

June 3, 1952

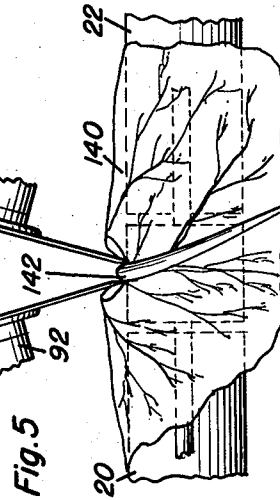
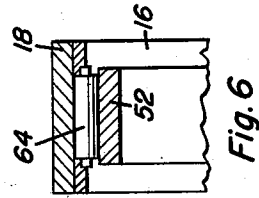
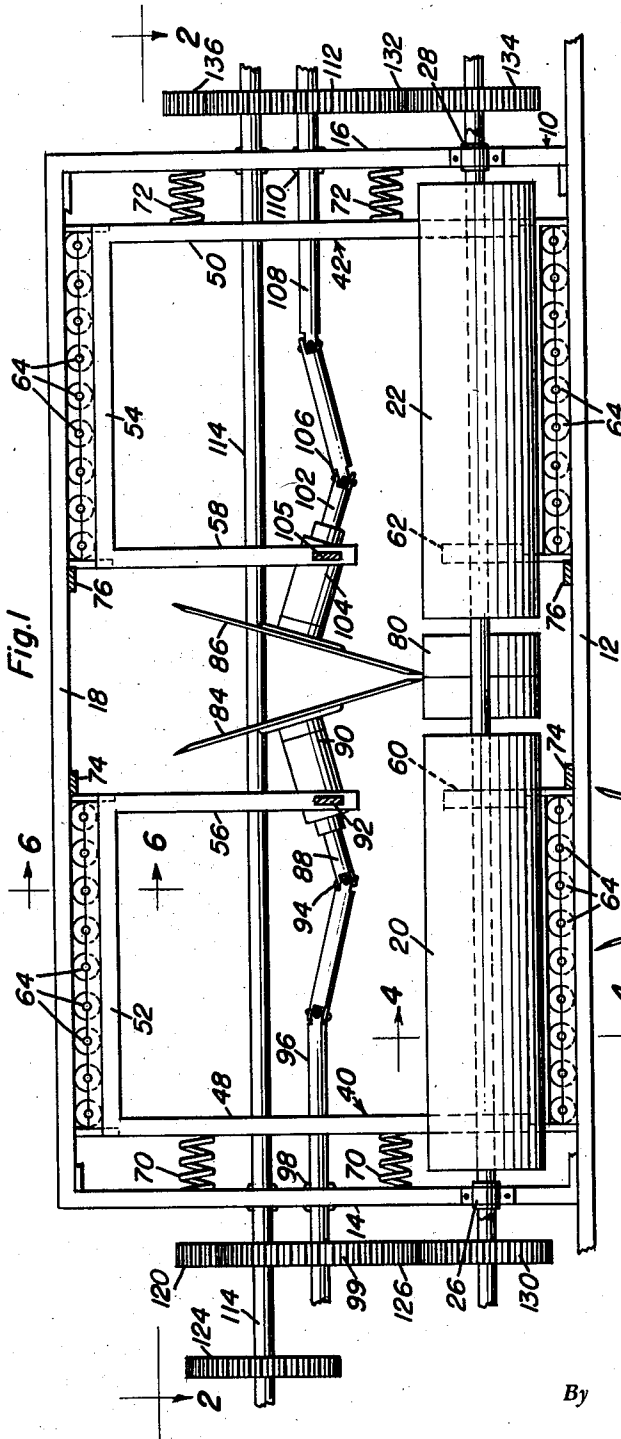
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2,599,267

