Dec. 22, 1942. E. BURDICK 2,306,035

VEGETABLE TOPPING MACHINE

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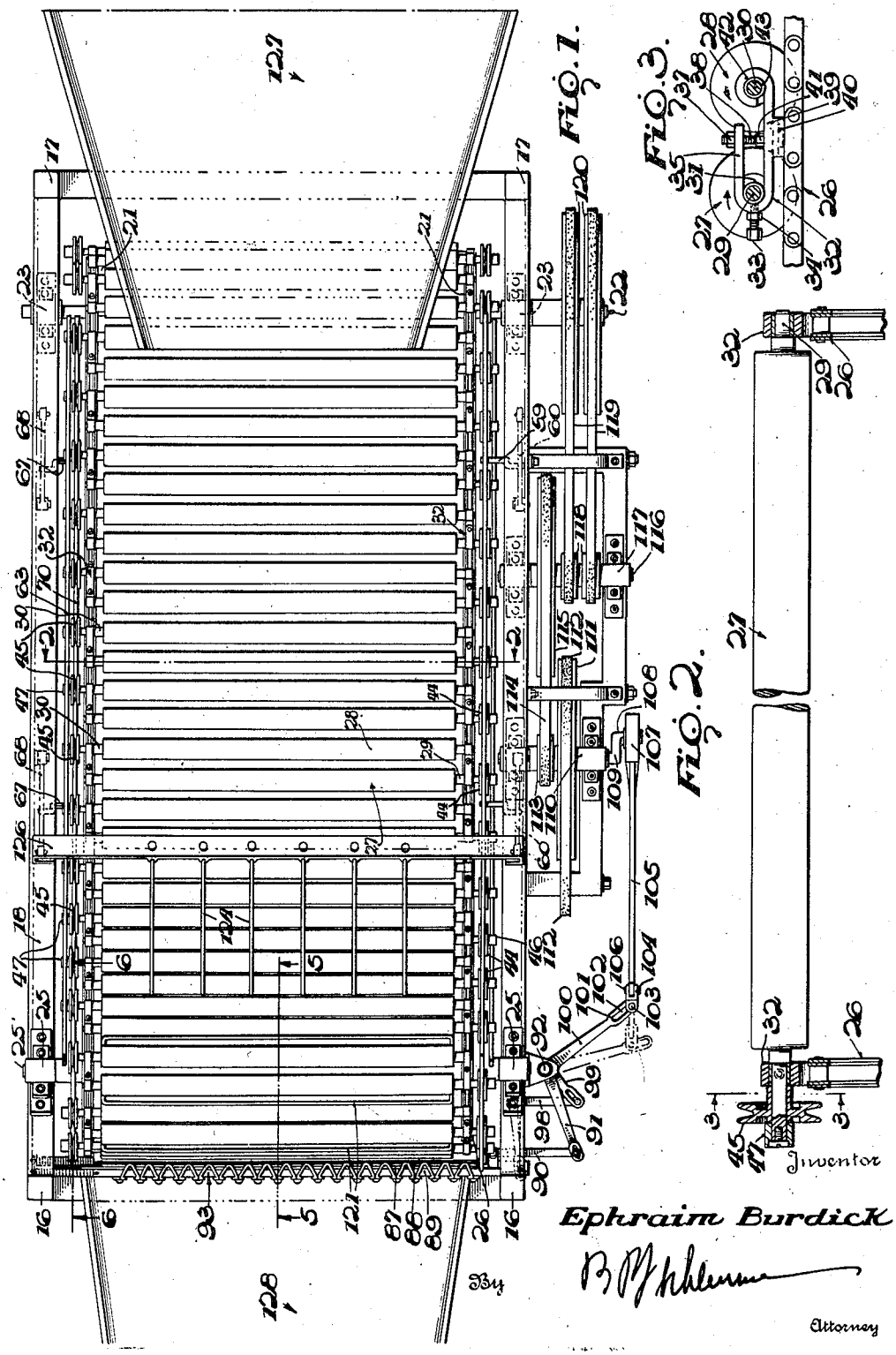


FIG. 1.

