Nov. 6, 1951 C. J. GREEN 2,574,030

TOBACCO STRIPPER AND GRADER

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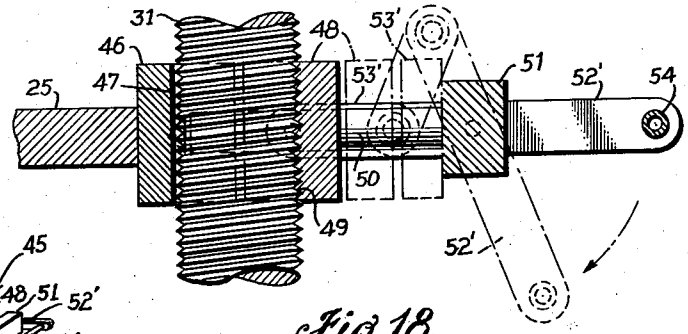


Fig. 1B.

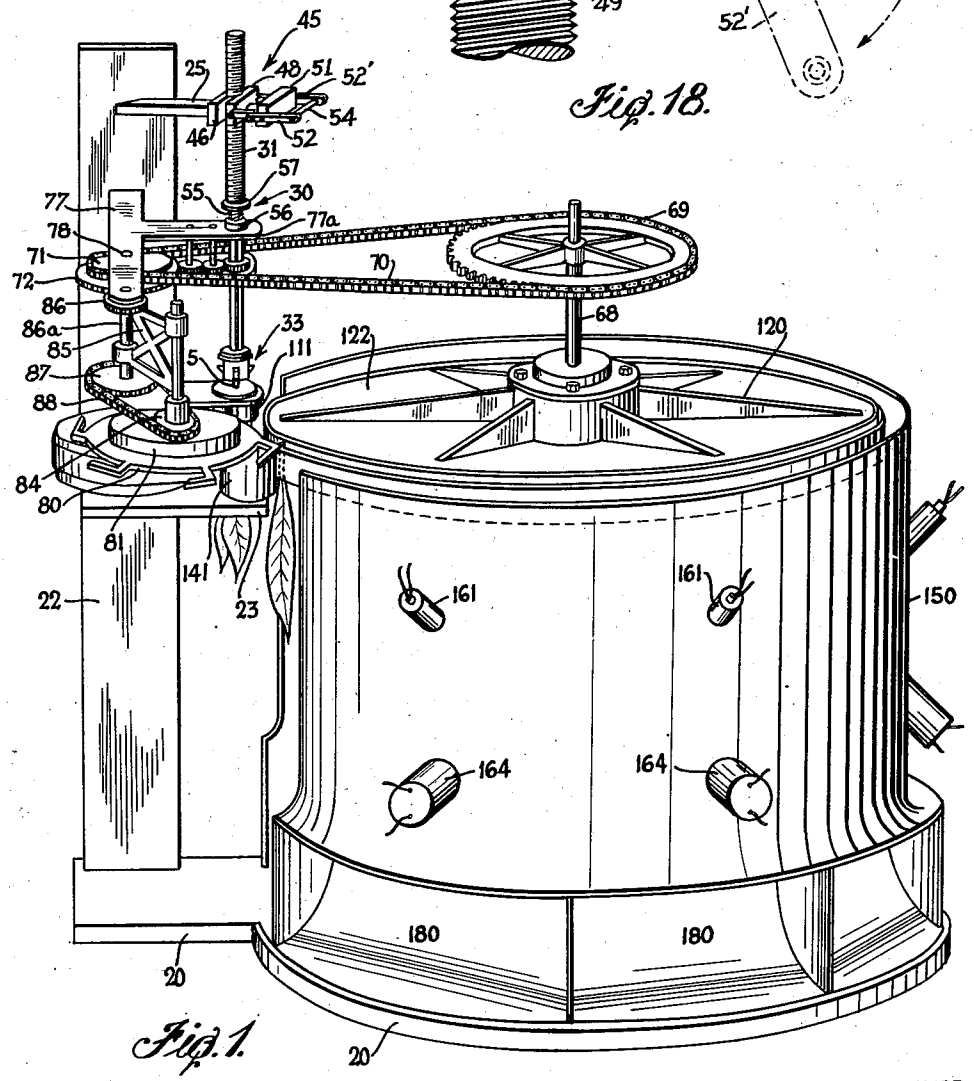


Fig. 1.

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Fig. 2.

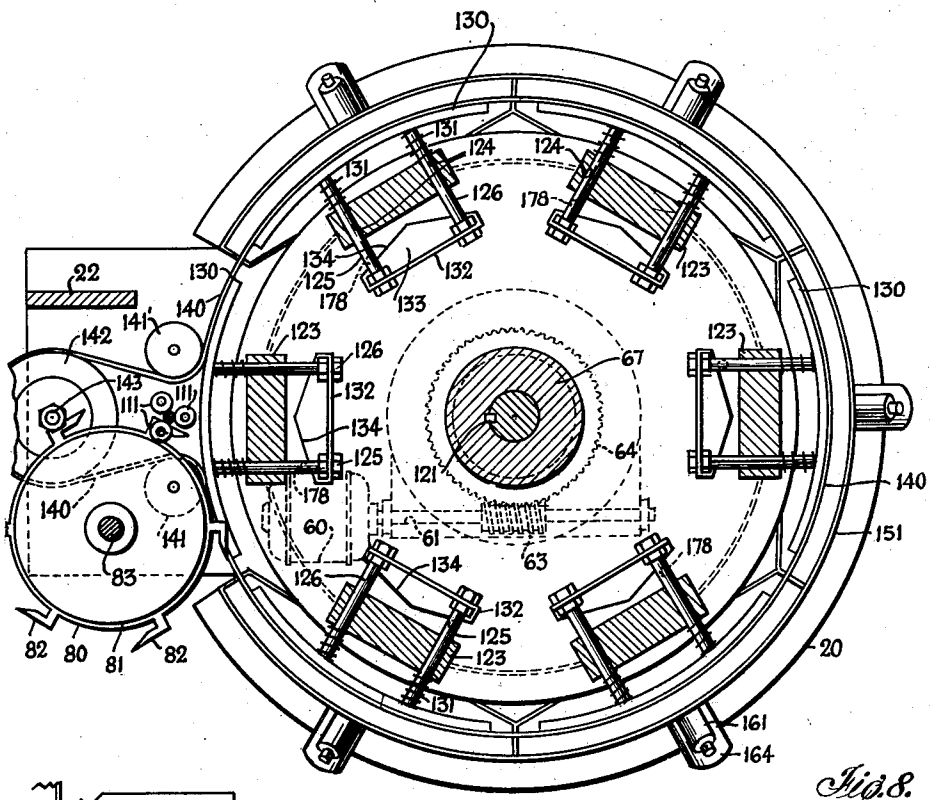
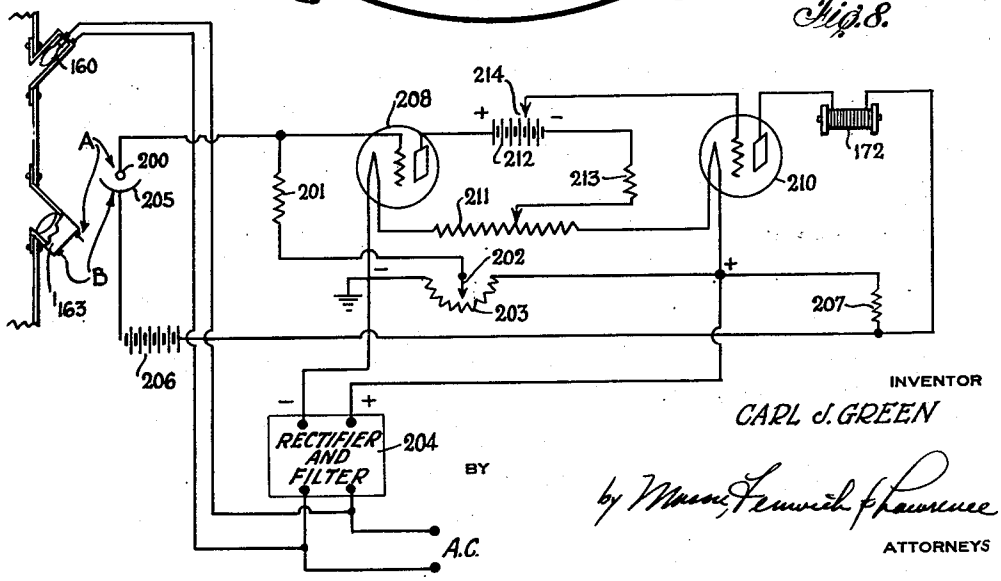


Fig. 8.



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TOBACCO STRIPPER AND GRADER

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Fig. 3.

