

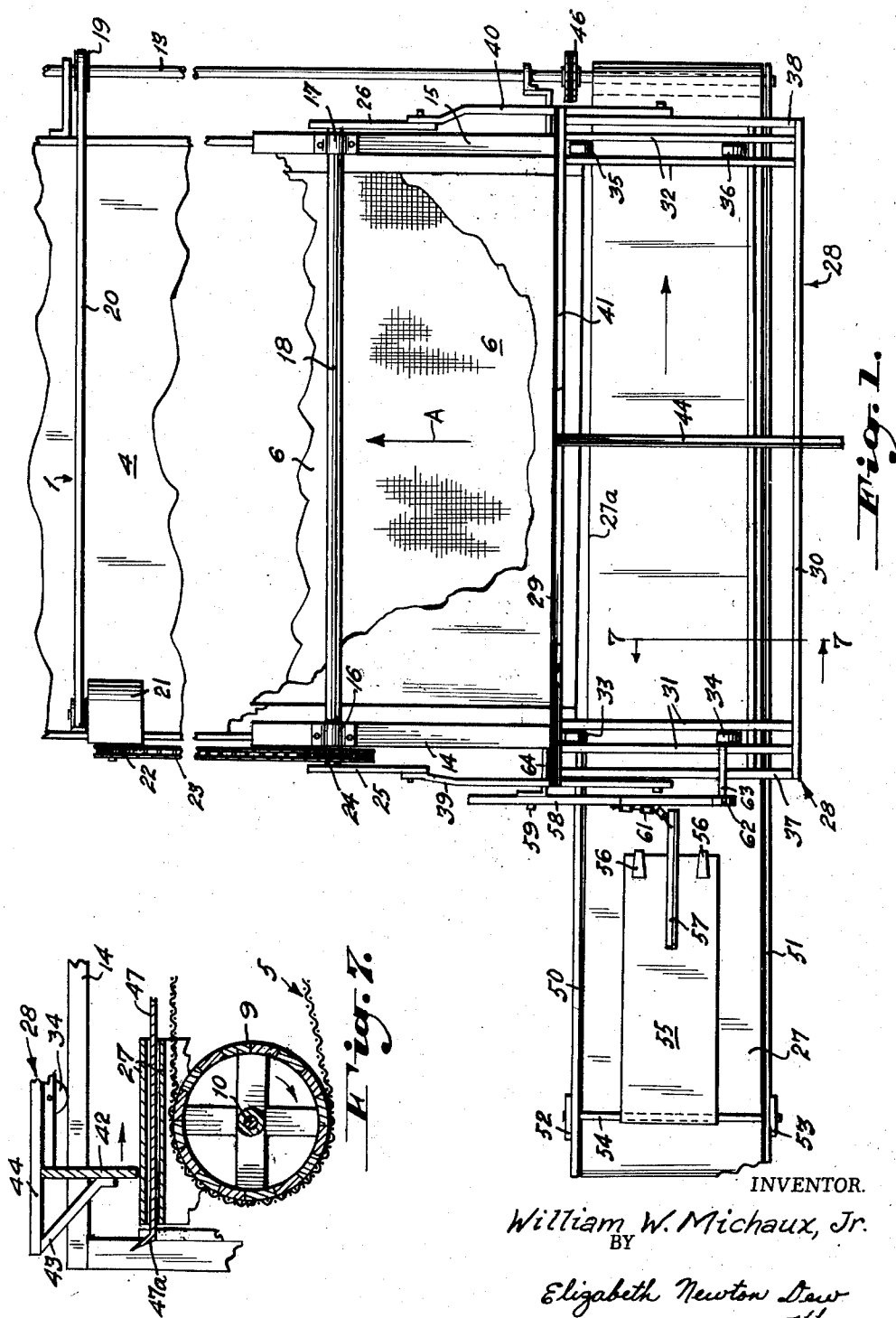
Oct. 7, 1952

W. W. MICHAUX, JR.
AUTOMATIC FEEDER AND TRANSFER MECHANISM
FOR TOBACCO ORDERING MACHINES

2,612,982

Filed May 26, 1949

3 Sheets-Sheet 1



INVENTOR.
William W. Michaux, Jr.
BY

Elizabeth Newton Daw
Attorney.

