Oct. 11, 1932. C. W. GOOCH, JR 1,881,494

STEM CUTTING MECHANISM FOR TOBACCO STEMMING MACHINES

Filed Dec. 19, 1931 4 Sheets-Sheet 1

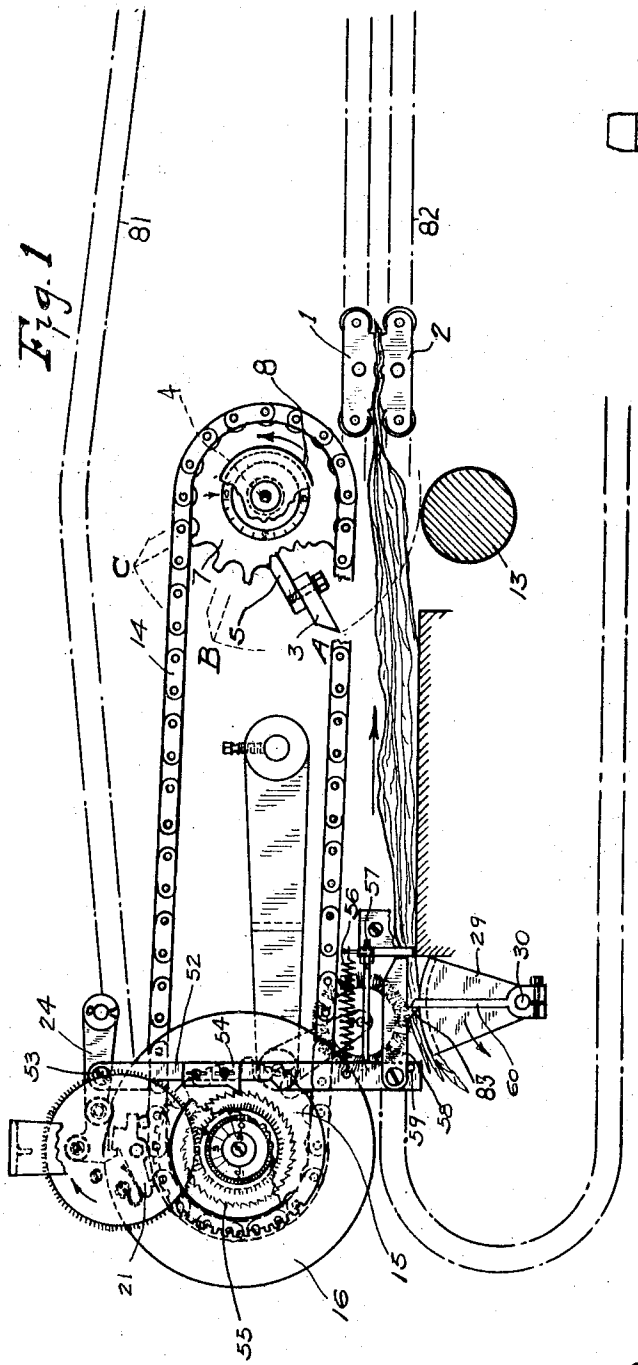

Fig. 1

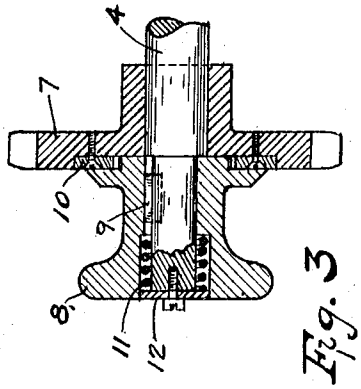

Fig. 3

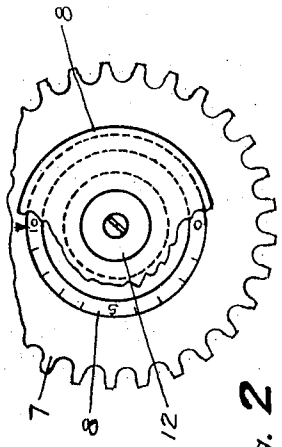

Fig. 2

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STEM CUTTING MECHANISM FOR TOBACCO STEMMING MACHINES