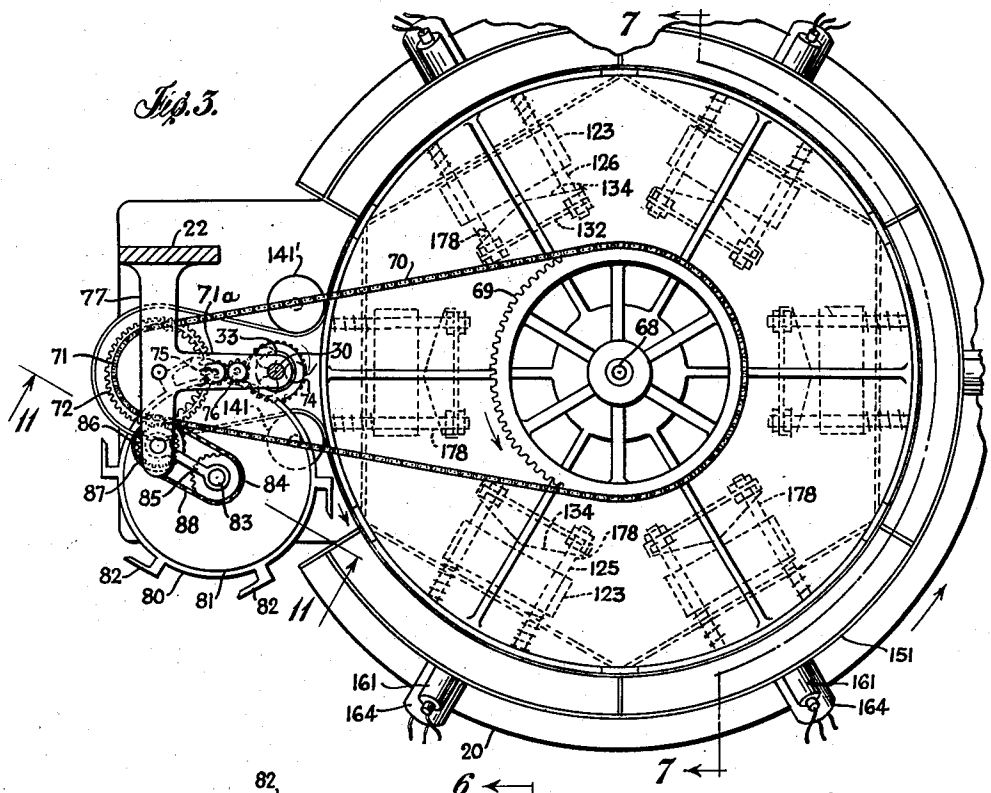
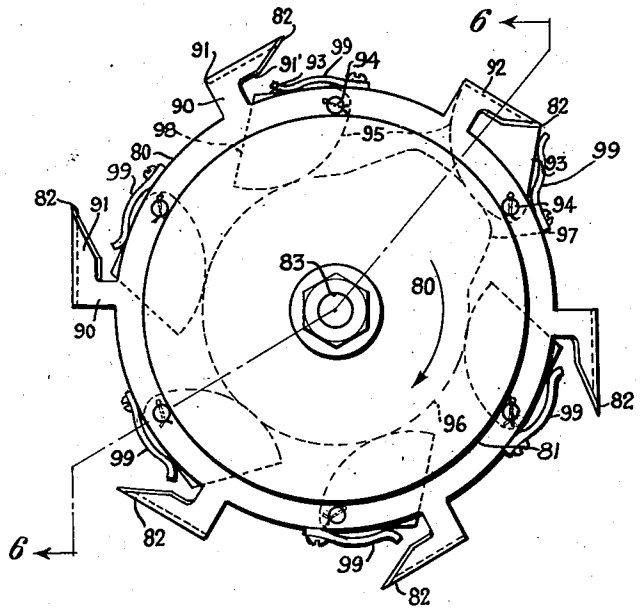


Fig. 5.



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Fig. 4.

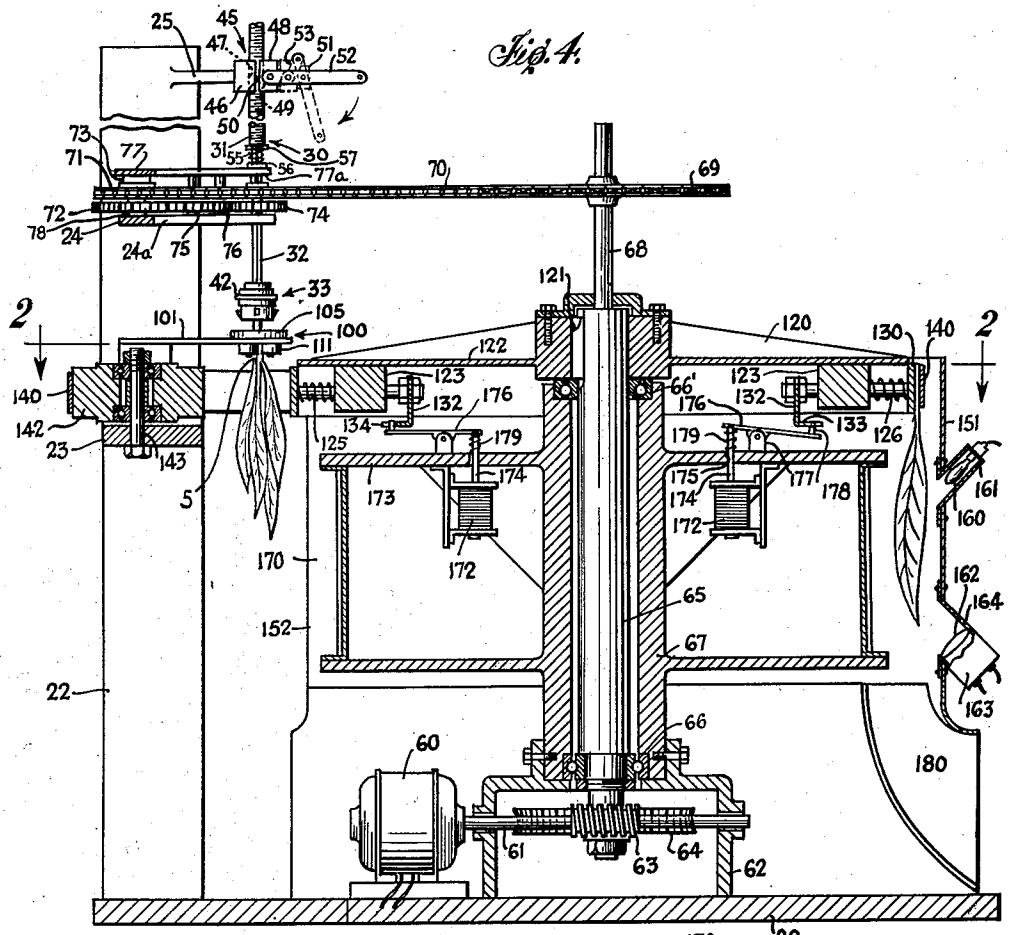
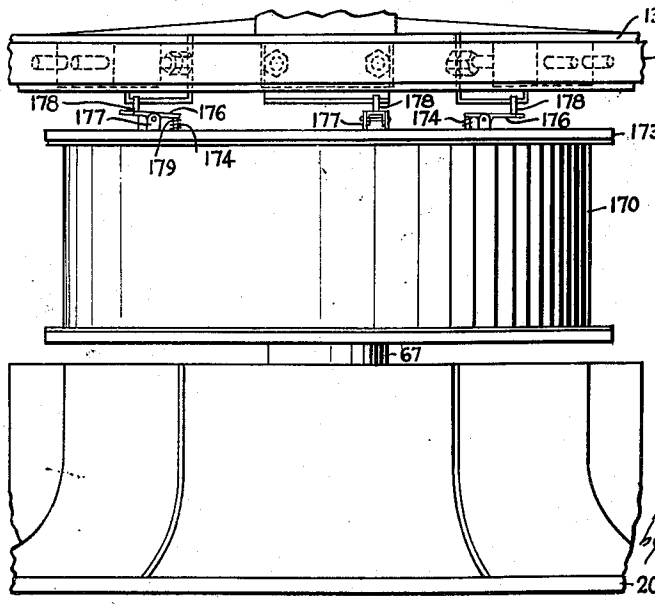


Fig. 7.



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Fig. 9.

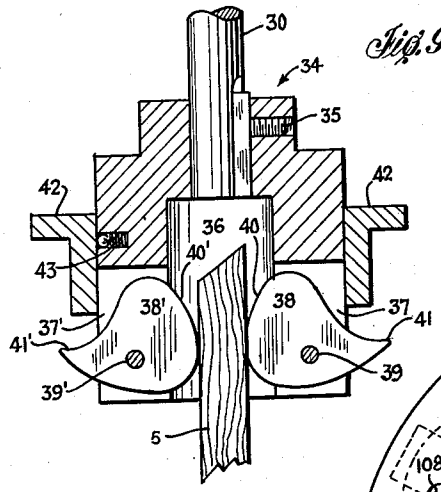


Fig. 10.

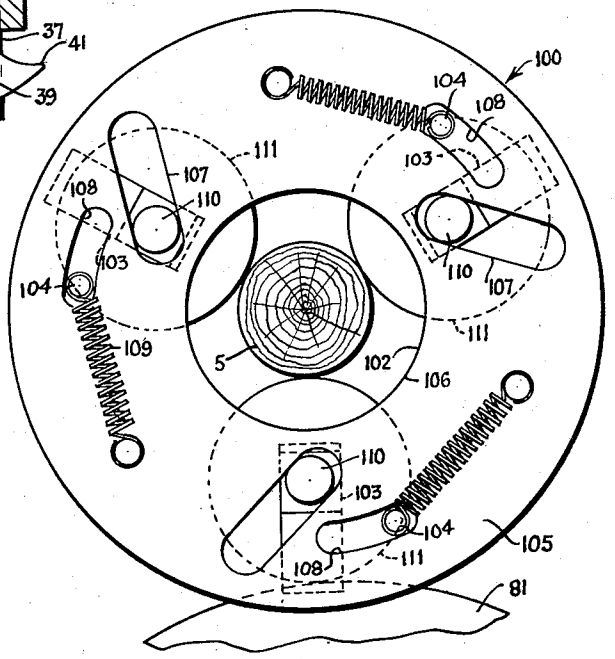
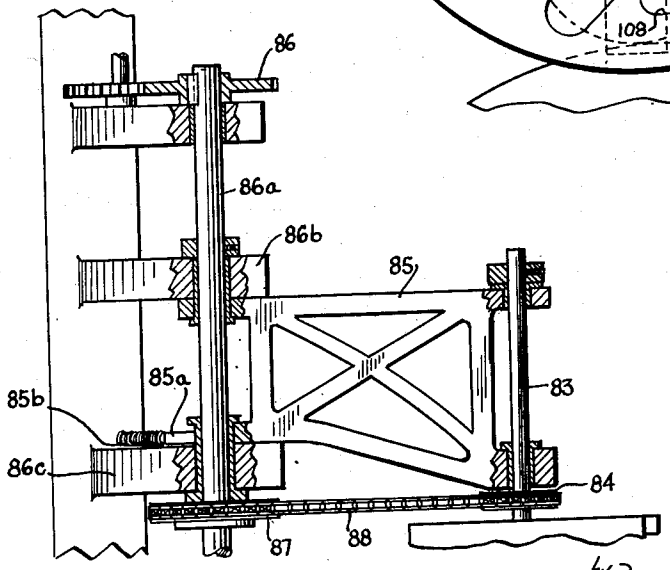


Fig. 11.