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Fig. 2.

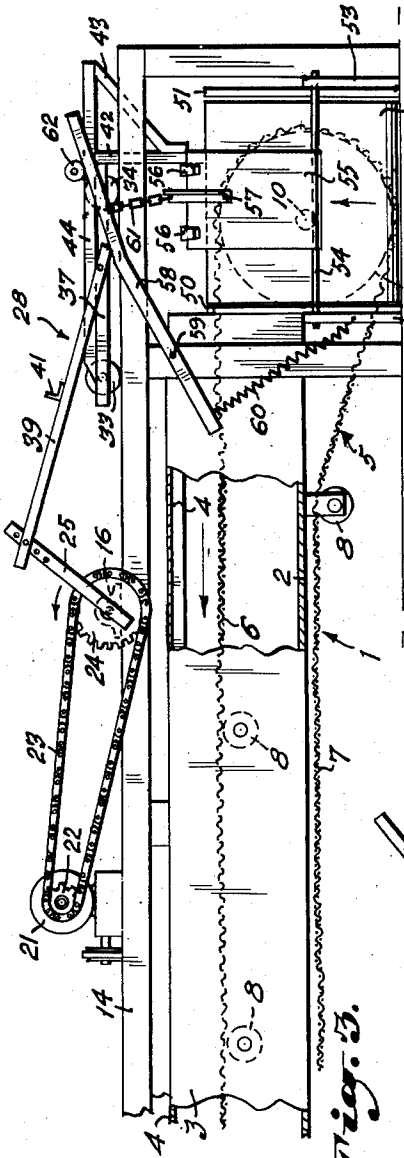


Fig. 3.

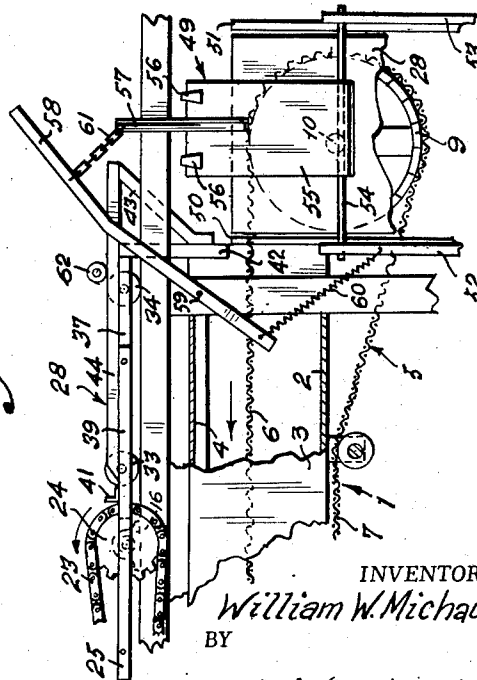
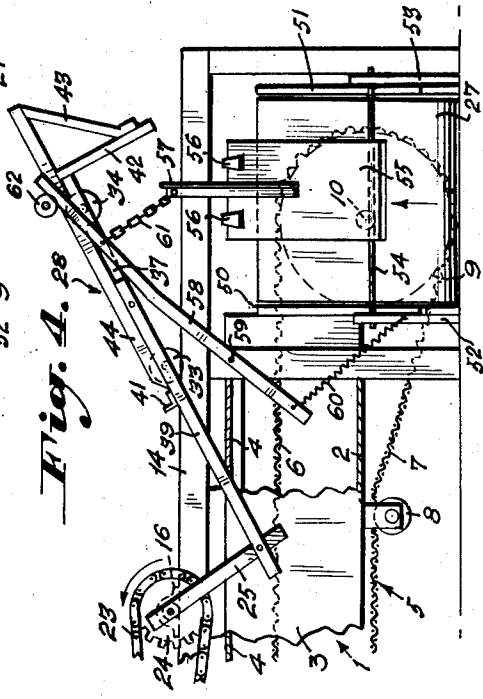


Fig. 4.