Filed Dec. 19, 1931 4 Sheets-Sheet 2

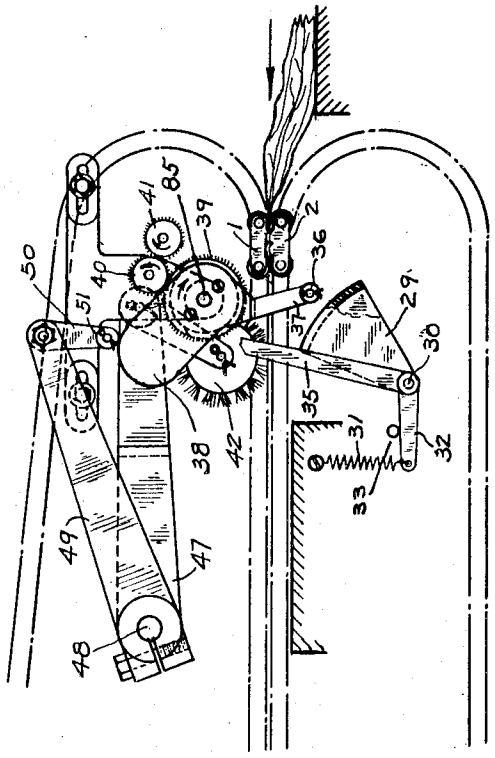

Fig. 4

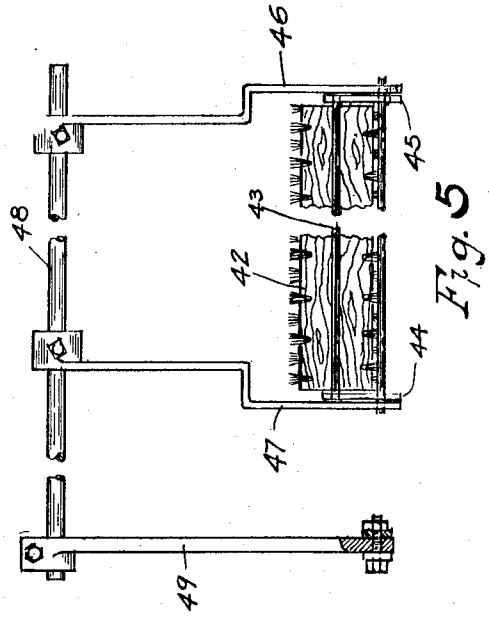

Fig. 5

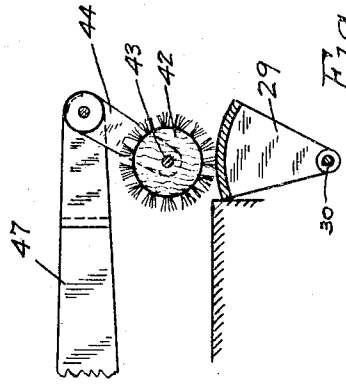

Fig. 6

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STEM CUTTING MECHANISM FOR TOBACCO STEMMING MACHINES

Filed Dec. 19, 1931 4 Sheets-Sheet 3

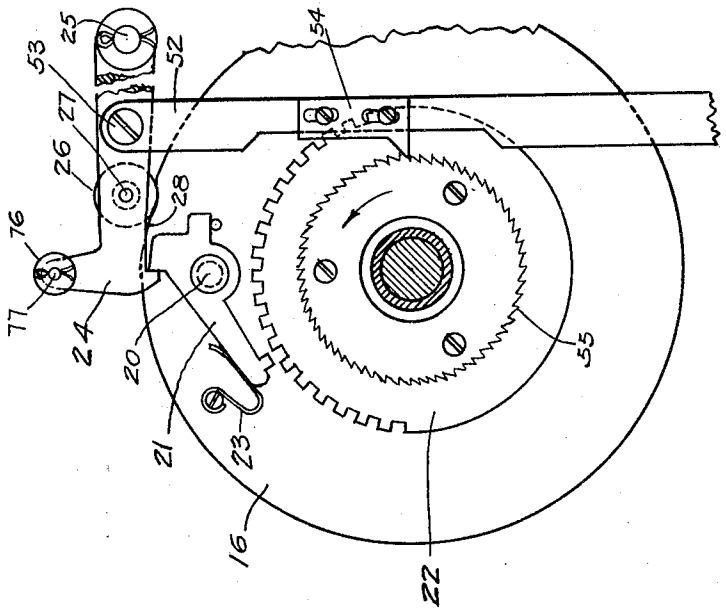

Fig. 7

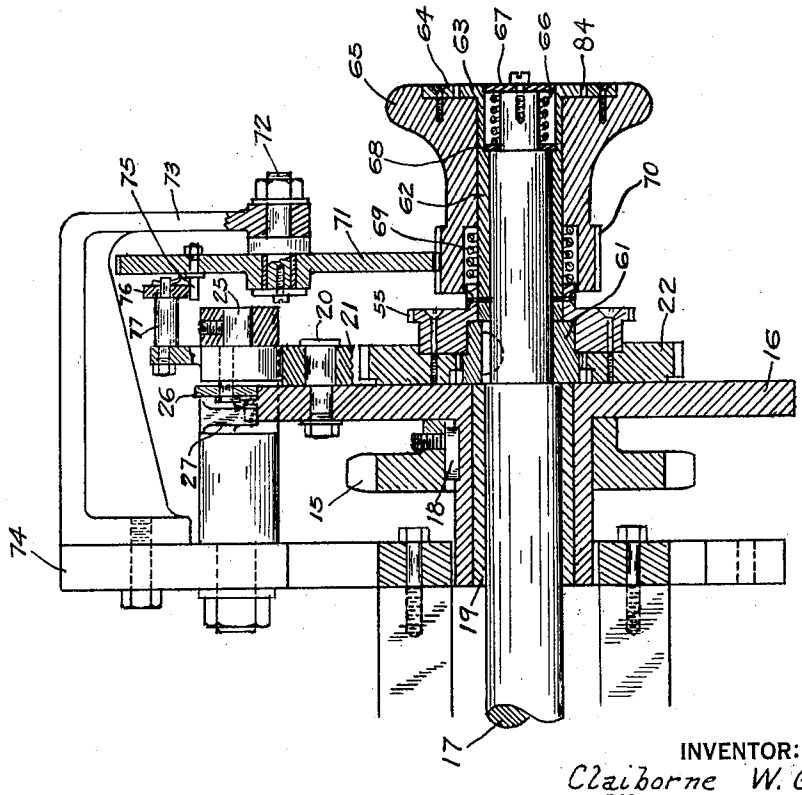

