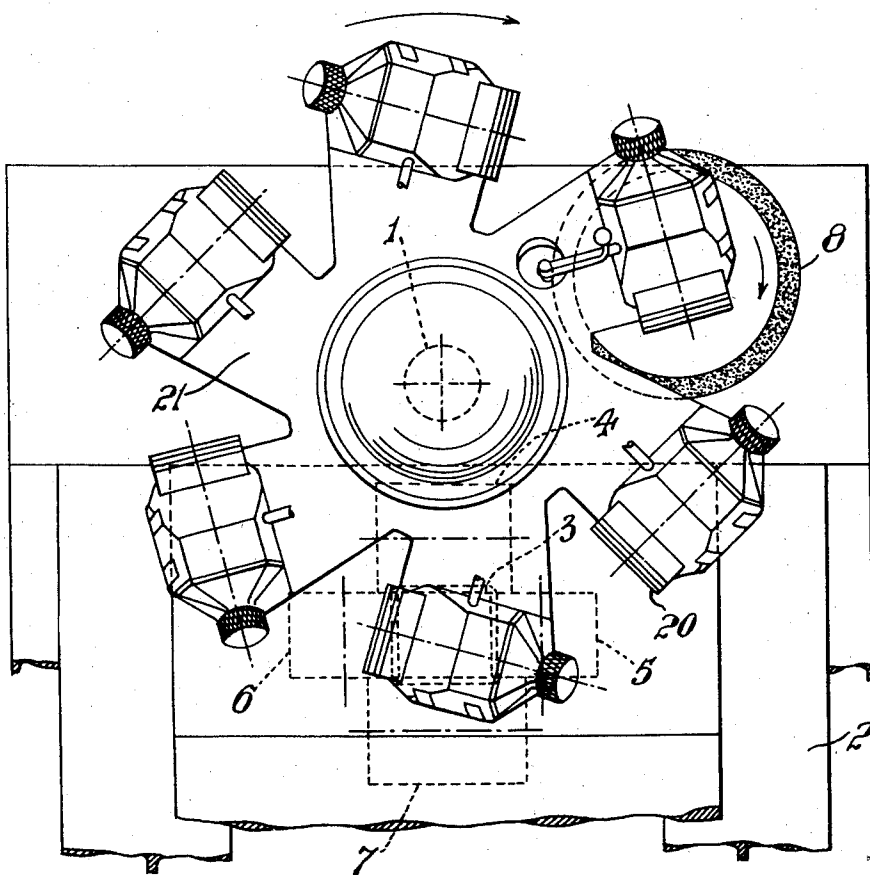


Fig. 4.

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UNITED STATES PATENT OFFICE

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DEVICE FEEDING KNIVES IN ROTARY
TOBACCO CUTTING MACHINES

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Molins Machine Company Limited, London,
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2 Claims. (Cl. 146-108)

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This invention concerns improvements in or relating to devices for feeding knives in rotary tobacco cutting machines and refers more particularly to devices of the kind in which a half-nut is traversed by screw and when, for example, the limit of movement is reached, the half-nut is lifted from the screw and replaced at the beginning of the thread. Devices of this kind are used in rotary tobacco cutting machines for the purpose of feeding the knives forwardly as they wear during the operation of the machine. An arrangement of the kind is illustrated in British Patent Specification No. 526,902. It will be observed on referring to the illustration that when the half-nut has fed the blade forwardly as far as possible, the nut will be jammed by further rotation of the screw, against the end of the recess in which the half-nut moves. When this occurs a clutch in the screw driving mechanism slips and no damage can result, but before the half-nut can be removed from the screw so that a new blade can be inserted it is necessary to reverse the movement of the screw in order to release the jammed nut. This is a tedious and slow operation because the knives on such machines are advanced by very slow gearing and a considerable amount of time is taken up in replacing the knives on a machine.

According to the invention there is provided a device of the kind referred to comprising a rotatable screw engaging a half-nut which is caused to move along parallel to the axis of the screw as the latter is rotated, a clamp hinged or otherwise arranged so that it may be removed from engagement with the knife, said clamp comprising a stop for limiting the nut traverse having a sloping face which stops the nut on engagement therewith, the slope being such that the slightest movement of the clamp away from the nut releases the pressure between said face and the nut.

A device, in accordance with the invention, for feeding knives in rotary tobacco cutting machines will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a section through the cutting head of a rotary tobacco cutting machine showing the blade feeding devices.

Figure 2 is an elevation, partly in section, of a fragment of the cutting head, the view being in the direction of the arrow A, Figure 1.

Figure 3 is a diagram showing a blade cover plate in the open position.

Figure 4 is a front elevation of a rotary to-

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bacco cutting machine embodying the invention, the frame being broken away.

Referring to Figure 1, the blade 20 is clamped to the cutting head 21 by being gripped between a clamp 22 fixed to the head and a co-operating clamp 23 fixed to a clamp plate 24. The latter is attached to a cover plate 25 by screws 26 and springs 27 so that clamping takes place under strong spring pressure which holds the blade firmly but permits the blade to be fed outwards between the clamps.