INVENTOR.
William W. Michaux, Jr.
BY
Elizabeth Newton Dew
Attorney.

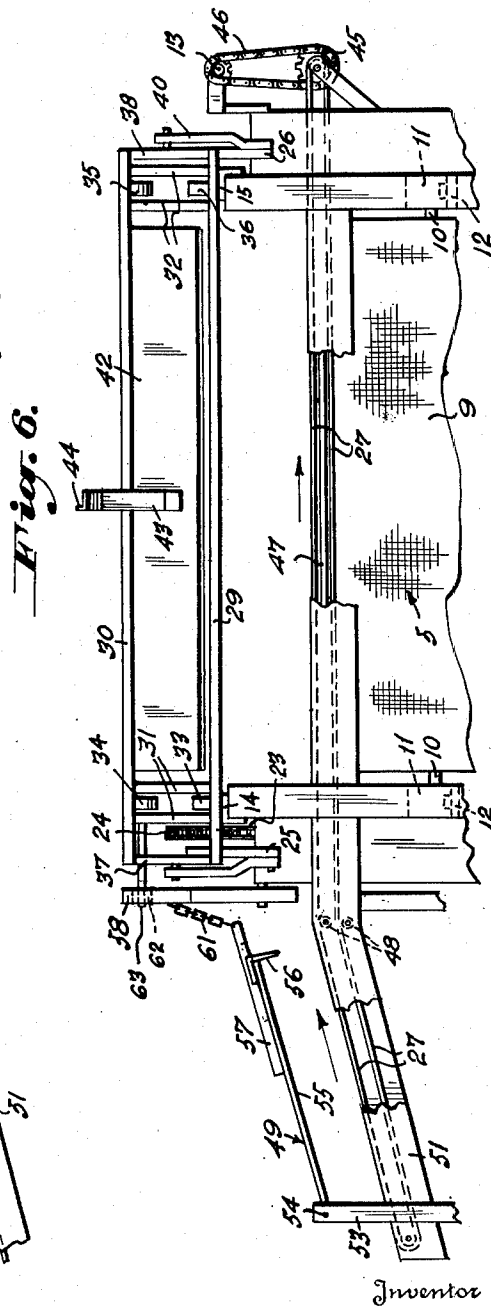
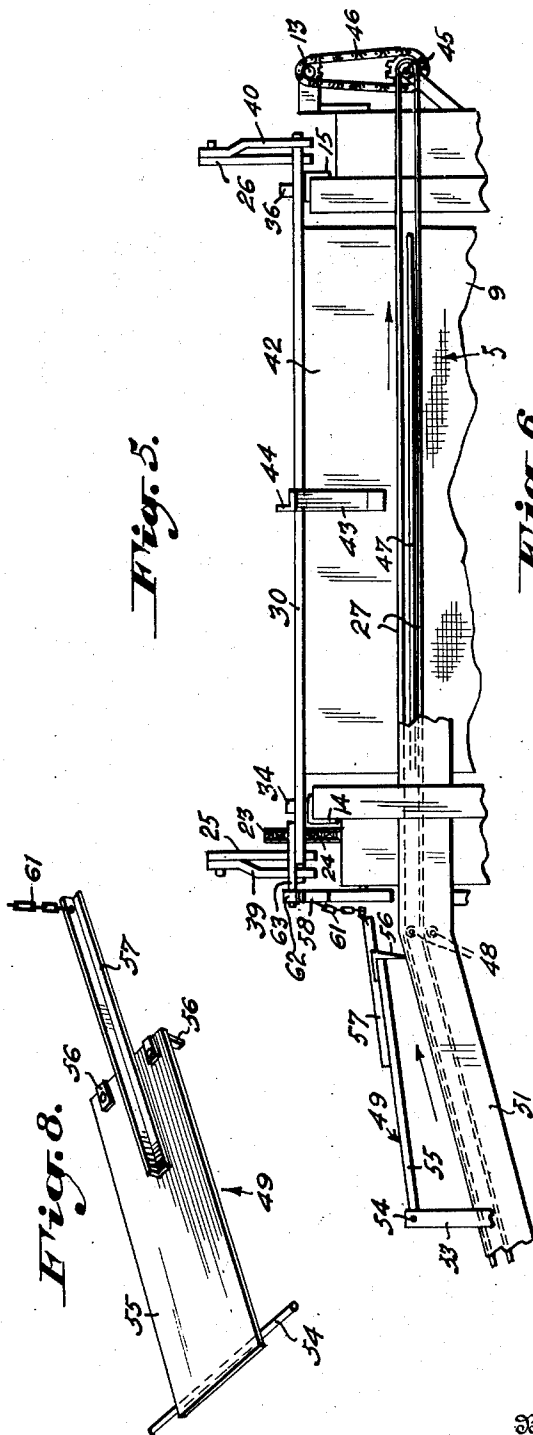
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Inventor

