April 23, 1957 H. LEWIN 2,789,704

TOBACCO LEAF STACKER

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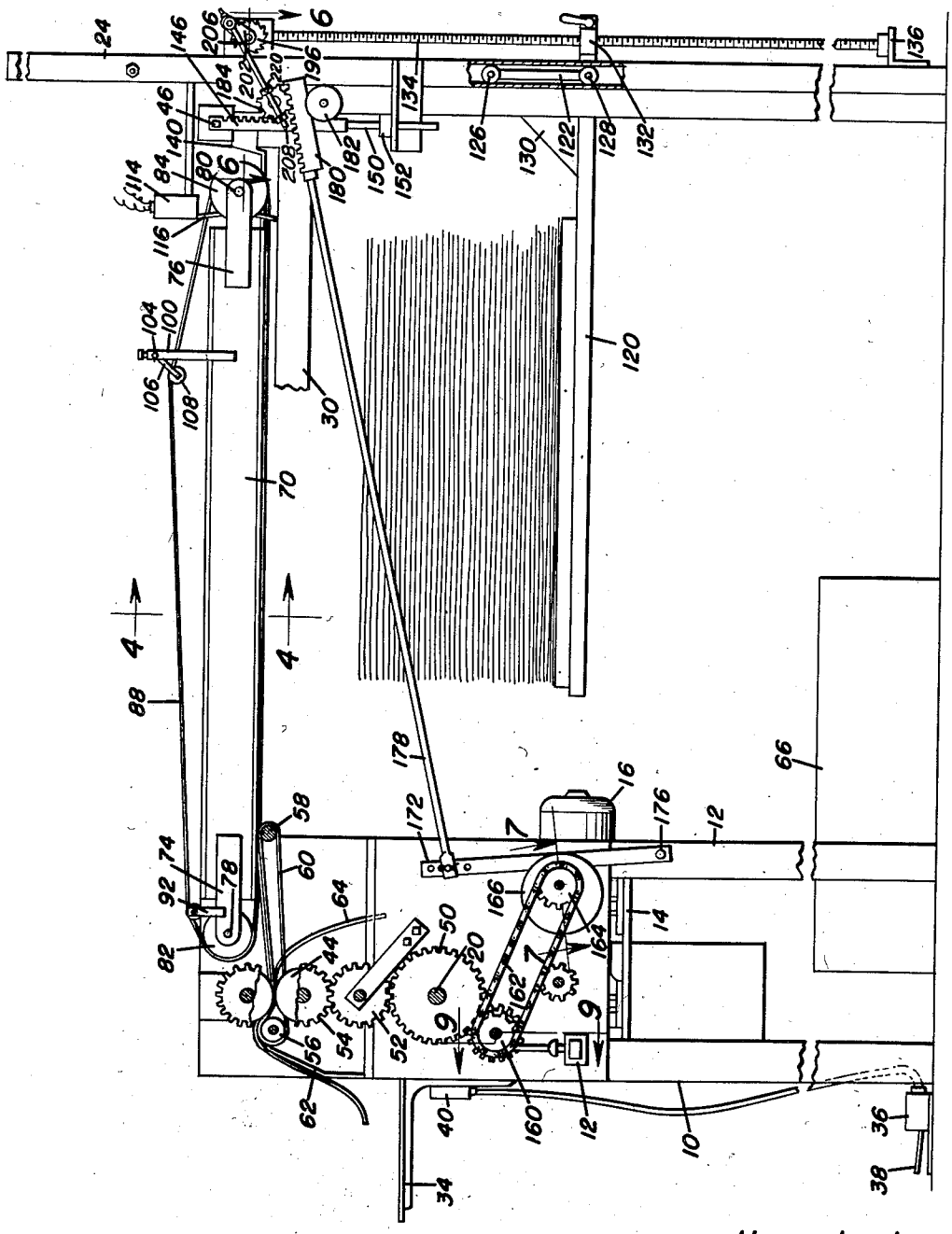