STEM REMOVER FOR TOBACCO LEAVES

Filed Nov. 14, 1950

2 SHEETS—SHEET 1



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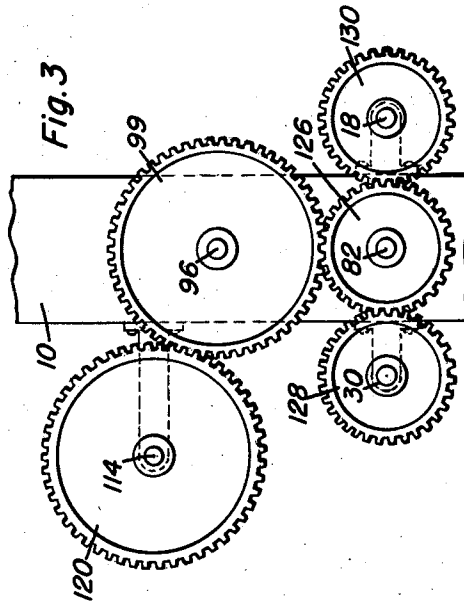
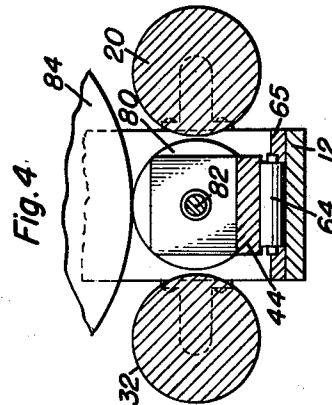
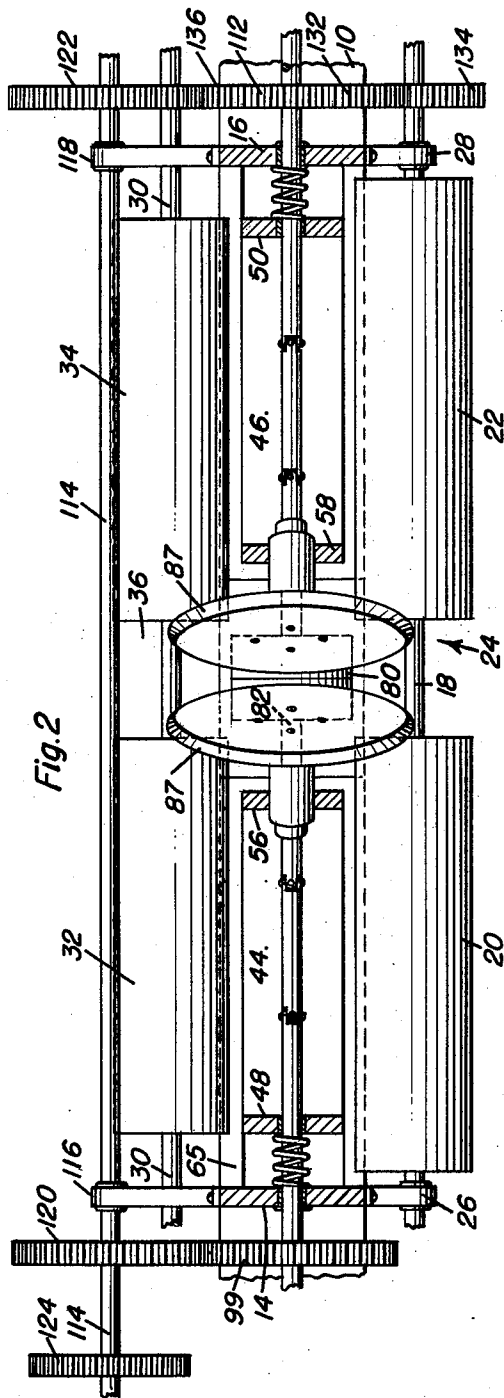
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STEM REMOVER FOR TOBACCO LEAVES

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2 SHEETS—SHEET 2



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UNITED STATES PATENT OFFICE

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STEM REMOVER FOR TOBACCO LEAVES

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4 Claims. (Cl. 131—131)

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This invention relates to the de-stemming of plant leaves and more particularly to a machine for removing the stem from tobacco leaves, and especially that known as "dark fired" tobacco leaf which has been difficult to de-stem heretofore without injuring the leaves and producing much leaf waste.

The leaves of "dark fired" tobacco contain large, heavy stems having a thickness up to one-half of an inch or larger and the leaf is very gummy. Because of the variations in the thickness of the stem and gumminess, the removal of the stem by conventional type de-stemming machines has not been accomplished successfully. Thus the removal of the stems in this kind of tobacco leaf has been effected principally by hand labor. Such hand stemming methods are not only costly but result in a great deal of waste.

It is accordingly, a principal object of the present invention to provide a machine for performing this stemming operation on "dark fired" tobacco leaf which is efficient in operation and produces a minimum of waste material.