FIG. 3.

FIG. 2.

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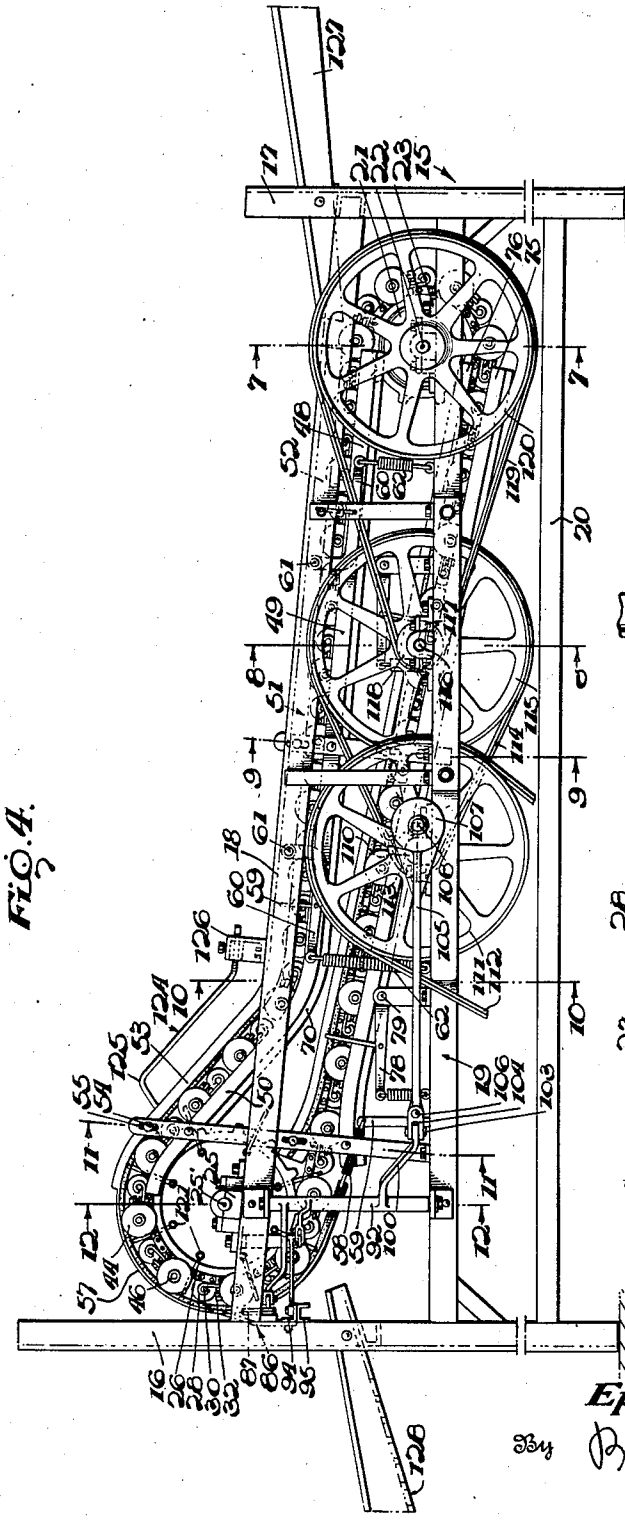


Fig. 4.