Fig. 1

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Fig. 3

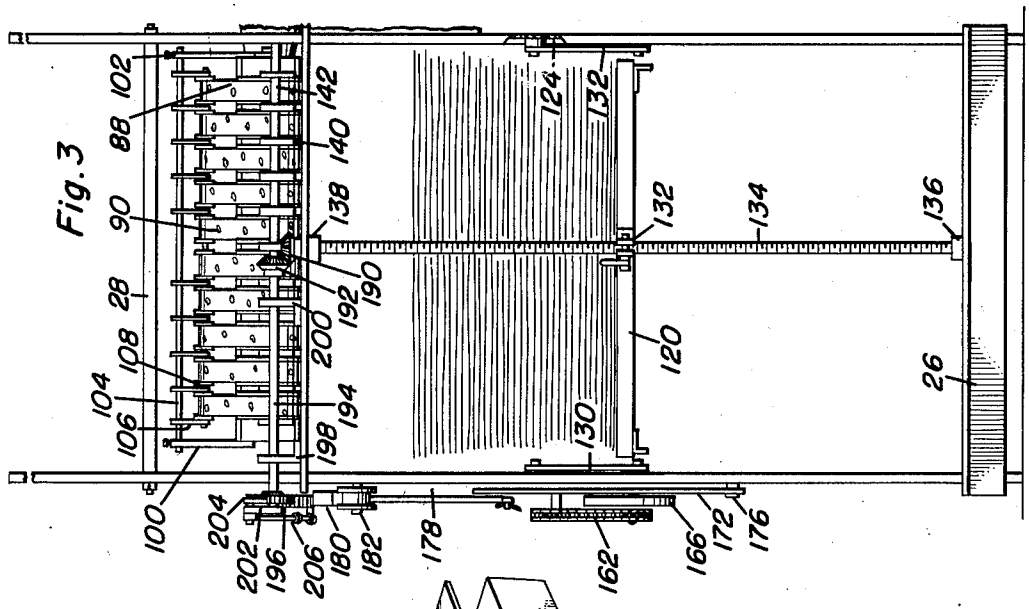
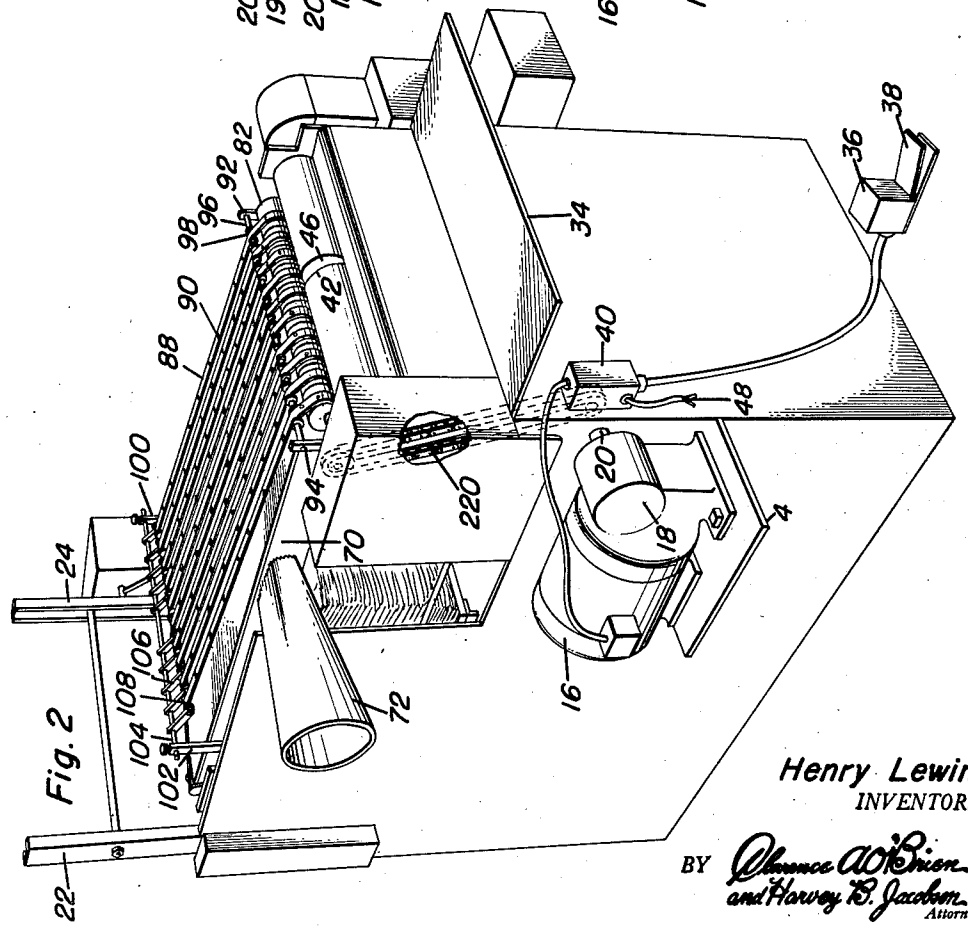