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William W. Michaux, Jr.
Elizabeth Newton Daw
Attorneys

UNITED STATES PATENT OFFICE

2,612,982

AUTOMATIC FEEDER AND TRANSFER MECHANISM FOR TOBACCO ORDERING MACHINES

William W. Michaux, Jr., Richmond, Va.

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3 Claims. (Cl. 198—24)

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This invention relates to a machine for loading hands of tobacco upon the belt or apron of an ordering machine in an efficient and orderly manner.

Tobacco, as it is received for processing, is in the form of bunches of leaves, or "hands." Each hand consists of a number of leaves secured together by a tobacco leaf wrapped about their butt ends and stems. The leaves comprising the hands of cured tobacco, as received by the processor, are usually dry and brittle so that they will break and crumble if an attempt is made to handle them in this condition.

For the foregoing reasons, it is customary to run the hands of tobacco through an "ordering machine" before they are fed into the stemming machine.

The ordering machine consists generally of a box or tunnel of approximately fifty to eighty feet in length and six to twelve feet wide to accommodate a wire-mesh belt six to twelve feet in width. The upper pass of this belt is supported on rollers within the box onto which the hands of tobacco are fed as the belt enters the box. Mechanism is provided to drive the belt at a slow speed. Steam is introduced into the box so that, as the hands of tobacco pass therethrough they absorb moisture. Thus as the hands emerge, the leaves are soft and pliable and the hands are then ready to run through the stemming machine to remove the stems from the leaves. The ordering box also has mechanism whereby the speed of its belt may be varied.

As previously stated, the belt of the ordering machine is six feet or more in width and runs at a speed of only a few feet per minute. Hence, for proper and economical operation, it is essential that the belt or apron be fully and evenly loaded with hands of tobacco. Heretofore, the loading of the ordering machine belt has been largely done by hand and was a relatively expensive procedure because it required a number of operators to place the hands of tobacco upon the belt in an orderly arrangement.

It is therefore the main object of this invention to provide an automatic feeder for an ordering machine which takes the place of the hand operations previously used.

Another object is to provide a feeding and loading mechanism for an ordering machine which will load the belt of the ordering machine in a uniform and orderly manner such that the machine is continuously and efficiently operated at full capacity.

A further object is the provision of a feeding

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and loading mechanism for an ordering machine which can be readily applied to existing machines without material changes therein.

A still further object is a feeding and loading mechanism of the character previously explained which is operated in timed relation with the ordering machine, relatively simple to construct and install, positive in operation, which will effect substantial reduction in labor costs in processing tobacco and which will place the tobacco in straight position upon the ordering machine apron.