A further object of this invention envisions the provision of a machine for de-stemming gummy leaves of this character which efficaciously removes the stems without injuring the leaf, and such as commonly results by hand stemming methods.

Still another object is the provision of a machine having rotating cutting blades and associated roller mechanism which is operable to perform the de-stemming operation without gumming up or otherwise interfering with the ease of operating the machine.

These and other objects and advantages will become apparent as the description proceeds. Although the novel features which are believed to be characteristic of this invention will be more particularly pointed out in the claims appended hereto, the invention itself, as to its other objects and advantages and manner of operation may be better understood by referring to the following description taken in connection with the accompanying drawings forming a part thereof, in which:

Figure 1 is an elevational view of one form of machine for practicing the invention and wherein the outer ends of the machine is shown broken away to indicate the use of multiple machines of similar construction interconnected and operated for de-stemming tobacco leaves;

Figure 2 is a plan view of the machine illustrated in Figure 1 and taken substantially on the line 2—2 of said figure;

Figure 3 is a detail view illustrating the gear train arrangement for operating the circular cutting knives and associated roller mechanism;

Figure 4 is a fragmentary sectional detail view taken substantially on the plane indicated by the lines 4—4 of Figure 1 and looking in the direction of the arrows;

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Figure 5 is a fragmentary detail view illustrating a tobacco leaf in position between the knives for performing the de-stemming operation; and

5 Figure 6 is a fragmentary detail taken on the line 6—6 of Figure 1 and looking in the direction of the arrows.

Referring to the drawings in detail, wherein like reference characters indicate similar parts throughout the several views, and particularly Figures 1 and 2, the numeral 10 indicates a rectangular frame comprising a base portion 12 having side walls 14 and 16 and a connecting top frame member 18. Suitably mounted on the front of the upstanding frame members 14 and 16 is a roller shaft 18 upon which is fixed rolls 20 and 22, the rolls being spaced on the shaft 18 to provide a central opening 24. The shaft 18 carrying the rollers 20 and 22 is journaled in the brackets 26 and 28 attached at the front of the frame members 14 and 16 and adjacent the outer ends of the rolls.

Mounted on the rear side of the upstanding frame members 14 and 16 and laterally spaced from the roller shaft 18 is a second roller shaft 30 similarly journaled in brackets, not shown, attached to the members 14 and 16, upon which is fixedly mounted rolls 32 and 34, the rolls being spaced on the shaft to provide a central opening 36 which corresponds to the spacing of rolls 20 and 22 on shaft 18. The rolls 32 and 34 are preferably of substantially the same diameter as the rolls 20 and 22 but of somewhat less length, as illustrated in Figure 2.

35 Arranged centrally and extending parallel with said rolls is a pair of opposed C-shaped carriages generally designated 40 and 42. The carriages comprise laterally extending base members 44 and 46 with end walls 48 and 50, and laterally extending top members 52 and 54. Integral depending arms 56 and 58 are provided on the inner ends of the top members 52 and 54 respectively. Diametrically opposed to the depending arms 56 and 58 are upstanding end sections 60 and 62 which are formed on the base members 44 and 46 respectively.

Each of the C-shaped carriages 40 and 42 are mounted for lateral movement within the rectangular frame 10 by means of the multiple sets of rollers generally indicated at 64 and suitably retained in the roller guide raceways 65 arranged above and beneath the carriage frames, as illustrated in Figure 1. A pair of compression springs 70 and 72 is spacedly disposed between the members 48 and 50 and side walls 14 and 16, respectively, to continuously urge the carriages towards each other and against the stop means 74 and 76 positioned on the top and bottom of the frame members 18 and 12.

60 Arranged centrally between the opposed carriages 40 and 42 is a small roll 80 which is preferably of the same diameter as rolls 20 and 22 and

of a length approximating the size of the opening between the rolls as at 24. The roll 80 is fixed on shaft 82 which extends through and forms a lower guide for the carriages 40 and 42, the shaft passing through suitable apertures in the carriage end wall member 48, 60, 62 and 50, and being journaled in the frame members 14 and 16, similarly as roller shafts 18 and 30.