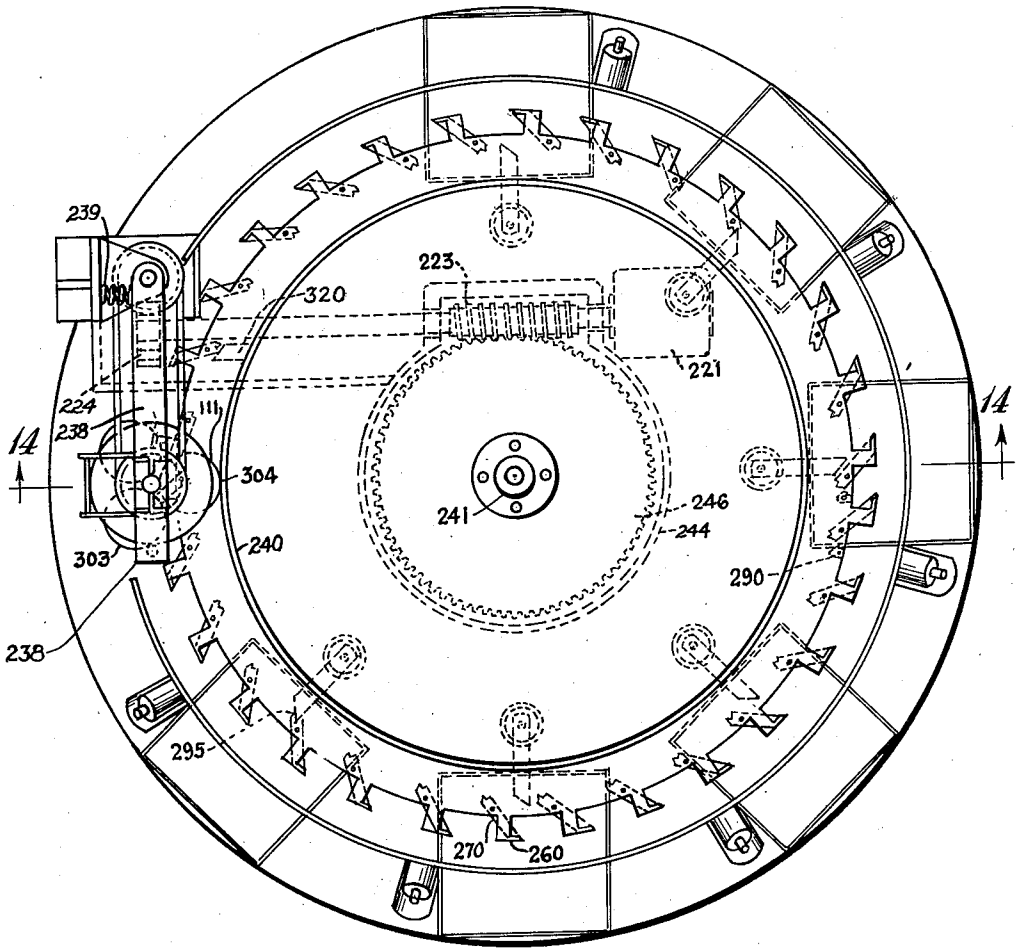
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Fig. 12.



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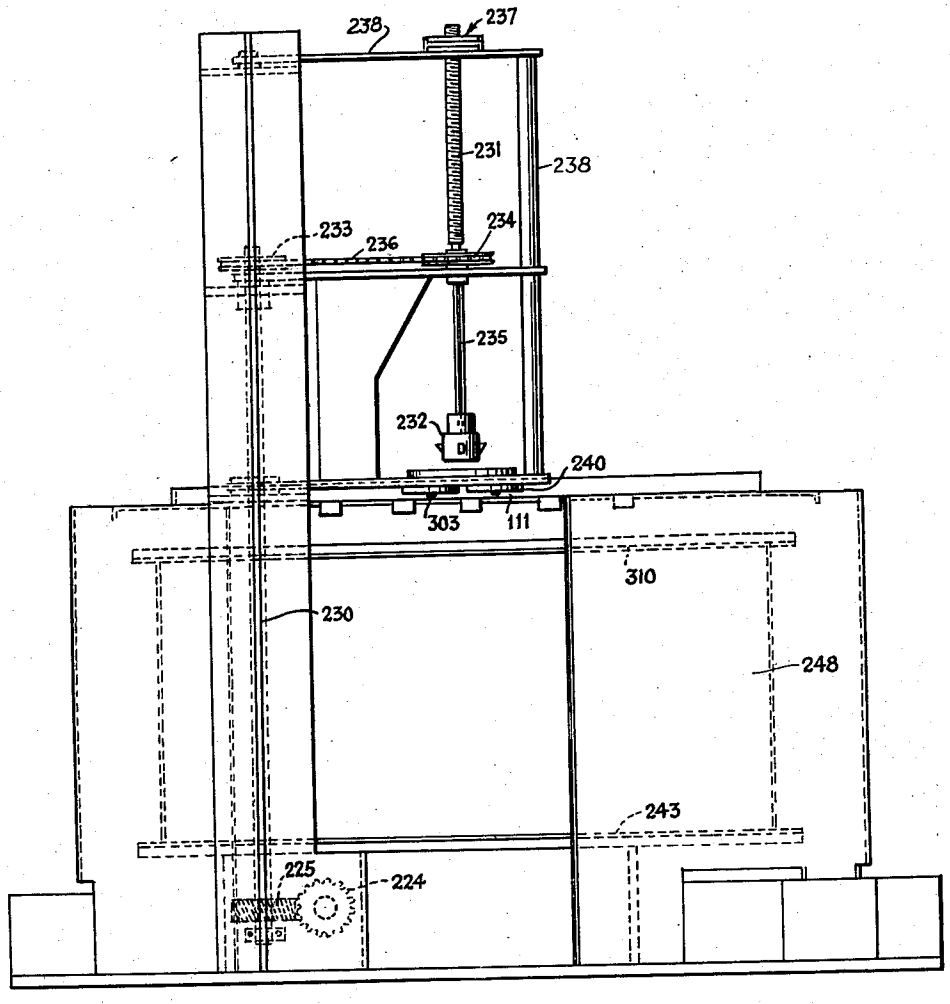
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TOBACCO STRIPPER AND GRADER

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Fig. 13.



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TOBACCO STRIPPER AND GRADER

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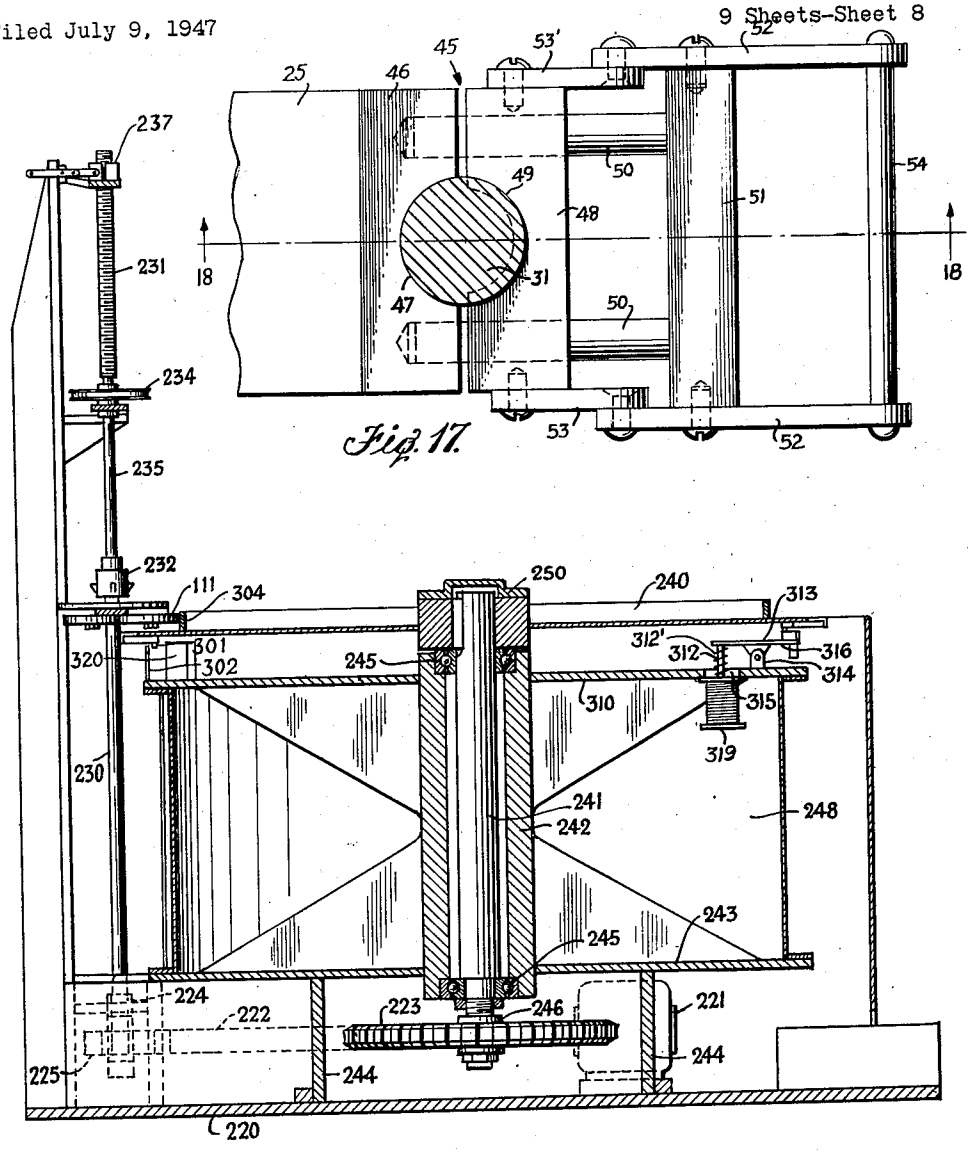


Fig. 17.

Fig. 14.

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TOBACCO STRIPPER AND GRADER

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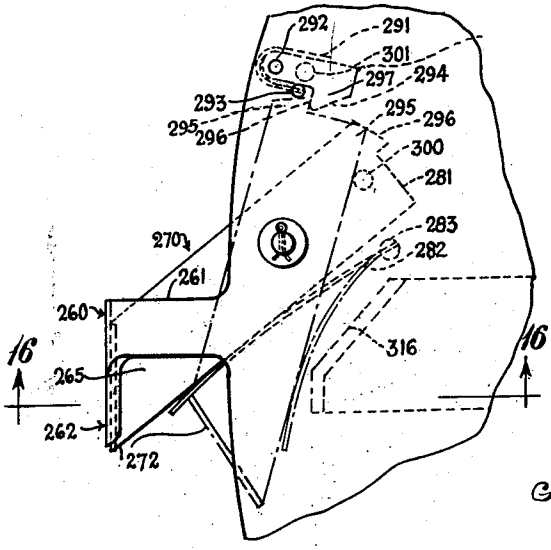


Fig. 15.

Fig. 16.