Fig. 2



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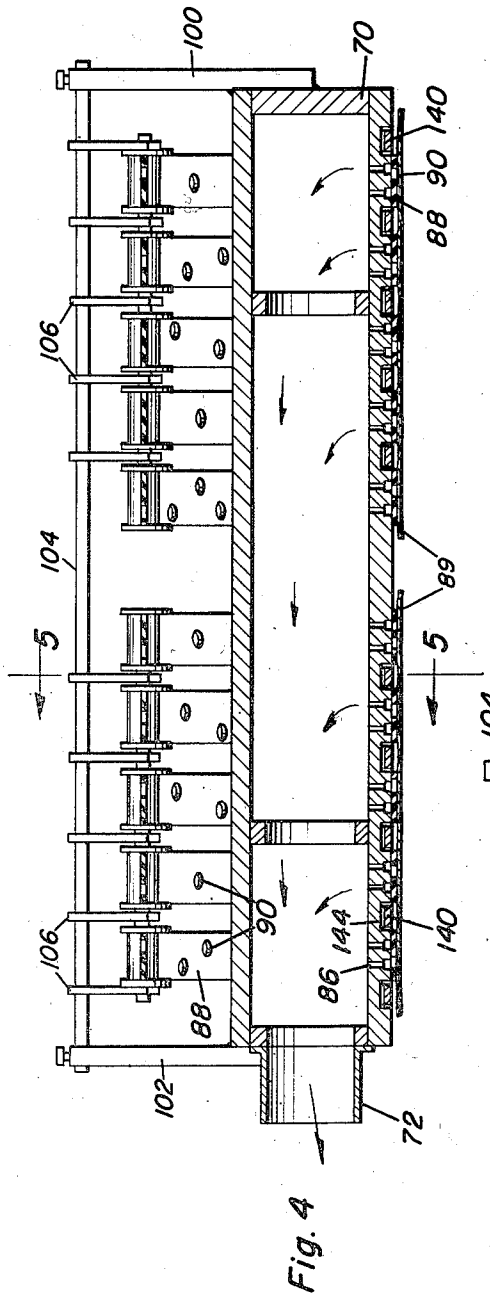