Another object is the provision of a method of loading the apron or belt of an ordering machine in a time- and labor-saving manner.

Other objects and advantages will become apparent after a study of the following description in connection with the accompanying drawing wherein,

Figure 1 is a plan view of the loading end of an ordering machine with the automatic feeder of the invention attached thereto.

Figure 2 is a side elevation corresponding to Figure 1 and looking from left to right, Figure 1, with the scraper moving on its working stroke to transfer a number of hands of tobacco from the feed belt to the ordering machine belt or apron.

Figure 3 is a view corresponding to a position wherein the scraper has completed its working stroke and is about to begin its return stroke.

Figure 4 is a view corresponding to Figure 3 but showing the parts in the position wherein the scraper is descending toward the feed belt.

Figure 5 is an end elevation of the invention looking toward the ordering machine with the scraper and its operating parts in substantially the same position as that shown upon Figure 2, parts being broken away to show the feed belt.

Figure 6 is an end elevation corresponding to Figure 5 showing the scraper descending toward a working stroke and with the parts in about the same position as that shown in Figure 4, portions being broken away to show the feed belt.

Figure 7 is a detail sectional view taken in a plane indicated by the line 7—7 of Figure 1 and showing the scraper after it has moved part way across the feed belt in a working stroke, and

Figure 8 is a detail perspective view of the mechanism to obstruct the flow of tobacco upon the feed belt during the time the scraper is making a working stroke.

Referring in detail to the drawing, 1 identifies one end of an ordering machine which consists generally of a long box-like structure having a

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bottom 2, vertical sides one of which is identified at 3, and a top 4. This box is wide enough to accommodate an endless wire mesh apron or conveyor belt 5 having a horizontal upper pass 6 extending longitudinally through the ordering box and a lower pass 7 which returns beneath the bottom 2 of the ordering box. The belt is supported by any suitable means such as rollers 8, Figures 2, 3, and 4.

At the feed end of the machine, which is the end shown, at Figures 1 through 4, the belt 5 passes about a large drum 9 having a shaft 10, Figure 6, journaled in bearings 11 adjustably mounted by brackets 12 for horizontal movement to vary the tension of the belt in a manner well known in the art. Brackets 12 are carried by corner posts forming a part of the frame of the ordering machine. The belt is driven by a motor and variable-speed drive, neither of which is shown, connected to drive a shaft 13, Figure 1. Any suitable positive drive device such as gears and shafting (not shown), may be used to connect drum 9 for positive operation from shaft 13. Belt 5 may be supported and driven in a like manner at the other end of the ordering box. The structure described in the foregoing paragraphs is well known and, apart from the combination claimed, forms no part of the invention.

A pair of track members 14 and 15, Figure 1, each about six feet long, are rigidly mounted in spaced parallel relation at the respective upper corners of the ordering box. Each track has a bearing 16 and 17 fixed adjacent its rearward end. A horizontal shaft 18 is journaled in these bearings and extends completely across the machine. Shaft 18 is driven from shaft 13 by a pulley 19 on shaft 13, a V-belt 20, extending to and driving a speed reducer 21. The output shaft of speed reducer 21 carries a sprocket 22 connected by a chain 23 with a sprocket gear 24 fixed to the left end of shaft 18 as viewed in Figure 1. The speed ratios are so selected that sprocket gear 24 will be rotated on the order of twelve R. P. M. in timed relation with shaft 13.

Parallel cranks 25 and 26 are fixed to the left and right ends, respectively, of shaft 18 and have an effective radius a little greater than the width of the feed belt 27, subsequently described.