Fig. 8

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STEM CUTTING MECHANISM FOR TOBACCO STEMMING MACHINES

Filed Dec. 19, 1931 4 Sheets-Sheet 4

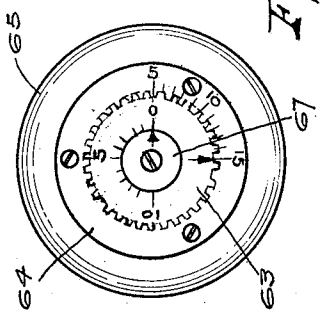

Fig. 9

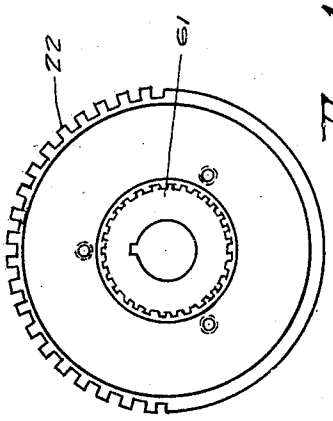

Fig. 10

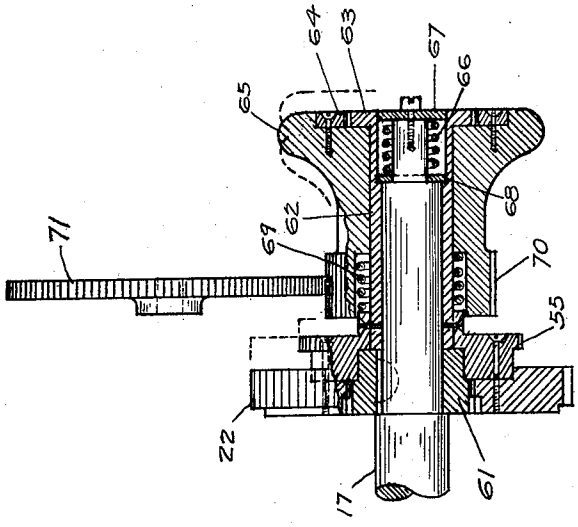

Fig. 11

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Patented Oct. 11, 1932 1,881,494