Fig. 4

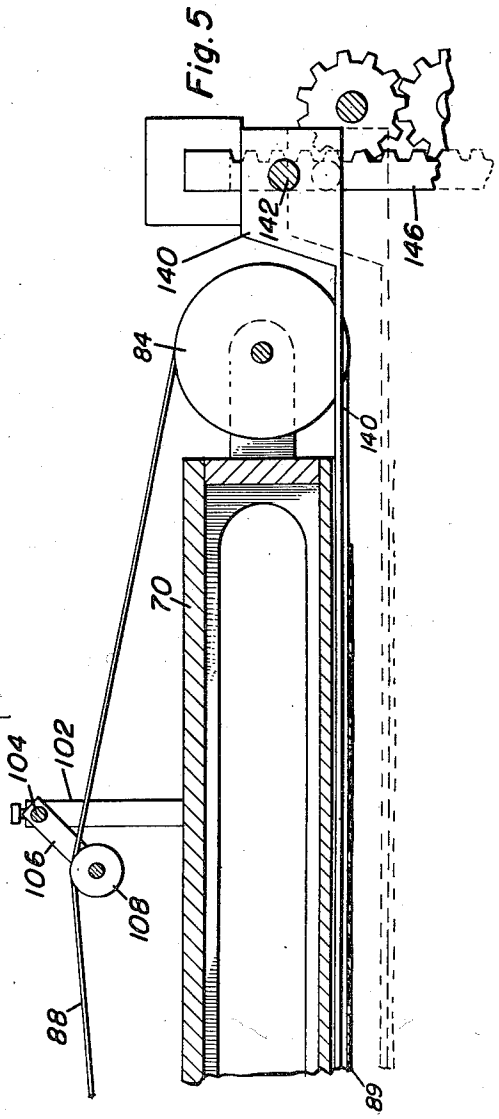


Fig. 5

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TOBACCO LEAF STACKER

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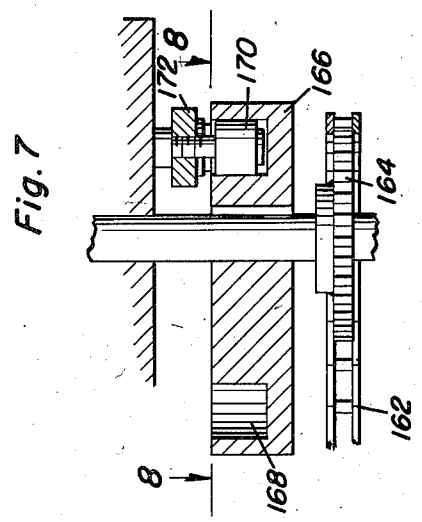