A scraper frame, generally identified by the numeral 28 and best shown at Figure 1, comprises a pair of spaced parallel transverse members 29 and 30, connected by a pair of spaced parallel end members 31 at the left end as viewed in Figure 1, and 32 at the right end. A pair of rollers 33 and 34 are journaled between members 31, as clearly shown at Figure 1, to run on track 14. Similarly a second pair of rollers 35 and 36, are journaled between members 32, to run on track 15. The scraper frame is thus mounted for translation on and along tracks 14 and 15 and, at times, as will be subsequently described, for pivoting about rollers 33 and 35.

The transverse members 29 and 30 project at each end a short distance beyond members 31 and 32. At the left these transverse members are connected by an end member 37 and at the right by an end member 38. At the left, as seen in Figure 1, a pitman 39 is pivoted at one end to the end of crank 25 and at its other end to the central portion of end member 37. Likewise at the right, pitman 40 is pivotally connected with crank 26 and the central portion of end member 38. Pitmans 39 and 40 are rigidly united about midway between their ends, by a connector

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bar 41. It will be noted upon Figure 1 that a portion of this bar has been broken away to show transverse frame member 29 lying beneath it.

A scraper or transfer board 42, which may conveniently be three-fourth inch plywood, has its upper edge secured to transverse member 30 of frame 28. This board has a length about equal to the width of conveyor belt 5, and a width such that, when all four rollers 33 through 36 rest upon tracks 14 and 15, the lower edge of the board will be a little above the top pass of feed belt 27, as clearly indicated upon Figures 5 and 7. The central portion of scraper 42 is reinforced by a brace 43 secured at one end to the board, as shown at Figure 7, and at its other end to the projecting end of a central brace bar 44 rigidly united as by welding to the central portions of transverse members 29 and 30. The frame 28 is conveniently constructed of lengths of angle iron welded together.

From the foregoing description, the movement of frame 28 and scraper 42 will be clear. When the scraper 42 is in the position shown at Figure 1, crank arms 25 and 26 are in their forward horizontal, or dead-center positions and the scraper is spaced a little beyond the adjacent edge of feed belt 27. As the cranks are rotated counterclockwise as seen in Figures 2, 3, and 4 under drive from shaft 18, chain 23 and speed reducer 21, the pitmans 39 and 40 act to draw frame 28 across feed belt 27 with its lower edge closely adjacent the belt. During this portion of the cycle, the frame is supported by all four rollers 33 through 36, as they roll upon tracks 14 and 15. Figures 2 and 7 show the positions of the parts as the scraper is part way across the feed belt in its motion to scrape or transfer tobacco from feed belt 27 to conveyor belt 5. The translation of frame 28 on and along tracks 14 and 15 continues until cranks 24 and 25 pass the rearward horizontal or dead-center position shown at Figure 3. At this instant connector bar 41 engages the rear portion of frame 28 to the rear of rollers 33 and 35 and causes the frame to tilt upwardly about the common axis of those rollers. This movement acts to raise scraper 42 sharply upwardly away from the belts. As cranks 24 and 25 continue their rotation the frame undergoes a combined translation forwardly along tracks 14 and 15 and a rotation about the common axis of rollers 33 and 35. At about the time the cranks pass the downwardly-directed vertical position, pitmans 39 and 40 permit the frame to pivot clockwise as seen in Figure 4 until, at the completion of a cycle, the parts have returned to the position of Figure 1 with the scraper ready to start a new working stroke.

Feed belt 27 has been previously mentioned. As seen in Figures 1, 5 and 6 this belt passes about a driving roller 45 driven from shaft 13 by a conventional chain and sprocket connection 46. The upper and lower horizontal passes of belt 27 extend above and below a backing board 47 rigidly supported from the legs of the frame. As best shown upon Figure 7, board 47 is wider than belt 27 and extends over belt 5 about six inches farther than belt 27. At its other edge board 47 has a longitudinally and upwardly extending lip 47a to prevent tobacco from falling off the adjacent side of the belt. It will also be noted from Figures 5, 6 and 7, that both the upper delivery pass and the lower return pass of belt 27 extend above and closely adjacent belt 5.