UNITED STATES PATENT OFFICE

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STEM CUTTING MECHANISM FOR TOBACCO STEMMING MACHINES

Application filed December 19, 1931. Serial No. 582,151.

The present invention relates to an improvement in timing mechanisms of stem cutters or creasers for tobacco stemming machines.

The present invention provides a feeler or measurer, for measuring the length of leaves, of improved design and of an entirely different type which eliminates many difficulties of a practical nature experienced in the operation of known machines. There are further provided certain additional refinements shown in the drawings and explained in detail.

It is an object of the present invention to utilize the tension in the tobacco leaves in a device to prevent actuation of the knife driving mechanism of the stemming machine until such tension is removed from the device. The device therefore utilizes the tension of the leaves being pulled through the machine and any loose leaves or scrap tobacco which may be carried along with a charge of the leaves, but are not gripped by the grippers, will not affect its operation.

The invention is illustrated on the drawings in which like reference numerals indicate corresponding parts throughout and in which,

Figure 1 is a side view of the leaf entry end of a stemming machine showing the principal parts,

Fig. 2 is a partial side view of a detail of a sprocket wheel and dial wheel,

Fig. 3 is a cross-sectional view of the detail of Fig. 2,

Fig. 4 is a side view of the leaf entry end of the machine as seen from the other side from that shown in Fig. 1,

Fig. 5 is a front view of the feeler brush and its mounting,

Fig. 6 is a side view of the brush and its cooperating segment,

Fig. 7 is a side view of the cam and its associated parts,

Fig. 8 is a cross-sectional view of the cam, the clutch and associated parts.

Fig. 9 is a side view of the hand wheel,

Fig. 10 is a side view of the ratchet wheel, and

Fig. 11 is a cross-sectional view of the hand and ratchet wheels of Figs. 9 and 10.

1 and 2 are the cooperating grippers which are mounted on the usual chains 81 and 82 and which grip the butt ends of the tobacco leaves. 3 is the knife blade which is fastened to shaft 4 by suitable arms 5. This shaft 4 revolves intermittently in rigid bearings (not shown) and is driven by a sprocket wheel 7 through an adjustable coupling composed of a dial wheel 8, Figs. 2 and 3, slidably mounted on shaft 4 and keyed thereto by key 9. Dial wheel 8 meshes with its coupling 10 which is fastened to sprocket 7 and is normally held in engagement therewith by spring 11 and washer 12.

The knife blade 3 cuts the tobacco stems against a roller 13 both of which have the same length and extend across the machine.

Chain 14 connects sprocket wheels 7 and 15, the latter being fastened to a cam 16, Fig. 8, which is free to turn on shaft 17. In this construction the sprocket wheel 15 is keyed to cam 16 by a key 18 and cam 16 is provided with a bushing 19.

A stud 20 is fastened to the face of the cam 16, Figs. 7 and 8, and carries a pawl 21 which by means of a spring 23 is forced to engage the teeth of a ratchet wheel 22 when the knife is to be set in motion. When the pawl 21 and the ratchet wheel 22 are not engaged the pawl is held by a hook 24 pivoted on the stud 25. In the position shown in Fig. 7, the roller 26 mounted on the stud 27 fastened in the hook 24 is depressed in the depression 28 of cam 16 but when the hook is lifted, by a mechanism to be described, pawl 21 is forced down by its spring 23 and thereby engages the ratchet 22 which runs continuously, in the direction of the arrow. This starts the knife drive in motion and roller 26 and hook 24 are held up by the circular part of cam 16 until one complete revolution thereof, whereupon the roller 26 again drops into the depression 28 and the hook 24 catches and disengages the pawl 21 from the ratchet 22, thereby stopping the motion of the knife.