Fig. 7

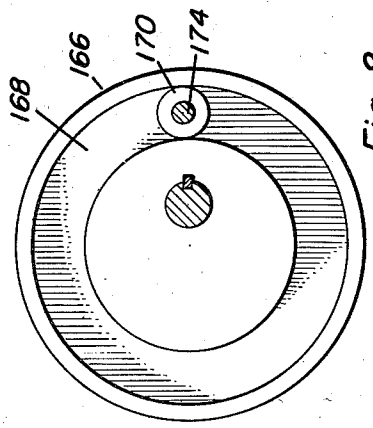


Fig. 8

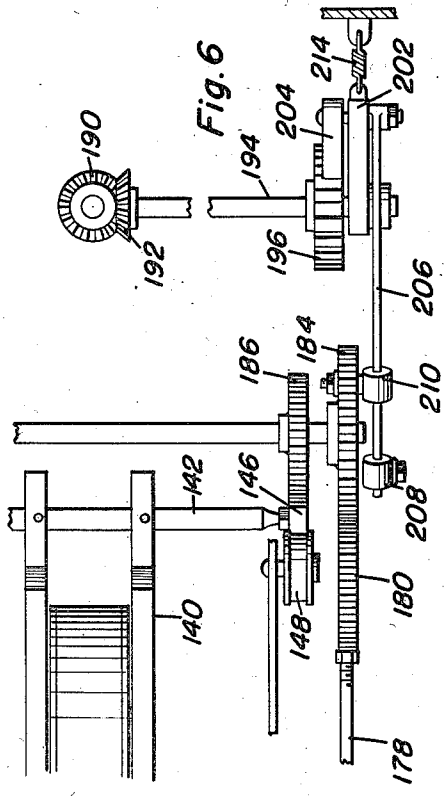


Fig. 6

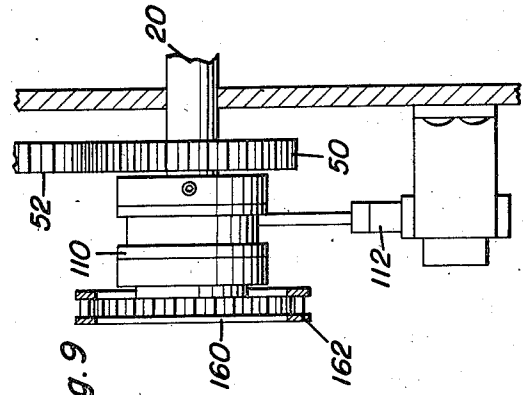


Fig. 9

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2,789,704

TOBACCO LEAF STACKER

Henry Lewin, Clarksville, Tenn.

Application October 5, 1953, Serial No. 384,141

3 Claims. (Cl. 214—6)

This invention relates to a stem remover for tobacco leaf and particularly to a device for removing the main stem from tobacco leaves and stacking the destemmed leaves into a neat pile.

In the utilization of tobacco leaves it is usually necessary to remove the main stem and to stack the destemmed leaves in neat piles so that they may be conveniently utilized for various purposes.

The present invention provides a machine for cutting out the main stem of a tobacco leaf and carrying the leaves and stacking them into neat piles so that they may be further utilized. This is accomplished by means of roller cutters to which the leaves are fed by a conveyor, the leaves being placed on the conveyor by manual operation, and the conveyor transferring the destemmed leaves to a second conveyor while the cut away stem is allowed to fall into a receiving bin. The second conveyor is of the vacuum type in which the leaves are held to conveyor belts by means of suction through a plurality of apertures on the belt until the leaves contact a feeler which energize a solenoid which cause the operation of stripper fingers to remove the leaves from the suction conveyor to a pallet and means for lowering the pallet as the leaves are applied thereto.

It is accordingly an object of the invention to provide an improved tobacco trimming machine.

It is a further object of the invention to provide an improved vacuum conveyor.

It is a further object of the invention to provide a device for conveniently stacking tobacco leaves.

Other objects and many of the attendant advantages of the present invention will be apparent from the following detailed description taken in conjunction with the accompanying drawing, in which:

Figure 1 is a side elevation of the tobacco trimming machine with parts broken away in section;

Figure 2 is a perspective view of the tobacco trimming machine with a portion of the chain guard broken away;

Figure 3 is a rear elevation of the machine;

Figure 4 is an enlarged cross-section through the vacuum conveyor taken substantially on the plane indicated by the section line 4—4 of Figure 1;

Figure 5 is an enlarged longitudinal section through the suction conveyor taken substantially on the plane indicated by the section line 5—5 of Figure 4;

Figure 6 is an enlarged plan view of the stacker drive;

Figure 7 is an enlarged sectional view of the stacker drive cam taken substantially on the plane indicated by the section line 7—7 of Figure 1;

Figure 8 is an elevation of the cam taken substantially on the plane indicated by the section line 8—8 of Figure 7; and,

Figure 9 is an enlarged elevation of the solenoid control press taken substantially on the plane indicated by the section line 9—9 of Figure 1.

In the exemplary embodiment according to the invention a main frame is provided with a pair of front legs

10 and a pair of intermediate legs 12 on which is mounted a motor receiving platform 14 for receiving the motor 16. The motor 16 is provided with a gear head 18 which drives a main drive shaft 20. A frame is also provided with a pair of rear legs 22 and 24 which are spaced apart at the bottom by means of a frame member 26 and spaced apart at the top by means of a spacer rod 28. The rear members 22 and 24 are separated from the front legs 12 by means of side members 30.