Belt 27 passes over guide rollers 48, Figures 5 and 6, and then turns downwardly at a small

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angle to provide a straight upper pass of any desired length, at which the feed belt may be manually loaded.

In order to prevent the hands of tobacco from piling up against the end of the scraper board during the time that it is transferring tobacco to the ordering machine belt or apron, I provide an obstructor generally identified by the numeral 49, Figures 5, 6 and 8. The side rails 50 and 51 of the belt support each has an upright or leg 52 and 53 secured thereto. These uprights pivotally support a rod 54 to which a metal plate 55 of fairly heavy gauge, is secured, as by welding. As best shown upon Figure 8, this plate has a pair of identical claws 56 secured to and projecting downwardly from its forward edge.

A bar 57 is secured at one end to the front central portion of plate 55 and extends forwardly therefrom. A lever 58, bent to the general form shown at Figures 2, 3, and 4, is pivoted at 59 upon a bracket 64 carried by the frame of the machine, Figure 1. A coil spring 60 connected at one end to lever 58 and at the other end to the frame of the machine, urges lever 58 to the fully raised position shown at Figure 3. Suitable abutment or stop means, not shown, may be provided to limit movement of lever 58 to the position shown in this figure. A section of chain 61 is attached at one end to lever 58 as shown in Figure 3, and at its other end to the free end of bar 57. Thus, when lever 58 is pivoted by spring 60 to the position shown in Figure 3, it acts to raise plate 55 about rod 54 and to elevate claws 56 out of operative relation with feed belt or apron 27.

Clockwise movement of lever 58 is controlled by a roller 62 (See Figure 1) pivoted upon a shaft 63 attached to member 37 and outer bar 31 and thus integral with frame 28. When cranks 24 and 25 are in the rear dead-center position of Figure 3 roller 62 is free of lever 58 and claws 56 are at maximum elevation approximately as shown at Figure 6. As the cranks continue their counterclockwise rotation, the roller 62, in its forward pivotal and translatory movement, picks up lever 58 at about the position shown in Figure 4. Further downward pivotal movement of frame 28 causes the lever to pivot downward against the tension of spring 60 with a corresponding downward pivotal movement of plate 55 and its claws 56 until, when the scraper or transfer board begins a working stroke, the claws are fully lowered adjacent belt 27 and act to obstruct further movement of tobacco onto the delivery pass of the belt.

The gear ratios are so selected that belt 27 moves a distance substantially equal to the width of belt or apron 5, during the time interval in which frame 28 carrying scraper 42 has started to pivot about the axis of rollers 33 and 35 on its return stroke. Thus, by the time the frame and scraper have returned to the position shown in Figure 1, ready for another working stroke, the delivery pass or section of belt 27 is fully loaded with hands of tobacco. By "delivery pass" is meant that portion of the top pass of belt 27 lying between the edges of belt 5. By "loading pass," as referred to belt 5, is meant that portion of the upper pass of this belt extending rearwardly from edge 21a of belt 27, that is, in the direction of arrow A, a distance substantially equal to, or a little greater than, the width of belt 27.

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Operation

The operation of the combined ordering machine and automatic feeding attachment will now be clear. With the machine operating, a number of attendants are stationed along the inclined section of belt 27 (which may be of any desired length), and keep this section loaded as evenly as possible, with a layer of tobacco several hands in thickness, the hands, being placed transversely upon the belt with the butt ends adjacent edge 21a. At about the time the delivery pass of belt 27 is fully loaded, scraper 42 begins its working stroke and, simultaneously engaging the forward ends of the hands, pulls or transfers them onto belt or apron 5 which then begins to move into the machine. By the time scraper 42 has completed the cycle and is again in position shown at Figure 1, belt 5 has moved the previous load of tobacco just enough to present a fresh surface of belt. At the same instant belt 27 has moved a distance sufficient so that its delivery pass is fully loaded throughout the width of belt 5. In this way, the ordering machine belt is fully and evenly loaded and operates at maximum capacity.