The earlier or later release of pawl 21 by hook 24 will cause the pawl 21 to engage different teeth of ratchet wheel 22 and thereby time the knife motion earlier or later rela-

tive to the grippers 1 and 2. The lifting of the hook 24, Fig. 1, is controlled by a segment 29 secured to the shaft 30 which is pivoted in suitable bearings, not shown. Normally the segment 29 is maintained in pulled back position against a stop 33, Fig. 4, by a spring 31 and arm 32. The segment 29 is moved forward by a roller 36 into the position shown in Figs. 1 and 6 just after grippers 1 and 2 have passed over it. Roller 36 is fastened to an arm 37 and cam 38 both of which are driven by gears 39, 40 and 41 making one revolution for each time that a pair of grippers 1 and 2 pass over the segment.

Cooperating with the segment 29 is a brush 42, Figs. 4, 5 and 6, rotatably mounted on a shaft 43 and swinging freely by means of the arms 44 and 45 from a pair of arms 46 and 47. The arms 46 and 47 are secured to a shaft 48 suitably mounted in bearings, not shown, and are adapted to be raised and lowered by the cam 38 through arms 49 and 50 and roller 51 so that brush 42 will clear the grippers 1 and 2. Arms 49 and 50 are rigidly secured together.

The mechanism for tripping the hook 24 to release the pawl 21 comprises the following elements. A rod 52, Figs. 1 and 7, is hinged to the hook 24 by means of a stud 53. This rod 52 is provided with a toothed projection 54 which is normally held clear of or away from the continuously rotating ratchet wheel 55 by a spring 56 which urges the rod against a stop 57 through the intermediary of a latch 58 which is hinged to the rod 52 and held in a horizontal position by a stop pin 59. The latch 58 has a lip 83 projecting downwardly therefrom which is in the path of a finger 60 secured to the ratchet shaft 30 on which the segment 29 is also secured. When the segment 29 is permitted to fall back in the direction of the arrow, Fig. 1, the finger 60 will cause tooth 54 to engage a cooperating tooth of the actuating ratchet wheel 55, the movement of which will lift the hook 24 and set the knife drive sprocket wheel in motion.

The ratchet wheels 22 and 55 are assembled together as shown in Fig. 8, the ratchet 2 being provided with internal teeth normally engaged with a gear 61 which is keyed to the driving shaft 17, the two together forming an adjustable coupling or clutch. Ratchet 55 is secured to a sleeve 62 on the outer end of which there is provided a flange 63 having clutch teeth 84 similar to the gear 61. The teeth of the flange 63 engage internal teeth of the ring 64 secured in the end of a hand wheel 65. A compression spring 66 is provided between a washer 67, which is secured to the end of the shaft 17, and a collar 68 secured to the sleeve 62. This holds the assembly 22, 55, 62, 64 and 65 firmly against the face of the cam 16 and maintains the internal and external teeth of wheel 22 and gear 61 engaged. A compression spring 69 maintains the internal and external teeth of flange 63 and ring 64 in engagement.

The hand wheel 65 is provided with gear teeth 70 which mesh continuously with a gear wheel 71. The gear ratio of gears 70 and 71 is such that the gear 71 makes one revolution for each cycle of the grippers, and the gear wheel 71 turns on a pin 72 which is secured in a bracket 73 bolted to a part of the machine frame 74. A pin 75 is secured in the gear wheel 71 and as this pin reaches its top position it will lift the roller 76 which is secured to the hook 24, Fig. 7, by means of a pin 77 unless the knife drive is in motion in which case the hook 24 will have been raised and held up by the roller 26 on the cam 16 as described in the foregoing.