At least the rear legs 22 and 24 are made of channel members for a purpose presently to be described while the other members may be of channel, angle or other such formation as may be desired. The frame members are preferably covered by means of suitable plate members to provide an enclosure for the machinery not only to keep the machinery in undamaged relation but to prevent damage to others by contact with the machinery. A table or shelf 34 is mounted on the front legs 10 for receiving tobacco leaves to be operated and a control switch 36 is provided with a foot lever 38 so that the operator may control the switch which operates through a control box 40 to control the motor 16. Energy is supplied to the device by means of a pair of conductors 42. A cutting roller 44 is mounted between the frame members and cooperates with a pair of knives 46 and 48 which are preferably of the type disclosed in my prior Patent No. 2,599,267, issued June 13, 1952.

The roller 44 and the cutting knives 46 and 48 are driven from the shaft 20 by means of a main gear 50 and an idler gear 52 which is in meshed relation with a gear 54 on the end of a roller 44 with the whole being mounted for motion as shown in my prior patent. An idler roller 56 is mounted in front of the cutter bars and an idler roller 58 is mounted rearwardly thereof and belt conveyors 60 are mounted thereon and extend under the drums of the knives 46 and 48 and are driven thereby. The tobacco leaf to be trimmed is spread out on the inclined surface 62 and fed onto the conveyor 60 with the stem 64 between the knives 46 and 48 so that it is separated from the main part of the leaf and the stem 64 is allowed to drop into a container 66 in the bottom part of the machine.

The motor 16 has a gear head 18 thereon and is also preferably provided with a suitable brake not shown so that when the switch is not energized the motor will suddenly stop. This allows the operator plenty of time to carefully spread the leaves so that the stem 64 will be fed through the cutters in a proper position and the motion of the cutters are completely controlled by means of the foot switch 38.

A suction conveyor for removing the cut leaves from the conveyor 60 and taking them to a stacking device comprises a vacuum chamber 70 having a connection 72 thereto for connection to a pump or other vacuum producing device. The vacuum chamber 70 is provided with a pair of forward brackets 74 and a pair of rearwardly extending brackets 76 in which is mounted a shaft 78 and 80 respectively. A plurality of sheaves 82 are mounted on the shaft 78 and a plurality of sheaves 84 are mounted on the shaft 80. The suction chamber 70 is provided with a plurality of longitudinal slots 86 and belts 88 are entrained over the sheaves 82 and 84 and cover the various slots 86. The belts 88 are provided with apertures 90 which communicate with the slots 86 so that the suction in the chamber 70 will be delivered through the belts to lift the leaves off of the conveyor 60 against the belts 88. Upwardly extending brackets 92 and 94 carry shaft 96 on which are a plurality of idler pulleys 98. Likewise a pair of upstanding shafts 100 and 102 carry a shaft 104 in which a plurality of depending brackets 106 carry idler pulleys 108. The

shaft 104 are adjustable in the standards 100 and 102 to maintain a tension on the belts 88. A clutch 110 of the type which makes one revolution everytime it is energized is controlled by means of a solenoid 112 which in turn is controlled by means of a control switch 114 having a feeler 116 depending between the belts 88 so that it will be tripped by means of a tobacco leaf 89 carried by the belts 88.

A leaf receiving pallet 120 is mounted below the conveyor belts 88 and is provided with brace members 122 and 124 having rollers 126 and 128 engaging the channel members 22 and 24 and provided with a brace member 130 and 132 so that the pallet 120 is rigidly supported in the channel members 22 and 24. A split nut 132 is attached to the pallet 120 and is in threaded engagement with the threaded rod 134 which is mounted by means of brackets 136 and 138 on the rear frame of the machine.

A plurality of stripping fingers 140 are mounted on a cross rod 142 and are interdigitated with the belts 88 and preferably lie in grooves 144 in the bottom surface of the chamber 70. The cross rod 142 is mounted on rack bar 146 which is provided with a guide roller 148 and is also provided with an extension 150 which extends through a guiding sleeve 152 mounted on the rear frame members of the machine.

A driving connection for the fingers 140 comprises the sprocket wheel 160 which is mounted on the clutch 110 for rotation therewith and which carries a sprocket chain 162 which is entrained over a sprocket gear 164 which drives a cam 166 having a cam groove 168 therein for receiving a cam roller 170 secured on a lever 172 by means of a pivot pin 174. The oscillating lever 172 is pivoted about a pin 176 mounted on one of the upright legs 12.