It is contemplated that the parts may be reversed from the position shown upon the drawing so that scraper operating mechanism operates from the opposite side of the belt 27 from the one shown to push the tobacco onto the apron or belt 5.

I have thus provided an automatic feeder for an ordering machine that is relatively simple and inexpensive to construct, reliable in operation and which can be attached to existing ordering machines without substantial alteration of the machine itself. While I have shown the form of feeder attachment now preferred by me, modifications will readily occur to those skilled in this art after a study of the foregoing disclosure. Hence such disclosure should be taken in an illustrative rather than a limiting sense. It is my desire and intention to reserve all such modifications as fall within the scope of the subjoined claims.

Having now fully disclosed the invention, what I claim and desire to secure by Letters Patent is:

1. In a feeding attachment for a tobacco ordering machine having a main belt with a horizontal loading pass, a feed belt, means for mounting said feed belt to have a horizontal delivery pass movable closely over and transversely across the loading pass of the ordering machine, a pair of spaced normally horizontal tracks fixed at right angles to said feed belt, and parallel with the main belt, a frame, scraper means on said frame, first and second pairs of coaxial rollers journaled on said frame and mounting the same for movement on and along tracks, a shaft journaled at right angles to said tracks, first and second parallel crank arms fixed to said shaft, first and second pitmans each pivoted at one end to a respective crank and at the other end to said frame to move said scraper across said feed belt in a feeding stroke, means carried by said pitmans to engage said frame at the end of said feeding stroke to pivot said frame and scraper about the axis of said first pair of rollers to thereby elevate said scraper means during the return stroke of said frame, and power-driven means driving said shaft and feed belt in timed relation.

2. In an automatic feeder for a tobacco-ordering machine, a feed belt having a normally horizontal delivery pass, a pair of spaced horizontal

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tracks fixed at right angles to and adjacent said pass, a frame, a scraper fixed with said frame for feeding movement transversely across said feed belt pass, co-axial rollers journaled on said frame, each roller rolling on a respective track to mount said frame for translation along said tracks and for simultaneous pivotal movement about the axis of said rollers, a power-driven shaft, first and second parallel cranks fixed to said shaft, first and second pitmans each pivoted at one end to a respective crank and at the other end to said frame, means carried by said pitmans to engage said frame at a predetermined point in the rotation of said cranks to pivot said frame about the axis of said rollers simultaneously with its translation along said tracks, whereby said scraper is raised from said feed belt in translation thereacross in one direction, and lowered substantially onto said belt in translation thereacross in the other direction.

3. In an automatic belt loading mechanism for a tobacco-ordering machine having a main conveyor belt with a horizontal exposed loading section at one end thereof, a feed belt narrower than said main belt, means mounting a delivery section of said feed belt for horizontal movement transversely across and closely adjacent the loading section of said main belt, power driven means connected with both belts to simultaneously drive the same at speeds such that each belt moves in its longitudinal direction a distance equal to the width of the other in the same time interval, a pair of tracks fixed adjacent and parallel with respective sides of said main belt, a scraper frame, a first pair of aligned rollers journaled on said

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frame, a second pair of aligned rollers journaled on said frame, one roller of each pair rolling on a respective track whereby said frame is mounted on said tracks for translation transversely of said feed belt and for tilting about the axis of said first pair of rollers, a shaft journaled parallel with the axes of said rollers, a pair of parallel cranks connected to said shaft at the respective ends thereof, a pair of parallel connecting rods each pivoted at one end to a respective one of said cranks and at its other to said frame, abutments on said frame engaged by the respective connecting rods to tilt said frame at one extremity of its stroke over said tracks, a scraper fixedly carried by said frame for movement therewith to transfer tobacco from said feed belt to said main belt for one direction of translation only of said frame and a drive from said power driven means to said shaft to rotate the same.

WILLIAM W. MICHAUX, JR.

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