The operation of the mechanism is as follows:

Tobacco leaves are fed into the machine and caught by their butt ends between grippers 1 and 2, Fig. 4. As these grippers move in the direction of the arrow the cam 38 raises the brush 42 out of their path and then allows it to descend upon the tobacco leaves. In the meantime the segment 29 has been cocked forward by the motion of the roller 36 which then releases it and passes on. The tobacco leaves as they are pulled along over the segment 29 are held down thereon by the brush 42, Fig. 1. The tension or pull of the leaves on the segment 29 maintains it in the forward position since this overcomes the pull of the spring 31 until the tips of the leaves have been pulled out from between the brush 42 and the segment 29. The spring 31 then pulls the segment back together with the finger 60, Fig. 1, in the direction of the arrow whereby the finger 60 engages the lip 83 to thus move the latch 58 to the left. This results in the movement of the rod 52 together with the tooth 54 which latter engages a tooth of the ratchet wheel 55 to lift the hook 24 thus releasing the pawl 21. The pawl 21 thus released drops into the nearest tooth of the ratchet 22 and the knife 3 will then start its cutting movement, it being driven by sprocket wheels 15 and 7 and chain 14. The knife creases or cuts the stems of the tobacco leaves and where mention is made of weakening or transversely weakening the stem it is to be understood that such weakening includes the cutting or creasing or both of the stems. It is obvious that the timing of the knife is in this manner and by these parts regulated by the length of the leaves being fed into the machine. The cut on the stem of the leaf by the knife will always occur at a predetermined distance from the tip end of the leaves and this will determine the amount of stem remaining in the leaf.

According to the present invention provision is made for adjustment so that any de-

sired length of stem can be left in the leaf. As shown in Fig. 1 the knife 3 is stopped at the lowest position A, leaving only sufficient space for the grippers 1 and 2 to pass thereunder. This setting will leave the maximum length of stem in the leaf. By pulling out the hand wheel 8, Figs. 2 and 3, the knife may be set at any desired position such as dotted line positions B or C and suitable dial graduations which may be marked on the hand wheel to indicate inches. When the hand wheel 8 is released the clutch is reengaged in the new position which is chosen for any length of stem desired to be maintained in the leaf.

A corresponding adjustment is made with the hand wheel 65, Figs. 9, 10 and 11, by pulling it out and setting the arrow on the disc 67 to the same reading as that of the dial on hand wheel 8. This corresponding adjustment is necessary to place the teeth on the ratchet 22 in proper relation to the new setting of the knife shaft. It can readily be seen that if the proper relative settings are maintained it will be impossible for the knife 3 to cut into the grippers 1 and 2 and cause any damage to the machine.

The third adjustment is for setting the wheel 71, Fig. 8, so that its stud 75 will lift the hook 24 and set the knife in motion at any desired time. This setting is necessary in cases when it is desired to limit the length of stem that will be taken out or when the measuring mechanism is to be disconnected and a definite length of stem taken out regardless of the length of the leaves. This setting is made by pushing in the hand wheel 65, thus disengaging the coupling parts that is flange 63 and the ring 64, and turning the hand wheel 65 until the desired reading is indicated on the outer scale on the ring 64 by the arrow on the flange 63, Fig. 9. Releasing the hand wheel reengages the clutch. The two settings made by the hand wheel 65 are independent and do not interfere with one another.

In connection with Fig. 4 it is pointed out that the cam 38 and roller 36 are in continuous rotation during the operation of the machine around the shaft 85. This shaft 85 makes one revolution for each pair of grippers so that upon the approach of a pair of grippers the roller 36 will contact arm 35 to move the segment 29 toward the left. At approximately the same time the cam 38 will contact the roller 51 to lift the brush 42 through arms 44, 45, 46 and 47, shaft 48, and arms 49 and 50, to thereby lift the brush to permit passage of the grippers. Immediately after the passage of the grippers the roller is released and falls on the tobacco leaves to hold them down on the segment 29 during their passage thereover.

I claim as my invention:

1. In a tobacco stemming machine, a knife driving mechanism; and means for placing the leaves under tension and adapted to cause actuation of said mechanism to transversely weaken the stems of the leaves when such tension is relieved.

2. A tobacco stem cutting and creasing machine comprising a knife driving mechanism; and means for placing the leaves under tension including a device adapted to cause actuation of said mechanism to transversely weaken the stems of the leaves when such tension is relieved.