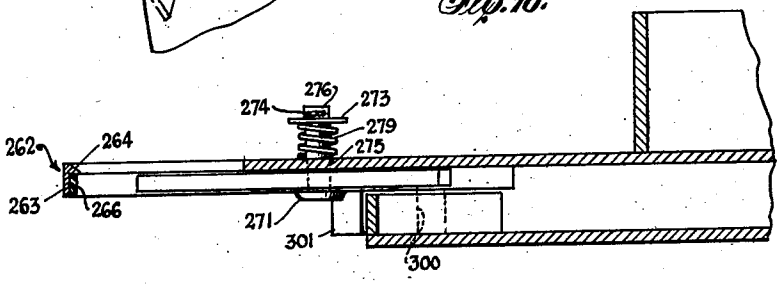
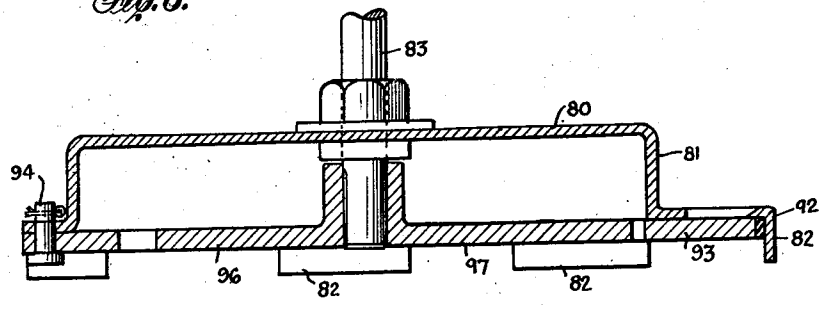


Fig. 6.



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Patented Nov. 6, 1951 2,574,030

UNITED STATES PATENT OFFICE

2,574,030

TOBACCO STRIPPER AND GRADER

Carl J. Green, Oak Ridge, Tenn.

Application July 9, 1947, Serial No. 759,834

14 Claims. (Cl. 131—131)

1

The present invention relates to a tobacco stripping and grading machine, and more particularly to a machine for automatically severing the leaves from a tobacco stalk and sorting them individually according to grades characterized by prescribed variations in color or shade.

Heretofore, the operations of cutting tobacco leaves from the stalk and sorting them according to prescribed grades required in the preparation of a tobacco crop for market, have been conventionally performed by manually stripping the leaves from the tobacco stalk and sorting them according to certain prescribed standards of color, the lighter shades of reddish-brown being characteristic of the better quality leaves, and correspondingly darker shades of reddish-brown being indicative of the less desirable grades of tobacco. The practical limitations in attainable accuracy when performing such an operation manually, where the difference in shading or coloring of the different groups is very slight, are obvious. The provision therefore of a mechanical device capable of severing the leaves from the stalk and accurately discriminating between differences in coloring of leaves barely perceptible to the human eye for automatically performing both of these operations is of obvious desirability in the interest of reducing the time consumed in effectively grading the leaves and insuring consistent adherence to the prescribed grading standards not subject to individual variation.

Accordingly, an object of the present invention is the provision of a machine for automatically severing the leaves from a tobacco stalk and sorting them according to grades.

Another object is the provision of a machine for automatically severing the leaves from a tobacco stalk and sorting them according to variations in color and of shades of the same color with extreme rapidity and accuracy.

Another object is the provision of a machine for automatically severing the leaves from a tobacco stalk and depositing them at predetermined stations in accordance with their color or shade characteristics so as to assemble all of the leaves of a predetermined color or shade in one place.

Another object is the provision of a machine for automatically severing the leaves from a tobacco stalk and grading and sorting them according to variations in color or shade, which is capable of accurately discriminating between variations of coloring barely perceptible to the eye.

Another object is the provision of a machine for automatically severing the leaves severally from a tobacco stalk and grading and sorting

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them according to variations in color or shade, which consistently adheres to prescribed grading standards with extreme accuracy.

Another object is to provide apparatus for automatically stripping and grading tobacco leaves having means for presenting a tobacco stalk containing the tobacco leaves into successive operative positions before a stripping mechanism which successively removes the individual tobacco leaves, and conveyor means for delivering the individual tobacco leaves to one of a plurality of stations corresponding to different shades and grades of tobacco.

Another object is to provide apparatus for automatically stripping and grading tobacco leaves having a chuck for holding and rotating the tobacco stalk adjacent a stripper wheel which cuts off the individual leaves from which the leaves may be conveyed to one of a plurality of stations corresponding to different shades and grades of tobacco.

Another object is to provide apparatus for automatically stripping and grading tobacco leaves having means for stripping and conveying the individual tobacco leaves to one of a plurality of stations corresponding to the different shades and grades of tobacco.

Another object is to provide apparatus for automatically stripping and grading tobacco leaves having means for a conveyor to carry the individual leaves past a plurality of stations, and means responsive to predetermined grades or shades of tobacco for releasing the individual leaves into the predetermined station.

Other objects, advantages and capabilities of the invention will become apparent from the following description, taken in conjunction with the accompanying drawings showing only a preferred embodiment of the invention, in which:

Figure 1 is a perspective view of a tobacco stripping and grading machine constructed in accordance with the preferred embodiment of the present invention;

Figure 2 is a section view of the machine taken along the lines 2—2 of Figure 4;

Figure 3 is a top plan view of the machine omitting the split nut support at the top of the vertical frame;

Figure 4 is a view of the machine partially in section and partially in elevation;

Figure 5 is a detail plan view of the stripper mechanism;

Figure 6 is a section view of the stripper mechanism of Figure 5 taken along the lines 6—6 of Figure 5;

Figure 7 is a section view of a portion of the

machine taken along the lines 7—7 of Figure 3;

Figure 8 is a schematic diagram of the electrical amplifying circuit associated with the selector means of the present invention;

Figure 9 is a detail section view of the chuck for holding the tobacco stalk;

Figure 10 is a detail plan view of the centering roll mechanism for positioning the stripping mechanism relative to the stalk;

Figure 11 is a partial detail elevation along the line 11—11 of Figure 3;

Figure 12 is a plan view of a modified form of the invention;

Figure 13 is an elevational view of Figure 12 looking toward the apparatus from the side on which the cutting and stripping mechanism is located;

Figure 14 is a side sectional elevation on line 14—14 of Figure 12;

Figure 15 is a detailed plan view of one of the severing and clamping mechanisms attached to the turntable shown in Figure 12;

Figure 16 is a partial vertical section of Figure 15;

Figure 17 is a top plan view of the half-nut locking assembly for initially positioning the spindle vertically; and

Figure 18 is a vertical longitudinal section of the half-nut lock assembly taken along the line 18—18 of Figure 17.

Like reference characters refer to corresponding parts throughout the drawings.

In general, the tobacco stripping and grading machine according to the present invention comprises a continuously driven stripping mechanism for shearing the leaves from a tobacco stalk, a continuously driven positioning device for holding the tobacco stalk and imparting both rotary and vertical motion to the stalk for bringing the stems of the leaves individually into operating relation to the stripping mechanism, a series of light-sensitive photo-electric cells responsive to certain selected colors or shades corresponding to distinct grades of tobacco, a series of collectors or stations disposed adjacent the photo-electric cells, a conveyor mechanism for collecting the leaves as they are severed from the stalk and carrying them past the photo-electric cells, and a series of release devices associated with each of the photo-electric cells and operably associated with the conveyor mechanism for causing the conveyor mechanism to release the leaves into the collectors adjacent the photo-electric cells when a cell receives light reflected from the leaf before it of the color to which it is responsive, such that all the leaves of any selected color grade will be deposited in one of the collectors.

Referring now to the drawings, and particularly to Figures 1, 3 and 4, mounted on a horizontally extending base member 20 is a vertically extending frame member 22 for supporting the stripping and stalk positioning mechanisms, and having horizontal supporting arms 23, 24, 25 and 77 extending laterally therefrom.

A spindle 30, having a threaded portion 31 and a keyed shaft 32 is mounted with its threaded portion 31 in a threaded split-nut device, to be later described, supported by arm 25, the spindle being positioned with its axis disposed vertically, and carrying a chuck member 33 on the lower end thereof adapted to grasp the tobacco stalk 5 and hold it with its axis in a vertical position.

The chuck 33, as shown in detail in Figure 9, comprises a hub 34 keyed to the spindle 30 and secured in that position on the spindle 30 by means of set screw 35. The hub 34 is provided with a center recess 36 in its lower surface and a plurality of recesses 37, 37' extending outwardly from recess 36, housing a corresponding number of cams 38, 38' pivotally mounted therein on pins 39, 39'. The cams 38, 38' are provided with faces 40, 40' which may, if desired, be roughened to improve their gripping characteristics as by providing serrations, the faces being disposed inwardly and tripping extensions 41, 41' extending outwardly of the hub 34 by which the orientation of the cams 38, 38' may be controlled. The cams 38, 38' are so designed that the radius of each cam in a direction towards the center of the hub 34 increases as the tripping extensions 41, 41' are moved upwardly toward the spindle 30. Surrounding the hub 34 is a releasing sleeve 42 adapted to be moved axially along the hub 34 and having resilient means 43 disposed between the adjacent surfaces of the sleeve 42 and the hub 34 for retaining the sleeve 42 at its position of adjustment vertically along the hub. It will be readily observed that insertion of the stem of the tobacco stalk into the recess 36 will bring the stem into engagement with the serrated faces 40, 40' when the tripping extensions 41, 41' are urged upwardly, rotating the cams 38, 38' to the proper separation of faces 40, 40' for the stem, so that any subsequent upward movement of the extensions 41, 41' will result in the stem being rigidly clamped between the adjacently disposed faces of the cams 38, 38'. When it is desired to disengage the cams from the stem of the stalk, movement of the release sleeve 42 toward the lower end of the hub 34, either manually or by engagement with a fixed stop, brings the lower face of the sleeve 42 against the tripping extensions 41, 41' and forces them downwardly, rotating the cams 38, 38' so that the serrated faces 40, 40' are removed from engagement with the stem of the stalk to release the stem. Three or more of such cams are required to properly center and hold the stalk.