The oscillating lever 172 is connected to a pitman 178 which is provided at its opposite end with a rack 180 which is mounted on a guide roller 182. The rack 180 is in mesh with a drive gear 184 which is in driving relation with a rack gear 186 which meshes with the rack 146 so that rotation of the drive gear 184 will rotate the gear 186 and cause vertical reciprocation of the rack 146.

A driving connection for rod 134 comprises a bevel or crown gear 190 which meshes with a bevel gear 192 mounted on a drive shaft 194, a toothed wheel 196 being fixed on the outer end of the shaft 194, and the shaft 194 being journaled in suitable bearing blocks 198 and 200. An oscillating arm 202 is journaled on the shaft 194 adjacent to the toothed wheel 196 and carries a dog 204 for cooperation therewith. The arm 202 is oscillated by means of a pitman 206 having a stop 208 thereon to be engaged by means of a sliding dog 210 which is pivotally mounted on the drive gear 184, the arm 202 being biased to rearward relation by means of spring 214.

In the operation of the device the operator will select a leaf and apply it to the cutters 46 and 48 which will then be carried by the conveyor 60 and the motion of the device will be controlled by means of the operator having his foot on the switch lever 38. The motion of the drive shaft 20 will be transmitted to the shaft 78 by means of the drive chain 220. The operator will spread the leaf and when it is necessary will stop or start the motor to cause continuous or intermittent feed as he sees fit. The cut leaf 89 will be carried by the conveyor 60 while the stem 64 will drop away into the container 66 and the conveyor 60 will carry the cut leaf adjacent to the belts 88 and the suction in the chamber 70 will cause the leaf 89 to adhere to the belts 88 and they will be transferred along the bottom of the suction box 70 until the leaf 89 touches the feeler 116 at which time the feeler 116 will operate the switch 114 to energize the solenoid 112 to cause the one turn clutch 110 to engage which will cause the sprocket gear 160 which is a 1 to 1 ratio with the sprocket gear 164 to turn the cam 166 one complete revolution. This will cause the rocker lever 172 to move forward and back through one oscillation so that the pitman 178 will move forward so that the rack 180 will cause the drive gear 184 to turn in one direction and then in the other. This motion will cause the rack 146 to move down to carry the fingers 140 which will strip the leaf 89 from the belt conveyors 88 and deposit them on the pallet 120. The upward motion will then return the fingers 140 to interdigitated position between the belts 88. The motion of the drive gear 184 will cause the pivoted guide 210 to slide down on the pitman 206 until it hits the stop 208 which will cause the arm 202 to oscillate and move the toothed wheel 196 a partial turn so that the gears 192 and 190 will turn the rod 134 a partial turn and lower the pallet substantially the thickness of the leaf of tobacco.

When the pallet 120 has received a sufficient load of tobacco it may be removed therefrom and the split nut 132 may be released to quickly relieve the connection with the rod 134 so that the pallet may be again adjusted in proximity to the belts 88 for again receiving a new load of tobacco.

It will thus be apparent that the present invention has provided a destemming and stacking device for removing the stems from tobacco leaves and stacking the tobacco leaves for further use.

For purposes of exemplification a particular embodiment of the invention has been shown and described according to the best present understanding thereof. However, it will be apparent to those skilled in the art that many changes and modifications in the construction and arrangement of the parts thereof may be made without departing from the true spirit and scope of the invention.