A half-nut 28 engages a feed screw 29 and when the screw is rotated the nut moves along, being guided by flat surfaces 30 which form the upper surfaces of a guide block 31 which supports the feed screw. The screw has a buttress thread as shown, and the leading face is preferably undercut whereby the operative feeding movement of the screw tends to draw the nut into closer contact with the thread. The nut is shown in full lines at the top position and is also shown at its lowest position, in chain lines.

A wormwheel 32 is supported at one end of the screw and driven by a worm 33 mounted on a shaft 34. The coupling between the wormwheel and screw is described later. The wormshaft 34 is driven in any convenient way according to the design of the machine and a suitable construction is described and illustrated in the copending United States application Serial No. 765,392. The driving mechanism always comprises a clutch, usually a friction clutch, so that if the resistance of the blade to movement becomes excessive, generally because the nut has reached the end of its traverse, the clutch can slip and no harm is done to the mechanism.

The inner end of the clamp 23 is cut away at 23a leaving end portions shown at 23'. The cutting away of the inner end of the clamp is so effected that the end face or shoulder makes an obtuse angle with the base of the clamp plate 24. It will be seen therefore that when the leading end of the nut meets this shoulder it will jam against it and the clutch in the screw driving mechanism will slip, but immediately the cover 25 is moved the slightest distance away from the screw, the end pressure on the nut 28 will be released and the nut can be lifted off the thread and returned to its initial position when a new knife is fitted. In view of the shape of the end of the recess it will be seen that the pressure between the nut and clamp does not hinder in any way the free movement of the clamp when it is to be moved away from the knife.

In order to permit each blade to be fed independently for feeding it up to the gauge or for any other purpose a hand knob 51 is fixed on the end of each screw. The knob has attached thereto a spiral spring 52. The spring closely embraces a sleeve 53 on which the wormwheel is fixed and when the wormwheel is rotated the spring winds up and grips the sleeve thereby transmitting the motion to the hand knob and thence to the screw. When however, the knob is turned by hand to feed the blade forwards it is of course moved in the same direction and the spring slips on the wormwheel sleeve.

Figure 2 shows how the blade supporting structure is fixed on the cutting head 21. The cover plate 25 is hinged at 54 near the outer edge of the cutting head and a rigid rod 55 projecting therefrom is held by a hand lever 56 pivoted at 59 to a lug 57 which is pivoted in a fork member 58 bolted in a recess 60 in the head 21. The operative end of the hand lever is eccentric and has a flat face which engages with a flat face of the rod 55 when the cover plate is in the closed position.

When the hand lever 56 is moved to release the rod 55, and the lug 57 and lever 56 swung to the left out of the path of the end of the rod, the cover plate 25 may be swung over on its pivot to the position shown in Figure 3 to expose the blade for removal or inspection. A resilient stop 53, is provided, attached to the machine frame 5, against which the cover plate may strike without injury.

The leading end of the nut may be shaped to the same angle as the end of the recess in the clamp.

Figure 4 shows the essential parts of a rotary tobacco cutting machine for which the invention is suitable. The cutting head 21 rotates about a shaft journaled in a frame 2, in a clockwise direction and the blades 20 sweep across a mouth 3 through which a cheese of compressed tobacco leaves is forced by endless conveyors 4, 5, 6 and 7. The knives are continually ground by passing across a grinding wheel 8.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a rotary tobacco cutting machine of the class described, a cutting device comprising, in combination, a cutting head, a knife blade guided for advancing feeding movement along said head, a clamp adapted to grip said blade against said head, means for feeding the blade forwardly to compensate for wear or the like, said feeding means comprising a rotatable screw, a half-nut operatively engaged with said screw and contacting said blade for advancing the latter when the

screw is turned, a closure member normally adapted to cover said screw and nut and means for removing the clamp for access to the half-nut for re-positioning it upon the rearward portion of the screw, a stop shoulder on said clamp against which the half-nut abuts at the end of its feeding movement, the abutment face of said shoulder being beveled in a direction forwardly and toward the axis of said screw, whereby the slightest opening movement of said clamp away from said screw releases any jamming pressure between the half-nut and the stop shoulder, and dispenses with the necessity of backing off the screw to release the jam.

2. In a rotary tobacco cutting machine of the class described, a cutting device comprising, in combination, a cutting head, a knife blade guided for advancing feeding movement along said head, a clamp adapted to grip said blade against said head with resilient pressure strong enough to prevent dislodgment during operation but permit the forward feed of the blade, means for feeding the blade forwardly to compensate for wear or the like, said feeding means comprising a rotatable screw, a half-nut operatively engaged with said screw and contacting said blade for advancing the latter when the screw is turned, said clamp comprising a closure member normally adapted to cover said screw and nut, and quick-releasable means for removing the closure for access to the half-nut for re-positioning it upon the rearward portion of the screw, a stop shoulder on said closure against which the half-nut abuts at the end of its feeding movement, the abutment face of said shoulder sloping forwardly and inwardly toward the axis of said screw, whereby the slightest opening movement of said closure at right angles to the axis of said screw releases any jamming pressure between the half-nut and the stop shoulder, and dispenses with the necessity of backing off the screw to release the jam.

GEORGE DEARSLEY.

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

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