The split-nut support 45 carried by the arm 25 and in which the threaded portion 31 of the spindle 30 is mounted, comprises a fixed half-nut element 46 secured to the arm 25 and having a half-cylindrical smooth recess 47 therein, and a second half-nut element 48 having a threaded recess 49 in the adjacent surface thereof, the element 48 being mounted slidably on a pair of guide rods 50, threaded into and extending perpendicularly to the outer face of the fixed element 46 at either side of the recess 47. The guide rods 50, extend through the element 48 and support a block 51. A pair of lever members 52, 52' interconnected at their free ends by a tubular element 54 are pivotally mounted on each side of the block 51, and are connected by pivoted links 53, 53' to the movable half-nut element 48 such that movement of the free end of the lever members 52, 52' downwardly toward the spindle 30 forces the movable half-nut element 48 along the guide rods 50, away from the threaded portion 31 of the spindle 30 and from the half-nut element 46 to disengage the split-nut support 45 from the spindle 30 and permit the latter to fall vertically. Suitable arresting means to resiliently arrest the fall of the spindle 30 may be provided in the form of a coil spring 55 adapted to resiliently support a collar 56 adapted to engage a second collar or stop 57 on the spindle 30. The purpose of this resilient means is to cushion the fall of the spindle 30 and chuck 33 in

the event the operator releases the half-nut 48.

The spindle 30 is continuously driven from an electric motor 60 supported on the base 20 through a chain of gears and sprockets to be described. The shaft 61 of the electric motor 60 is suitably journalled in support member 62 mounted on base 20 and provided with a worm gear 63 engaging a spur gear 64 mounted on a vertical shaft 65 journalled at each end in bearings 66, 66' in housing 67 supported on the support member 62, to impart rotation from the shaft 61 of the electric motor 60 to the vertical shaft 65. An extension 68 of the vertical shaft 65 is provided with a sprocket gear 69 imparting rotation through the chain 70 coupled thereto to chain sprocket gear 71 on a short jack shaft 78 journalled in 24a integral with supporting arm 24 and a supplemental arm 77. A suitable spur gear 72 is fixed to the jack shaft 78 and is adapted to drive the spur gear 74 which is slidably keyed to the shaft 32 of spindle 30 through a gear chain including idler gears 75 and 76 which are respectively journalled on short shafts extending between the arms 24a and 77a. A suitable friction clutch 73 is provided for coupling the spur chain gear 71 to the jack shaft 78.

It will be apparent from the foregoing description that the continuous rotation of the shaft 61 of the electric motor 60 will be transmitted through the worm and spur gears 63 and 64, vertical shaft 65 and extension 68, sprocket gears 69 and 71 through chain 70, clutch 73, driving gear 72, and idler gears 75 and 76 to the gear 74 keyed to the keyed shaft 32 of the spindle 30, to rotate the spindle 30 and the chuck 33 affixed to the lower end thereof at a predetermined rate in a clockwise direction when viewed from the top, and at the same time impart a continuous vertical movement to the spindle 30 by reason of the engagement of the threaded portion 31 with threaded half-nut element 48 proportional to the speed of rotation of the spindle 30 and the pitch of the threads. Suitable stop or tripping means (not shown) may be positioned on the frame 22 in the path of the chuck 33 to engage the release sleeve 42 on the chuck 33 at the upper limit of travel of the spindle 30 to trip the cam tripping extensions 41, 41' and cause the tobacco stalk to be released from the chuck 33.

Referring now to Figures 1–3, 5, 6 and 11, the stripper mechanism is positioned to be continuously driven from the same source as the spindle 30 and act in conjunction therewith to sever the leaves individually from the tobacco stalk in the following manner. A disk-like plate 80 having a perpendicularly extending rim 81 mounted thereon is provided with a plurality of shearing elements 82 circumferentially spaced on the periphery of the disk 80. The disk 80 is secured to a vertical shaft 83 having a sprocket gear 84 also mounted on the shaft 83 and vertically spaced from the disk 80, the shaft 83 being journalled at its upper end in a supporting frame 85 which is pivotally mounted on an axis on the arm 24 coincident with the axes of gear 86 engaging the driving gear 72 and sprocket gear 87 secured to the gear 86. The gear 86 is keyed to a shaft 86a the upper end of which is journalled in the outer end of arm 24. The lower end of this shaft is journalled in arms 86b and 86c. A suitable chain sprocket 87 is fixed to the lower end of shaft 86a. A suitable sprocket chain 88 engages the chain sprockets 87 and 84. Through this chain drive the shaft 83 and the disk 80 of the stripping mechanism are rotated. It will be apparent that the direction of rotation of the disk 80 will be as indicated by the arrow in Figure 5 and will be the same as that of the spindle 30. The lower end of the frame 85 is provided with a boss 85a through which a spring 85b, one end of which rests against the frame 22, is adapted to resiliently urge the frame 85 in a counter-clockwise direction when viewed from above for the purpose of resiliently urging the stripper mechanism toward the chuck 33.

The shearing elements 82 lie substantially in the plane of the disk 80 and comprise a radially extending arm 90 secured to the periphery of the disk 80 and an arm 91 extending at substantially right angles to the arm 90 in the direction of rotation of the disk 80 and tapering to a point at the forward end thereof, the inner edge 91' of the arm 91 being shaped to form a shearing edge and the outer edge having a perpendicular extension 92 thereon. Associated with each of the shearing elements 82 is a movable shearing cam 93 pivoted to the disk 80 as by pins 94, each of the movable shearing cams 93 having a surface 95 riding against a stationary cam member 96 positioned beneath the disk 80 so that rotation of the disk 80 relative to the stationary cam 96 periodically rotates the movable shearing cam 93 adjacent the raised portion 97 of the cam 96 outwardly of the disk 80 to bring an edge 98 of the movable shearing cam 93 against the extension 92 of the arm 91 in closed relation with the element 82 and shearing off any object coming between the edge 98 and the shearing edge 91'. Suitable spring means, such as a spring element 99 between each of the movable shearing cams 93 and the disk 80, may be provided to resiliently urge the camming surface 95 thereof toward the stationary cam 96.

Positioned adjacent the chuck 33 immediately beneath the lower surface thereof is a centering mechanism generally indicated at 100 and shown in detail in Figure 10 for insuring the proper positioning of the shearing elements 82 mounted on the disk 80 relative to the tobacco stalk. This centering mechanism 100 comprises a fixed plate member 101 extending horizontally from a bracket on the frame 22 to a position adjacent the chuck 33, and having an opening 102 therein through which the stem of the tobacco stalk may be inserted into the recess 36 of the chuck 33. The fixed plate member 101 also has three equally spaced, radially extending slots 103, and an equal number of upright guide pins 104 mounted thereon. A movable plate member 105 is carried on the fixed plate 101, having a center opening 106 through which the stem of the tobacco stalk may be inserted, three equally spaced slots 107 oriented at an angle to the radial slots 103 in fixed plate 101, and a plurality of guide slots 108 adapted to receive the guide pins 104 in the fixed plate member 101. Resilient means such as spring 109 is coupled between fixed plate 101 and movable plate member 105 to continuously urge the movable plate 105 in a clockwise direction and cam the rollers 111 inwardly toward the axis of the plates 101 and 105.

Vertical shafts 110 are inserted through each of the radial slots 103 in the fixed plate member 101 and the corresponding angularly oriented slots 107 in the movable plate member 105 and a roller 111 journalled to the lower end of each of said shafts 110 beneath the fixed plate member 101, the edge of the rollers 111 being adapted to extend inwardly of the edge of the openings 102 and 106 in the plate members 101 and 105 and bear against the stem of the tobacco stalk in-

serted therethrough. The fixed plate member 101 and the associated plate 105 and rollers 111 are positioned vertically on the frame 22 such that the edge of one of the rollers 111 rides against the rim 81 on the shearing disk 80. Since the pivotally supported frame 85 carrying the shaft 83 and shearing disk 80 is spring urged toward the spindle 30, the rim of the shearing disk 80 will therefore be continuously held against one of the rollers 111. The shearing elements 82 of the disk 80 rotating at a fixed radius about the vertical shaft 83, the radii of the rim 81 and of the rollers 111 and their spacing from the axis of the stalk may be designed so that the shearing elements 82 are always located the proper distance from the center of the stalk to engage and sever the leaves individually as they are successively presented to the shearing elements 82 by the movement of the spindle 30, the rollers 111 being limited to radial movement only relative to the plate 101 by the radial slots 103 and continuously held in engagement with the tobacco stalk by the force of spring 109.

The positioning of the projecting portion 97 of the fixed cam 96 controlling the orientation of the movable shearing cams 93 is of a design to maintain the movable shearing cams 93 closed with the shearing members 82 over a portion of the circular path travelled by the shearing members 82 proportional to the length of the projecting portion 97. This is effective to render the shearing elements 82 operative to strip the leaves of tobacco from the stalk by positioning the disk 80, as described above, so that the tapered arm 91 of each element 82 is brought between the leaf presented thereto by the spindle 30 and the stalk to which the leaf is attached, and the movable shearing cam 93 is cammed to bring the edge 98 thereof into abutment with the extension 92 of the arm 91 and past the shearing edge 91' to sever the leaf and clamp the leaf thus severed between the edge 98 of the movable cam 93 and the extension 92 of the arm 91 on the fixed shearing element 82 for the remainder of the time that the movable shearing element is in engagement with the raised portion 97 of the fixed cam 96.

Referring now to Figures 1–4, 7 and 9, a drum member 120 is keyed to the vertical shaft 65 at 121 to be continuously driven by the electric motor 60 through the shaft 62. Fixed to the top 122 of the drum member 120 and depending therefrom are a plurality of support blocks 123 having a pair of horizontal openings 124 extending through the support blocks 123 on axes disposed substantially radially of the drum member 120, adapted to slidably receive guide rods 125, 126 extending inwardly from each of a plurality of arcuate segments 130 and position the segments relative to the top 122 of the drum member 120 so as to form the side of the drum member 120. The segments 130 are thereby rendered retractable radially from the periphery of the top 122 of the drum member 120. The number of the segments 130 and of the support blocks 123 is made to correspond to the number of shearing elements 82 mounted on the stripping mechanism disk 80, and the arc length of the segments 130 is designed so that the segments 130 mounted on the drum member 120 form a substantially continuous side for the drum 120. However, there is sufficient clearance between the sides of adjacent segments to permit the segments to move inward simultaneously. Spring coils 131 are disposed on the guide rods 125, 126 bearing against the adjacent surfaces of the segments 130 and the support blocks 123 to resiliently urge the segments 130 radially outwardly of the drum member 120, and a plate 132 is mounted between the free ends of each pair of guide rods 125, 126 having a horizontal extension 133 at the lower end of the plate 132 forming an outwardly extending cam surface 134.