What is claimed as new is as follows:

1. A stem removing machine comprising a feeding conveyor for supporting a leaf, a vacuum conveyor overlying said feeding conveyor for receiving the stemmed leaves therefrom, said vacuum conveyor including a suction chamber having longitudinal slots therein, a plurality of belts entrained over said suction chamber and covering said slots, said belts having apertures therein, a one revolution clutch, a solenoid operatively associated with said clutch, a feeler mounted in the path of travel of a leaf on said vacuum conveyor, a switch actuated by contact of said feeler with a leaf, said switch energizing said solenoid to engage said clutch, a vertically disposed rack bar mounted adjacent to said vacuum conveyor, a plurality of stripper fingers mounted on said rack bar, said stripper fingers being interdigitated with said belts, a rack gear meshed with said rack bar, a drive gear operatively associated with said rack gear, a cam driven through said clutch, a pitman actuated by said cam, a rack on said pitman and in engagement with said drive gear whereby rotation of said drive gear will cause vertical reciprocation of said rack, a pallet mounted for vertical sliding movement under said vacuum conveyor, a vertically disposed threaded rod, a nut engaging said rod and supporting said pallet, and means for rotating said rod a predetermined amount with each operation of said pitman to lower said pallet substantially the thickness of a tobacco leaf for each reciprocation of said rack.

2. A stem removing machine comprising a feeding conveyor for supporting a leaf, a vacuum conveyor overlying said feeding conveyor for receiving the stemmed leaves therefrom, said vacuum conveyor including a suction chamber having longitudinal slots therein, a plurality of belts entrained over said suction chamber and covering said slots, said belts having apertures therein, a one revolution clutch, a solenoid operatively associated with said clutch, a feeler mounted in the path of travel of a leaf on said vacuum conveyor, a switch actuated by contact of said feeler with a leaf, said switch energizing said solenoid to engage said clutch, a vertically disposed rack

bar mounted adjacent to said vacuum conveyor, a plurality of stripper fingers mounted on said rack bar, said stripper fingers being interdigitated with said belts, a rack gear meshed with said rack bar, a drive gear operatively associated with said rack gear, a cam driven through said clutch, a pitman actuated by said cam, a rack on said pitman and in engagement with said drive gear whereby rotation of said drive gear will cause vertical reciprocation of said rack, a pallet mounted for vertical sliding movement under said vacuum conveyor, a vertically disposed threaded rod, a nut engaging said rod and supporting said pallet, gear means operatively connected to said rod, a toothed wheel operatively connected to said gear means for rotation thereby, an oscillatory arm driven by said drive gear, a dog on said arm and in engagement with said toothed wheel so that upon movement of said toothed wheel a partial turn, said gear means will turn said rod a partial turn and lower said pallet substantially the thickness of a leaf of tobacco.

3. A stem removing machine comprising a feeding conveyor for supporting a leaf, a vacuum conveyor overlying said feeding conveyor for receiving stemmed leaves therefrom, said vacuum conveyor including a suction chamber having longitudinal slots therein, a plurality of belts entrained over said suction chamber and covering said slots, said belts having apertures therein, a one revolution clutch, a solenoid operatively associated with said clutch, a feeler mounted in the path of travel of a

leaf on said vacuum conveyor, a switch actuated by contact of said feeler with a leaf, said switch energizing said solenoid to engage said clutch, a vertically disposed rack bar mounted adjacent to said vacuum conveyor, a plurality of stripper fingers mounted on said rack bar, said stripper fingers being interdigitated with said belts, a rack gear meshed with said rack bar, means driven through said clutch to rotate said gear in a forward and back motion to lower and raise said fingers to strip a leaf from said vacuum conveyor.

References Cited in the file of this patent

UNITED STATES PATENTS

500,647	Williams	July 4, 1893
788,727	Munsey	May 2, 1905
1,225,240	Grodsky	May 8, 1917
1,461,150	Jackson	July 10, 1923
1,841,531	Hinchcliff	Jan. 19, 1932
1,981,470	Rundell	Nov. 20, 1934
2,192,518	Eissmann	Mar. 5, 1940
2,195,427	Rundell	Apr. 2, 1940
2,292,727	Turbeville	Aug. 11, 1942
2,599,267	Lewin	June 3, 1952
2,665,013	Socke	Jan. 5, 1954

FOREIGN PATENTS

497,462	Germany	May 8, 1930