3. A tobacco stem cutting and creasing machine comprising a knife driving mechanism; means for pulling the leaves through the machine; and a device for placing the leaves under tension with said means and adapted to set the knife driving mechanism in motion to transversely weaken the stems of the leaves when the device is uninfluenced by the pull on the leaves.

4. A tobacco stem cutting and creasing machine comprising a knife driving mechanism; a control device for the knife driving mechanism; and means for pulling the tobacco leaves through the machine in cooperation with the control device, the tension in the pulled leaves acting on the control device to prevent actuation of the knife driving mechanism and said device setting the mechanism in operation when the tension of the leaves is removed to thereby transversely weaken the stems where desired.

5. In a tobacco stemming machine, a knife; a driving mechanism for the knife which normally maintains the knife in a stationary or non-cutting position: and a device controlled by the tension of the tobacco leaves for setting the driving mechanism for the knife in operation when the leaves pass beyond the device.

6. In a tobacco stemming machine, a knife; a driving mechanism for the knife which normally maintains the knife in a stationary or non-cutting position; and a control device for the mechanism which is maintained in an arrested position by the tension of the tobacco leaves and which is adapted to set the knife in motion by the driving mechanism when the leaves pass beyond the control device.

7. In a tobacco stemming machine, a knife for transversely weakening the stems of tobacco leaves; a driving mechanism for intermittently operating the knife; a device cooperating with the tobacco leaves and adapted to set the driving mechanism in operation when the leaves pass beyond the device; and means for pressing the leaves against the device while they are passing said device.

8. In a tobacco stemming machine, a knife for transversely weakening the stems of tobacco leaves; a driving mechanism for inter-

mittently operating the knife; a device cooperating with the passing tobacco leaves and adapted to set the driving mechanism in operation when the leaves pass beyond the device; and a rotatably-mounted member which is adapted to press the leaves against the device during their passage to insure contact of the leaves with the device.

9. In a tobacco stemming machine, a knife for transversely weakening the stems of tobacco leaves; a driving mechanism for intermittently operating the knife; a movable member cooperating with the tobacco leaves and adapted to set the driving mechanism in operation when the leaves pass beyond said member; and means for pressing the leaves against said member during their passage to increase the contact of the leaves thereon.

10. In a tobacco stemming machine, a knife for transversely weakening the stems of tobacco leaves; a driving mechanism for the knife for intermittently operating the knife; an oscillating member cooperating with the tobacco leaves and adapted to set the driving mechanism in operation when the leaves pass beyond said member; means for pressing the leaves against said member during their passage to increase the contact of the leaves thereon; and means for adjusting the knife and the driving mechanism to adjust the distance of the crease or cut in the stem from the tip end of the leaf.

11. A machine for transversely weakening the stems of tobacco leaves comprising a plurality of cooperating grippers for gripping the butt ends of the leaves to be pulled through the machine; a knife for transversely weakening the stems; a knife driving mechanism for intermittently driving the knife; a device adapted to cooperate with the leaves to set the driving mechanism in operation when the leaves pass beyond the device; and means for pressing the leaves against the device to increase the contact of the leaves therewith.

12. A machine for transversely weakening the stems of tobacco leaves comprising a plurality of cooperating grippers for gripping the butt ends of the leaves to be pulled through the machine; a knife for transversely weakening the stems; a knife driving mechanism for intermittently driving the knife; a device adapted to cooperate with the leaves to set the driving mechanism in operation when the leaves pass beyond the device; means for pressing the leaves against the device to increase the contact of the leaves therewith; and means for raising the last-named means to permit the passage of the grippers.

13. A machine for transversely weakening the stems of tobacco leaves comprising a plurality of cooperating grippers for gripping the butt ends of the leaves to be pulled through the machine; a knife for transversely weakening the stems; a knife driving mechanism for intermittently driving the knife; a pivotally-mounted segment adapted to cooperate with the leaves to set the driving mechanism in operation when the leaves pass beyond the segment to thereby permit the knife to transversely weaken the stem of the leaf, said segment being normally held out of range of the grippers; means for pressing the leaves against the device to increase the contact of the leaves therewith; and means for raising the last-named means to permit the passage of the grippers and to place the segment within range of the leaves immediately after the passage of the grippers.