Adapted to cooperate with the segments 130 forming the side of the drum member 120 for conveying the tobacco leaves in cooperation with the side of the drum 120 after severing them from the stalk is a continuous belt 140 positioned adjacent the side of the drum member 120 and guided away therefrom rearwardly of the spindle mechanism 30 and stripping mechanism 80 by guide rollers 141, 141' and around guide roller 142 journalled to rotate freely on shaft 143 mounted on supporting arm 23 on the frame 22 on a vertical axis substantially coincident with the axis of sprocket gear 71 and gear 72 spaced radially away from the side of the drum member 120 and the chuck 33. The positioning of the continuous belt 140 by means of the guide rollers 141, 141', and 142 relative to the tobacco stalk and the stripping mechanism disk 180 is such, as shown in Figure 2, that the tobacco leaves severed from the stalk by the shearing elements 82 and clamped thereon by movable shearing cams 93 are carried between the continuously driven belt 140 and the side of the drum member 120 defined by the segments 130 where the belt 140 and drum 120 join adjacent guide roller 141, the leaves being each frictionally held between the belt 140 and one of the segments 130 and carried around the circular path defined by the segments 130. The arc length of the raised portion 97 of the cam 96 is such that the movable shearing cam 93 is guided from its clamping position in engagement with the extension 92 of shearing element 82 to release the leaf carried thereby and permit it to be conveyed by the segments 130 and belt 140. The speed of rotation of the stripping mechanism and conveying mechanism are so adjusted that only one leaf is carried by each segment 130.

A housing 150 mounted on the base 20 of the machine is provided having a side 151 extending around and outwardly of the periphery of the drum member 120, provided with an opening 152 in the portion of the side 151 of the housing 150 adjacent the stripping mechanism and tobacco stalk positioning chuck 33. At various desired intervals along the side 151 of the housing 150, light-sensitive sorting or grading units are provided, comprising a light source energized directly from an alternating current source and mounted in a tube 161 to form a substantially directional beam of light directed inwardly of the housing and below the side of the drum member 120 formed by the segments 130, and a collimating lens 162 and photoelectric cell 163 of conventional design, such as a selenium cell, mounted in a tube 164 with its axis directed so as to permit light reflected from leaves conveyed by the segment 130 and belt 140 and depending below the periphery of the drum member 120 to travel through the collimating lens 162 onto the sensitized surface of the photo-electric cell 163. The number of such light-sensitive grading units will correspond to the number of different grades into which it is desired to sort the tobacco leaves.

A housing drum 170 of smaller diameter than that of the drum member 120 is mounted on the vertical shaft housing 67 surrounding the vertical shaft 65 and secured to the support member 62 fixed to the base 20. Mounted within the housing

drum 170 are a plurality of solenoids 172 affixed to the under surface of the top 173 of the housing drum 170, the armatures 174 of each of the solenoids 172 extending upwardly through an opening 175 provided in the top 173 of the housing drum 170 and coupled to one end of a lever 176 pivotally mounted on the top of the housing 170 by a yoke 177. The other end of each of the levers 176 are provided with upwardly extending pins 178 positioned, when the solenoids 172 are energized, in the path of the cam surface 134 on the extensions 133 of the plates 132. Spring coils 179 are provided surrounding the armatures 174 of the solenoids 172 between the top 173 of the housing drum 170 and the lever 176 to normally urge the end of the levers carrying the pins 178 downwardly below the plane of the path of cam surfaces 134 of the plates 132 when the solenoids 172 are de-energized.

The above-described solenoid and tripping lever units, making up the actuating device for releasing the leaves from the conveyor drum 120 and continuous belt 140, are positioned circumferentially about the top of the housing drum 170 somewhat ahead of the position of the light-sensitive grading units with which they are associated, so that when leaves conveyed past the light-sensitive units by the drum 120 and continuous belt 140 actuate one of the photo-electric cells 163, the response of the cell 163 may be transmitted to the solenoid 172 associated therewith and the tripping pin 178 on lever 176 projected upwardly into the path of the cam surface 134 on the plate 132 coupled to the segments 130 in sufficient time to engage the cam surface 134 coupled with the particular segment engaging the leaf energizing the light-sensitive grading unit and retract the segment 130, releasing the leaf positioned thereby. Disposed adjacent each of the light-sensitive grading units and below the segments 130 is a collector chute 180 adapted to receive the leaves when released from the segments 130 and belt 140.

An electrical current amplifier, shown schematically in Figure 8, is coupled between each of the photo-electric cell grade detectors 163 and a solenoid 172 to amplify the current generated by the photo-electric cell 163 when the photo-electric cell is actuated to couple the current generated to the solenoid 172 at sufficient intensities to energize the solenoid 172 to retract the armature 174 and pivot the lever 176 to a position projecting the pin 178 into the path of the cam surface 134 of plate 132, thereby forcing the guide rods 125, 126 radially toward the center of the drum 120 as the plate 132 is driven past the projecting pin 178 and the segment 130 secured thereto away from the belt 140 to release the leaf of tobacco held between the segment 130 and belt 140. The electrical connections of the current amplifier are as follows. The anode 200 of the photo-electric cell 163 is coupled through a grid resistor 201 to the tap 202 of a variable potentiometer 203 placed across the direct current output of a conventional alternating current rectifier and filter unit 204 energized from the same alternating current source as the light source 160. The cathode 205 of the photo-electric cell 163 is coupled directly to the negative terminal of a high-voltage "B" battery 206, the positive terminal of which is coupled through the resistor 207 to the positive output of rectifier 204. This is done for the purpose of providing automatic compensation in the voltage impressed across the electrodes of cell 163 if voltage fluctuations occur in the alternating current source and vary the brilliancy of light source 160, an increase in line voltage and in the direct current output of rectifier 204 producing a greater positive swing of the voltage on the cathode 205 than on the anode 200 and accordingly reducing the potential across these electrodes with an increase in the brilliancy of the light source 160.

A pair of triode amplifier tubes 208 and 210 are provided, the cathodes of the triodes 208 and 210 being coupled in series with a variable potentiometer 211 across the direct current output of rectifier 204. The plate of triode 208 is coupled through a plate supply battery 212 and a plate resistor 213 to a tap on variable potentiometer 211, the voltage at the tap of potentiometer 211 and that of battery 212 providing the plate voltage for triode 208. The plate of triode 210 is supplied through the coil of solenoid 172 from the positive terminal of the high-voltage "B" battery 206. A tap 214 is provided on the plate supply battery 212 from which the grid bias voltage for the grid of triode 210 is obtained.

When light falls on the photo-electric cell 163, current proportional to the quantity of light flows from the battery 206 and rectifier 204 through the potentiometer 203, tap 202, and grid resistor 201 through the cell 163, producing a negative voltage drop at the grid of triode 208 coupled to the top of resistor 201. The consequent reduction in plate current through triode 208 decreases the voltage drop across plate resistor 213, driving the grid of triode 210 positive and producing an increased plate current through the coil of solenoid 172 sufficiently amplified by the two stages to actuate the solenoid and project the pin 178 upward into the path of the cam surface 134. In this embodiment a two stage current amplifier is shown, but more or less stages may be provided if desired, depending on the amplification required to produce sufficient current from the photo-electric cell output to energize the solenoid 172.

The scheme of shading backgrounds and photo-sensitive cells to effect a progressive grading of the tobacco leaves where, for example, five stations are used (more or less stations may be used if desired) is as follows:

Photo-electric mechanism to operate leaf release mechanism when an object lighter than the background intercepts the light beam but not to operate when an object darker than the background intercepts the light beam as explained hereinbefore.

Station No. 1: Background to be slightly darker than the shade of the lightest colored leaf to be graded. Leaves deposited at this station will range from the very lightest leaves to those of a shade just a little lighter than the background of this station.

Station No. 2: Background a little darker than that of Station No. 1. Leaves deposited here will be those that are of a shade as dark as Background No. 1 and those that are darker than Background No. 1 so long as they are not as dark as Background No. 2.

Station No. 3: Background a little darker than that of Station No. 2. Leaves deposited here will be those that are of a shade as dark as Background No. 2 and those that are darker than Background No. 2 so long as they are not as dark Background No. 3.

Station No. 4: Background a little darker than that of Station No. 3. Leaves deposited here will be those that are of a shade as dark as Background No. 3 and those that are darker than

Background No. 3 so long as they are not as dark as Background No. 4.

Station No. 5: Background to be jet black, in order to dump all leaves too dark to have been released at any of the previous grading stations and to insure that no leaves will continue to travel in the conveying system on more than one round.

A modification of the principles involved in the practical embodiment of this invention hereinbefore described will now be set forth in which two steps in the aforementioned embodiment will be combined into one step, and other refinements in the mechanism will be readily appreciated. The salient points in this modification involve another arrangement of applying power from the electric motor to the chuck, combining the stripper mechanism with the leaf holding mechanism directly on the revolving drum, and a modification of the leaf release mechanism.

In the modified form shown in Figures 12 to 16, inclusive, a base 220 is provided, near the center of which is mounted a suitable power source such as an electric motor 221 to rotate a drive shaft 222 on which are keyed worm 223 and screw or spiral gear 224. Near the extreme end of drive shaft 222 and suitably mounted in a vertical position shaft 230 is equipped with screw or spiral gear 225 which engages screw gear 224. Shaft 230 extends in an upwardly direction such that it may transmit power from the drive shaft 222 to the chuck 232 and the chuck spindle 231 by means of V-belt pulley 233 keyed to said shaft 230 and V-belt pulley 234 through V-belt 236. The chuck and chuck spindle raising mechanism, similar to the split-nut support 45 described in the previous embodiment are located between shaft 230 which is on the extreme side of the machine and the revolving drum 240, later to be described and at such height as to provide adequate space to raise the tobacco stalk so that all of its leaves may be stripped at the approximate level of the top of the revolving drum. V-belt pulley 234 is slidably keyed to spindle 235 in like manner as previously described in the previous embodiment. The stalk holding chuck 232 and the chuck spindle 231 and the split-nut mechanism 237 are similar in all respects to those employed in the previous embodiment. The chuck spindle 231 is journaled in the swinging bracket 238 which is pivotally connected to the upright column on the frame. A suitable spring 239 is adapted to resiliently swing this bracket 238 in such a direction that the roller 111 will be in rolling engagement against the rim on the revolving drum 240.

Near the center of base 220 and mounted vertical thereto, shaft casing 242 is fixedly attached to the top 310 and bottom 243 of the fixed drum 248 which in turn is rigidly attached to base 220 by means of supports 244. Extending through shaft casing 242 and adequately journalled therein by means of suitable bearings 245, shaft 241 is rotatably mounted and has fixedly keyed to its lower extremity a suitable gear 246 to engage worm 223. A cap 250 is fixedly keyed to the upper extremity of shaft 241 which cap is made a part of and acts as the hub of revolving drum 240.