The cutting part of the machine consists of two circular knives 84 and 86 which are supported and driven as illustrated in Figures 1 and 2. The circular knives or cutting discs preferably comprise beveled or sharpened edge surfaces 87, but if desired may comprise thin saw-toothed surfaces, or the like. The circular knife 84 is fixed on the end of the shaft 88 which is suitably journaled as at 90 which, in turn, is pivotally supported near the lower end of the depending arm 56 by the pin 92. Shaft 88 is connected through universal joints 94 to the shaft 96 which is journaled, as at 98 in the side frame member 14. A gear 99 keyed to the shaft 96 is arranged to be driven to operate the cutting knife. Similarly the opposed circular knife 86 is fixed on the shaft 102 which is journaled as at 104 and pivotally attached by means of a pin 105 to the lower end of the arm 58. The shaft 102 is likewise connected through the universal joints 106 to the shaft 108, which is journaled in the side frame member 16, as at 110. A gear 112 keyed to the shaft 108 is arranged to drive the circular knife 86. By thus mounting the cutting knives and driving them individually through universal shaft connections which are pivotally supported on the depending arms of the opposed carriages, the knives are permitted to pivot about a vertical plane so as to increase or decrease the space between the opposed knives to accommodate varying widths or sizes of stems. Lateral swinging of the knives about their respective journaled supports is prevented by the transverse pin members 92 and 105.

To drive the rolls and circular knives individually so as to provide for smooth and efficient operation of the machine, gear trains are arranged at opposite ends of the frame 10. A driven shaft 114 extends longitudinally of the frame 10 and is suitably journaled in brackets 116 and 118 attached at opposite ends of the frame 10, on which is keyed the gears 120 and 122. Power is transmitted to the shaft 114 through the gear 124 which is fixed thereon and is driven by a suitable prime mover, not shown, such as a motor. Gear 120 is in mesh with gear 99 which drives the shaft 96 and attached circular knife 84. Gear 99 in turn is in mesh with gear 126 which operates the bottom roll 80, beneath the knives 84 and 86, and the gear 126 in turn is in mesh and drives gears 128 and 130 attached to the shafts 30 and 18 respectively.

On the opposite side of the frame 10, the gear 122 is in mesh with and drives gear 112 which is keyed to the shaft 108 and thus the circular knife 86 is positively driven similarly as the knife 84 and at the same rotational speed. Gear 112, like gear 99 is arranged to drive corresponding gears 132, 134 and 136 on the shafts 82, 18 and 30 respectively.

In operating the machine to remove the stem from a tobacco leaf, a leaf 140, as illustrated in Figure 5 is guided over the rolls 20 and 22 and 80 beneath the circular knives 84 and 86 as shown, the large end of the stem being fed over the rolls and into the cutters. The knives

are engaged at opposite sides of the stem, as shown at 142, and the leaf advanced between the knives while the rolls and knives are rotating. The circular cutting blades automatically adjust themselves as the leaf is advanced therebeneath so that the stem is cleanly cut away from the leaf. Movement of the rotating knives laterally while rotatively supported on their respective carriages is effected in accordance with the variance in the width of the stem. Thus the width of the stem controls the separation distance between the rotating knives.

The circular knives for cutting the leaf free of the stem are preferably made of metal, such as spring steel, being driven at a speed suitable for the particular material being de-stemmed, and the skill of the operator. The rolls are of the conventional type, and may be made up of laminated or unlaminated layers as desired.

By providing suitably tensioned springs 70 and 72 so as to apply just enough lateral pressure against the opposed flexible mounted circular knives 84 and 86, the cutting members may be made to hug and follow the stem accurately even though its width and discourse along the leaf may vary considerably. Further due to the spacing of the rolls and their driving arrangement with the circular knives, leaves which heretofore have been too gummy to successfully de-stem by existing stripping machines are efficiently accomplished by the present machine.

While certain novel features of the invention have been disclosed and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in this art without departing from the spirit and scope of the invention.

What is claimed is:

1. In a tobacco stemming machine, the combination with a pair of circular knives having adjacent cutting edges arranged to receive the stem of a tobacco leaf between them, means comprising a frame, a plurality of roll shafts carried by said frame, rolls on said shafts, means comprising laterally shiftable carriages positioned in said frame, each of said carriages being operatively connected to a knife, and means for operating said knives individually to de-stem said tobacco leaf.

2. The combination of claim 1 wherein said carriages are mounted on rollers and yieldably urged towards each other.

3. The combination of claim 1 wherein said knives are mounted on a shaft having universal joints.

4. The combination of claim 1 wherein a gear train is arranged at opposite ends of said frame for driving said shafts.

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