14. A machine for transversely weakening the stems of tobacco leaves comprising a plurality of cooperating grippers for gripping the butt ends of the leaves to be pulled through the machine; a knife for transversely weakening the stems; a knife driving mechanism for intermittently driving the knife; an oscillating member adapted to cooperate with the leaves to set the driving mechanism in operation when the leaves pass beyond the said member to thereby permit the knife to transversely weaken the stem of the leaf, said member being normally held out of range of the grippers; a brush for pressing the leaves against the device to increase the contact of the leaves therewith; and means for raising the brush to permit the passage of the grippers and to place the member within range of the leaves immediately after the passage of the grippers.

15. A machine for transversely weakening the stems of tobacco leaves comprising a plurality of cooperating grippers for gripping the butt ends of the leaves to be pulled through the machine; a knife for transversely weakening the stems; a knife driving mechanism for intermittently driving the knife; a pivotally-mounted segment adapted to cooperate with the leaves to set the driving mechanism in operation when the leaves pass beyond the segment to thereby permit the knife to transversely weaken the stem of the leaf, said segment being normally held out of range of the grippers; a brush for pressing the leaves against the device to increase the contact of the leaves therewith; and means for raising the brush to permit the passage of the grippers and to place the segment within range of the leaves immediately after the passage of the grippers, said segment being held in contact with the leaves due to the tension thereof and the backward swing immediately after passage of the ends of the leaves actuating the knife driving mechanism.

16. A machine for transversely weakening the stems of tobacco leaves comprising a plurality of cooperating grippers for gripping the butt ends of the leaves to be pulled through the machine; a knife for transversely weakening the stems; a knife driving mechanism for intermittently driving the knife;

a pivotally-mounted segment adapted to cooperate with the leaves to set the driving mechanism in operation when the leaves pass beyond the segment to thereby permit the knife to transversely weaken the stem of the leaf; a spring for normally holding the segment out of range of the grippers; a brush for pressing the leaves against the segment to increase the contact of the leaves therewith; and means for raising the brush to permit the passage of the grippers and to place the segment within range of the leaves immediately after the passage of the grippers.

17. A machine for transversely weakening the stems of tobacco leaves comprising a plurality of coopearting grippers for gripping the butt ends of the leaves to be pulled through the machine; a knife for transversely weakening the stems; a knife driving mechanism for intermittently driving the knife; a pivotally-mounted segment adapted to cooperate with the leaves to set the driving mechanism in operation when the leaves pass beyond the segment to thereby permit the knife to transversely weaken the stem of the leaf; a spring for normally holding the segment out of range of the grippers; a brush for pressing the leaves against the segment to increase the contact of the leaves therewith; means for raising the brush to permit the passage of the grippers and to place the segment within range of the leaves immediately after the passage of the grippers; and means for adjusting the knife and the driving mechanism to adjust the distance of the weakened portion in the stem from the tip end of the leaf.

18. A machine for creasing and cutting the stems of tobacco leaves comprising a plurality of cooperating grippers for gripping the butt ends of the leaves to be pulled through the machine; a knife for creasing or cutting the stems; a knife driving mechanism for intermittently driving the knife; a pivotally-mounted segment adapted to cooperate with the leaves to set the driving mechanism in operation when the leaves pass beyond the segment to thereby permit the knife to transversely weaken the stem of the leaf; a spring for normally holding the segment out of range of the grippers; a brush for pressing the leaves on the segment to increase the contact of the leaves thereon; means for raising the brush to permit the passage of the grippers and to place the segment within range of the leaves immediately after the passage of the grippers; and means for separately adjusting the knife and the driving mechanism to adjust the distance of the weakened portion in the stem from the tip end of the leaf.

19. In a tobacco stemming machine, means for weakening the stems of the leaves; and means for placing the leaves under tension including a device adapted to set said first-named means in operation to weaken the stems of the leaves when the tension of the leaves is relieved.

20. A machine for weakening the stems of tobacco leaves, comprising a stem weakening device, and means for placing the leaves under a pull force and to set said device in operation when the pull force is relieved to weaken the stems of the leaves.

In testimony whereof, I affix my signature.

CLAIBORNE W. GOOCH, JR.