Revolving drum 240 provides a means for stripping tobacco leaves from the stalk and conveying them successively before a plurality of photo-electric means described in the previous embodiment. Stripping is accomplished by a plurality of shearing hooks 260 which in conjunction with shearing bars 270 shear the stems of the leaves as the stalk is rotated and the stems of the leaves are presented by chuck 232 to the shearing hooks. The component parts of shearing hooks 260 are the shanks 261 which are attached to the periphery of the revolving drum 240 and extend outwardly therefrom a distance slightly greater than twice the diameter of the largest tobacco stem to be accommodated. Shearing member 262 extends horizontally from the outer end of shank 261 and at right angles thereto in the direction of rotation of drum 240. By reason of its triangular cross section with an acute angle at the lower base thereof, a sharp cutting edge 264 is provided along the outer portion of cutting slot 265. Shearing member 262 and its cutting edge 264 must be wide enough in a direction radially of the drum to cut through the largest leaf stem. Leaf holding rim 263 depends from shearing hook 262.

Shearing bar 270 is designed such that when it is installed on the under side of the top of the revolving drum slightly to the rear of cutting hook 260 by means of rivet headed pin 271 the outer or shearing end 272 will be in clamping relation with the rim 263 on shearing hook 260 when it is in closed position. Resilient cushion 266 made of rubber or other suitable plastic is affixed to the shearing end 272 of shearing bar 270 to act as a positive means for holding the tobacco stem. Resilient means, consisting of a compression spring 279, and a restraining washer 273 is installed on pin 271 after it is installed through shearing bar 270, rivet head down to hold the shearing bar, through aperture 275 in the top of the drum, through spring 279 and restraining washer 273 where it is held in compression by means of cotter pin 274 inserted through aperture 276 in the pin. The purpose of this spring is to urge the shearing bar resiliently against the under surface of the top of the revolving drum so that a maximum shearing action will be obtained when it engages shearing hook 260. Resilient means in the form of a leaf spring 282 made fast to the under side of the top of the revolving drum by a slotted rivet 283 is adapted to resiliently urge the shearing bar 270 to closed position. Shearing bar 270 is held in open position by means of clapper hook 290 installed on the under side of the top of the revolving drum and pivoted on pin 292. A suitable leaf spring 291 fixed to rivet 293 urges the clapper hook 290 against rivet 293. The design of this clapper hook is such that its cam surface 294 and the cam surface 295 on the inward end of shearing bar 270 slidably engage each other as the shearing bar 270 is moved to open position. As this motion continues the projection 296 on the shearing bar 270 is engaged behind the projection 297 on clapper hook 290, thereby holding the shearing bar in open position. Cam engaging post 300 extends in a downwardly direction from shearing bar 270 and is firmly affixed thereto. The purpose of this post is to engage a suitable cam mechanism 316 controlled by the photo-electric system, described in the previous embodiment, to open the shearing bar by power derived from the rotary motion of the revolving drum.

In the event any of the shearing bars 270 have not been opened by one of the cams 316 when dropping a leaf, the unopened bars will be opened by a fixed cam 320 secured to the top of the stationary drum 310 just in front of the stalk chuck 232. By this arrangement, it is insured that all

of the shearing bars 270 are opened when they arrive at the point to engage the next tobacco leaf stem.

Post 301 extends in a downwardly direction from clapper hook 290 and is firmly affixed thereto. The purpose of this post is to engage clapper hook release 302 located near the chuck 232 on the periphery of the fixed drum top 310 and extending therefrom in a vertical position to release the shearing bar resiliently at the proper moment when the tobacco leaf is presented thereby stripping it from the stalk. Power for this operation is also furnished by the rotatory movement of the revolving drum. The clapper release post 301 must lie at all times further from the center of rotation of the revolving drum than post 300 so that there will not be a possibility of one mechanism interfering with the other.

The stalk centering device 303 is of the same design as that described in the previous embodiment except that roller 111 of the stalk centering device is adapted for rolling engagement against the rim of the revolving drum 240.

The shearing bar opening mechanism consisting of a solenoid coil 319 installed on the under side of fixed drum top 310, whose armature 312 extends through aperture 315 in fixed drum top 310 and engages release mechanism comprising a rocker arm 313 pivotally mounted on ears 314 in such a manner that the release end 316 which is the cam surface that engages post 300 on the shearing bar is held by spring 312' so that when the solenoid is de-energized release end 316 lies close to the top of fixed drum 310. However, when the solenoid is energized by the photo-electric system, the cam release 316 assumes a horizontal position in the path of the cam post 300 and by means of the inclined surface of cam 316 and the continued rotation of the drum shearing bar 270 pivots to open position.

A summary of the operation of the above-described device is as follows: With the friction clutch 73 adjusted to prevent coupling of the continuous driving force from the electric motor 60 to the driving gear 72, so that no force is applied to the spindle 30, and with the spindle 30 at the lower limit of its movement vertically, a stalk of tobacco is inserted stem-first through the openings 102 and 106 in the plates 101 and 105 of the stripper positioning mechanism and into the recess 36 in the bottom of the chuck 33, bringing the stem into contact with the serrated faces of the cams 38, 38'. After the stem is inserted fully into the recess 36, cams 38, 38' are rotated slightly by the release extensions 41, 41' to secure the stem rigidly between the serrated faces 40, 40' thereof and position the stalk in the chuck 33.

Readjustment of the clutch 73 recouples the driving force from the electric motor to the driving gear 72, imparting rotation through the idler gears 75 and 76 to the gear 74 keyed to the keyed portion 32 of the spindle 30, rotating the tobacco stalk as well as moving it at a relatively slower rate upward through the action of the threaded split-nut support 45 and threaded portion 31 of the spindle 30. Rotation of the driving gear 72 likewise drives the stripping disk 80 with its peripherally mounted shearing elements 82 through the shaft 83, sprockets 87 and 84 and chain 88, the position of the path of the shearing elements 82 being automatically adjusted by the rolls 111 surrounding and urged against the stem by the spring urged movable plate 105 and angularly arranged slots 107 therein with one of the rolls 111 bearing against the rim 81 of the disk 80 to space the disk 80 laterally the desired distance from the stalk. The path of the shearing elements 82 is so adjusted as to bring the tapered point of the arm 91 of the elements 82 between the leaf on the tobacco stalk presented to the shearing element 82 by the spindle 30 and the stem of the stalk. The raised portion 97 on the fixed cam 96 is positioned to cam the movable shearing cams 93 into a closed relation with the elements 82 immediately after the arm 91 has been brought behind the leaf to sever the leaf and clamp it between the edge 98 of the cam 93 and the extension 92 until the leaf is carried into a position between the continuous belt 140 and the segments 120 forming the sides of the drum member 120 where the leaf is further conveyed past the series of light sensitive grading stations formed by the photo-electric cells 163 and their associated illumination sources 160. The number of shearing elements 82, and of the segments 130, is the same, and the speeds at which each are driven and the spacing of the same are adjusted so that the leaf severed by each of the shearing elements 82 is picked up and conveyed by only one of the conveyor segments 130. It will be apparent that, as the spindle 30 and the tobacco stalk secured thereto are continuously elevated vertically as they are rotated, each of the leaves vertically disposed along the stalk will in turn be severed by the shearing elements 82 of the stripping disk 80 and transported to the conveyor means comprising the continuously driven belt 140 and segments 120, where they are severally exposed to the various light-sensitive grading stages surrounding the drum member 120.

In the modification we have described, the insertion of the tobacco stalks in the chuck 232 is exactly the same as in the original embodiment. The principal difference is in the fact that a separate shearing mechanism was eliminated and the shearing is accomplished by the shearing mechanisms 260 and 270 on the periphery of the revolving drum which are at the same time the leaf holding mechanism for conveying the individual leaves before the photo-sensitive cells thereby reducing working parts.

The photo-electric cells 163 are adjusted to be responsive to progressively darker tones of reddish-brown light reflected from the leaves conveyed past the cells 163, moving counterclockwise around the side 151 of the housing 150 from the point at which the leaves are picked up by the conveyor means. The color selectivity of the cells 163 may be adjusted by adjusting the threshold potential of the photo-electric cell 163 and its amplifying circuit to provide sufficient current in the plate circuit of the last stage of the amplifier to actuate the solenoid therein only when light of intensity characteristic of the color to which the stage is to be responsive is reflected into the cell 163, since the photo-electric cells are inherently somewhat color sensitive.

When a photo-electric cell 163 is energized to generate current by light of the proper color or intensity reflected from the leaf before it, the solenoid is energized through the amplifier associated therewith and its armature 174 actuated to pivot the lever 176 and project the pin 178 into the path of the cam surface 134 of the plate 132 carried by the segment 130 conveying the leaf detected, so that the plate 132 and the segment 130 to which it is secured will be cammed inwardly of the belt 140 and the leaf released

from between the belt 140 and segment 130 to fall into the collecting chute 180 associated with the energized grading station, the leaf being collected in a suitable receptacle provided at the lower opening of the chute 180.

As the grading stations are adjusted to be energized by progressively darker colors or tones, the threshold to which they are adjusted may be progressively lowered proceeding around from the point at which the leaves are introduced to the conveyor means, insuring that the better grades of tobacco leaf will be progressively released from the conveyor as they pass from better to poor grading stages.

After all the leaves have been severed from the stalk and sorted, the free end of the levers 52, 52' may be rotated downwardly, separating the sections 46 and 49 of the split-nut support 45 and releasing the spindle 30 to return under the force of gravity to its initial position occupied at the beginning of the cycle, this being accomplished manually as previously described. The clutch 73 is then adjusted to disengage the driving gear 72 from the sprocket 71 to stop rotation of the spindle 30 and stripping mechanism and permit replacing of the tobacco stalk in the chuck 33 and the commencing of another cycle of operation.

While I have particularly shown and described one particular embodiment and one modification of the invention, it is distinctly understood that the invention is not limited thereto but that various other modifications may be made in the invention without departing from the spirit and scope thereof, and it is desired, therefore, that only such limitations shall be placed thereon as are imposed by the prior art and are set forth in the appended claims.

What is claimed is:

1. A tobacco stripping and grading machine, comprising stripping means for severing the leaves from a tobacco stalk including a plurality of driven shearing elements, stalk positioning means intercoupled with said stripping means to position the leaves on said stalk successively to be engaged by said shearing elements for shearing the leaves individually from the stalk, a series of selector means each responsive to a distinct grade of leaf, a continuous conveyor having means for individually gripping the severed leaves and advancing them toward said selector means, transfer means intercoupling said stripping means and said conveyor means for transferring the individual severed leaves therebetween and release means coupled between each of said selector means and said conveyor means and actuated by said selector means on detection of leaves of the grade to which they are responsive to release the leaves from the conveyor means.

2. A tobacco stripping and grading machine, comprising stripping means for severing the leaves from a tobacco stalk including a plurality of shearing elements continuously driven in a circular path, stalk positioning means operatively coupled with said stripping means to position the leaves on said stalk separately in the path of said shearing elements for shearing the leaves individually from the stalk, a series of light-sensitive selector means each responsive to a distinct color characteristic of a desired leaf grade, a continuous conveyor having means for individually gripping the severed leaves and advancing them past said selector means, transfer means intercoupling said stripping means and said gripping means for transferring the individual severed leaves therebetween, and release means coupled between each of said selector means and said gripping means and actuated by said selector means on detection of leaves of the color to which they are responsive to release the leaf detected from the gripping means.

3. A tobacco stripping and grading machine, comprising stripping means for severing the leaves from a tobacco stalk including a plurality of shearing elements continuously driven in a circular path, stalk positioning means operatively coupled with said stripping means to position the leaves on the stalk successively in the path of said shearing elements for shearing the leaves individually from the stalk, a series of light-sensitive selector means each responsive to a distinct color corresponding to a distinct grade of tobacco, a continuous conveyor having a series of independent gripping means for individually grasping and advancing the severed leaves past said selector means progressively from the lighter color-responsive selector means to the darker color-responsive selector means, and release means coupled between each of said selector means and said gripping means and actuated by said selector means on detection of leaves of the color to which they are responsive to release leaves detected from the gripping means at a point adjacent the selector means detecting them.

4. A tobacco stripping and grading machine, comprising stripping means for severing the leaves from a tobacco stalk including a plurality of shearing elements continuously driven in a circular path, stalk positioning means operatively coupled with said stripping means to position the leaves on the stalk successively in the path of said shearing elements for shearing the leaves individually from the stalk, a series of light-sensitive selector means each responsive to a distinct color corresponding to a distinct grade of tobacco, conveyor means including a plurality of clamping elements operative to engage and carry said leaves individually past said light-sensitive selector means, and release means coupled between each of said selector means and the clamping element adjacent thereto and actuated by said selector means on detection of a leaf of the color to which they are responsive to disengage the clamping element adjacent the selector means actuated from the leaf.

5. A tobacco stripping and grading machine, comprising stripping means for severing the leaves from a tobacco stalk including a plurality of shearing elements continuously driven in a circular path, stalk positioning means operatively coupled with said stripping means to position the leaves on the stalk successively in the path of said shearing elements for severing the leaves individually from the stalk, a series of light-sensitive selector means each responsive to a distinct color corresponding to a distinct grade of tobacco, conveyor means comprising a plurality of movable segments disposed in a circular path, a continuous driven belt surrounding said segments, each segment being operative to position one of the leaves against said belt and convey the leaves individually past said light-sensitive selector means, and release means coupled between each of said selector means and the movable segment adjacent thereto and actuated by said selector means on detection of a leaf of the color to which they are responsive to move the segment adjacent the selector means actu-

ated away from the leaf detected to release the leaf from the belt.

6. A tobacco stripping and grading machine, comprising stripping means for severing the leaves from a tobacco stalk including a plurality of shearing elements continuously driven in a circular path, stalk positioning means operatively coupled with said stripping means to position the leaves on the stalk successively in the path of said shearing elements for severing the leaves individually from the stalk, a series of light-sensitive selector means each responsive to a distinct color corresponding to a distinct grade of tobacco, conveyor means comprising a plurality of radially movable segments positioned in a circular path to form a substantially continuous surface, a continuous driven belt surrounding and in engagement with said segments, each of said segments being operative to frictionally secure one of the leaves severed by said stripping means between the adjacent surfaces of said segments and the continuous belt and convey the leaves past said light-sensitive selector means, and release means coupled between each of said selector means and the movable segment adjacent thereto and actuated by said selector means on detection of a leaf of the color to which they are responsive to disengage the segment adjacent the selector means actuated from the belt and release the leaf positioned thereby from the belt.

7. A tobacco stripping and grading machine, comprising stripping means for severing the leaves from a tobacco stalk including a plurality of shearing elements continuously driven in a circular path, stalk positioning means operatively coupled with said stripping means to position the leaves on the stalk successively in the path of said shearing elements for severing the leaves individually from the stalk, a series of light-sensitive selector means each responsive to a distinct color corresponding to a distinct grade of tobacco, conveyor means comprising a plurality of radially movable segments positioned in a circular path to form a substantially continuous surface, a continuous driven belt surrounding and in engagement with said segments, each of said segments being operative to frictionally secure one of the leaves severed by said stripping means between the adjacent surfaces of said segments and the continuous belt and convey the leaves past said light-sensitive means, and release means coupled between each of said selector means and the movable segment adjacent thereto and actuated by said selector means on detection of a leaf of the color to which they are responsive to cam the segment adjacent the selector means actuated as it is driven past that selector means radially away from the belt to release the leaf positioned thereby.

8. A tobacco stripping and grading mechanism, comprising stripping means for severing the leaves from a tobacco stalk including a plurality of shearing elements continuously driven in a circular path, stalk positioning means imparting rotary and vertical movement to said stalk, spacing means coupled between said stalk and said stripping means operative to automatically space said stripping means from said stalk at a distance to position the path of said shearing elements coincident with the portion of the surface of said stalk disposed toward said stripping means to effect shearing of the leaves individually from the stalk, a series of light-sensitive selector means each responsive to a distinct color corresponding to a distinct grade of tobacco, conveyor means for carrying the leaves individually past said selector means, and release means coupled between each of said selector means and said conveyor means and actuated by said selector means on detection of a leaf of the color to which they are responsive to release the leaf detected from said conveyor means.

9. A tobacco stripping and grading machine, comprising stripping means for severing the leaves from a tobacco stalk including a plurality of shearing elements continuously driven in a circular path and operative to shear tobacco leaves off of a stalk and convey the leaves to a preselected point in the path of the shearing elements, stalk positioning means operatively coupled with said stripping means to position the leaves on said stalk separately in the path of said shearing elements for shearing the leaves individually from the stalk, a series of light-sensitive selector means each responsive to a distinct color corresponding to a distinct grade of tobacco, conveyor means operative to engage the leaves severed from the stalk at the point in the path of the shearing elements to which the leaves are conveyed by the stripping means and carry the leaves individually past said selector means, and release means coupled between each of said selector means and said conveyor means and actuated by said selector means on detection of a leaf of the color to which they are responsive to release the leaf detected from the conveyor means.

10. Tobacco stripping and grading apparatus of the type described comprising stripping means for severing the leaves from a tobacco stalk including a plurality of shearing elements and stalk positioning means operatively associated with said stripping means to position the leaves, a plurality of selector means each responsive to the color of the leaf, conveyor means having a series of independent gripping elements for carrying the individual leaves as they are severed from the tobacco stalk toward said selector means and means operated by said selector means to release the leaves from said gripping elements.

11. Tobacco stripping and grading apparatus of the type described comprising stalk positioning means mounted for rotation and vertical movement to successively present all the leaf stems on a tobacco stalk at a predetermined point, a stripping means for severing the leaves from a tobacco stalk, including a plurality of shearing elements operatively associated with said stalk positioning means, conveyor elements for separately gripping and carrying the individual leaves as they are severed from the tobacco stalk, a plurality of selector means each responsive to a predetermined leaf color disposed along the course of movement of said conveyor elements, a plurality of leaf collecting means also disposed along the course of movement of said conveyor elements, and means operated by said selector means to selectively release the leaves from the said conveyor elements into the predetermined collecting means associated with the selector means for that color and grade of tobacco leaves.

12. Tobacco stripping and grading apparatus of the type described comprising stalk positioning means mounted for rotational and vertical movement adapted to present successively all the leaf stems on a tobacco stalk at a predetermined point, a plurality of severing elements

adapted to move adjacent said stalk positioning means for severing the leaves from a tobacco stalk and having gripping means thereon for holding the severed leaves, a series of clamping means adjacent and operatively associated with said severing elements adapted to separately disengage the severed leaves from said gripping means and advance the individual leaves along a predetermined course, a plurality of selector means each responsive to a predetermined leaf color or grade disposed along the course of movement of said clamping means, a plurality of leaf collecting means also disposed along the course of movement of said clamping means and means operated by said selector means to selectively release the leaves from said clamping means into predetermined collector means associated with the different predetermined grades and colors of tobacco leaves.

13. Tobacco stripping and grading apparatus of the type described comprising stalk positioning means mounted for rotational and vertical movement adapted to present successively all the leaf stems on a tobacco stalk at a predetermined point, a turntable mounted for rotational movement having a plurality of means for severing and clamping the individual leaves and adapted to move successively past said point upon rotation of said turntable, a plurality of selector means each responsive to a predetermined leaf color or grade disposed along the course of movement of said turntable, a plurality of leaf collecting means also disposed along the course of movement of said turntable and means operated by said selector means to selectively release the leaves from said severing and clamping means on said turntable into predetermined collector means associated with that grade and color of tobacco leaves.

14. Tobacco stripping and grading apparatus of the type described comprising stalk positioning means mounted for rotational and vertical movement adapted to present successively all the

leaf stems on a tobacco stalk at a predetermined point, a turntable mounted for rotational movement having a plurality of means for severing and clamping the individual leaves and adapted to move successively past said point upon rotation of said turntable, a plurality of selector means made sensitive to colors of different grades of tobacco leaves disposed along the course of movement of said turntable, a plurality of backgrounds disposed along the course of movement of said turntable shaded to correspond with colors of different grades of tobacco leaves and operatively associated with said selector means, a plurality of leaf collecting means also disposed along the course of movement of said turntable and means operated by said selector means to selectively release the leaves from said severing and clamping means on said turntable into predetermined collector means associated with that grade and color of tobacco leaves.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
589,981	Reid et al.	Sept. 14, 1897
1,432,762	Ladd	Oct. 24, 1922
1,518,349	Olson	Dec. 9, 1924
1,612,938	Morris	Jan. 4, 1927
2,373,361	Walter	Apr. 10, 1945

FOREIGN PATENTS

Number	Country	Date
553,137	Germany	June 22, 1932
19,057	Australia	of 1934

OTHER REFERENCES

"Tobacco" by Billings—published by The American Publishing Co., Hartford, Connecticut —1875—pages 458 and 459.