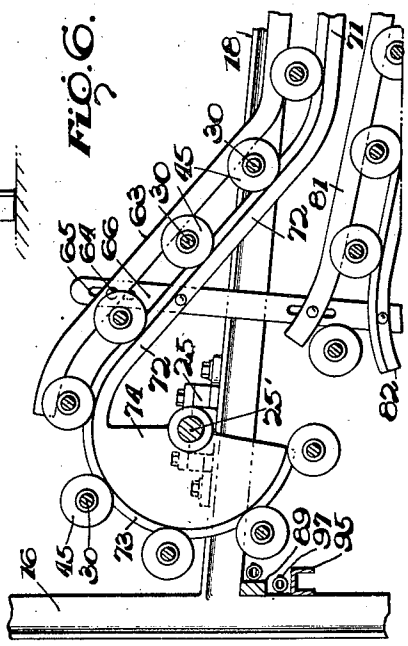


Fig. 6.

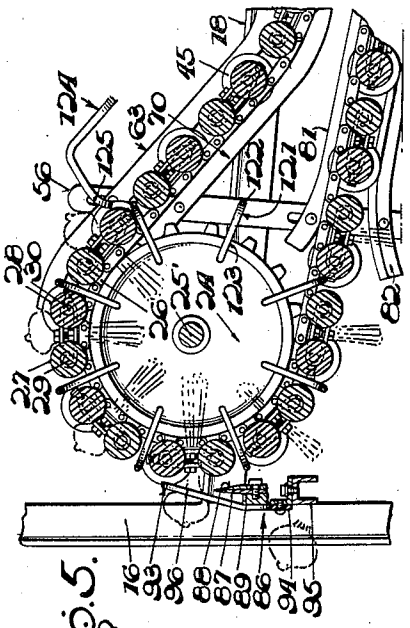


Fig. 5.

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VEGETABLE TOPPING MACHINE

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FIG. 7.

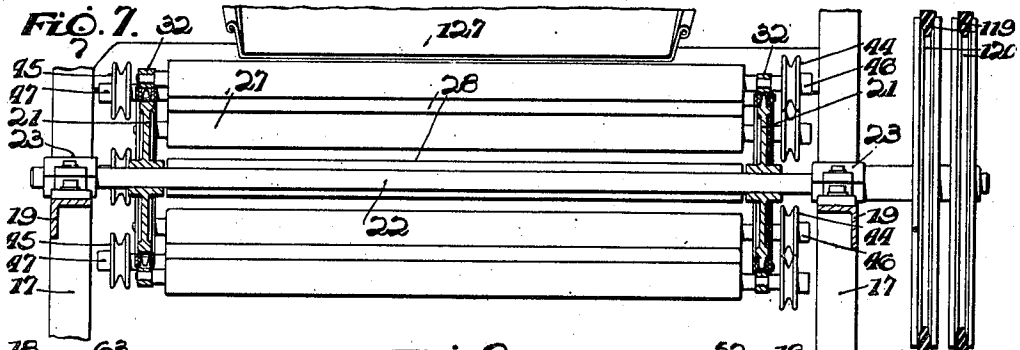


FIG. 8.

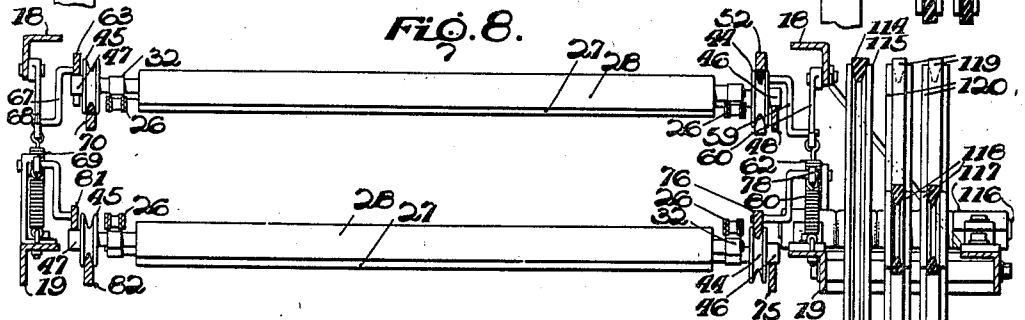


FIG. 9.

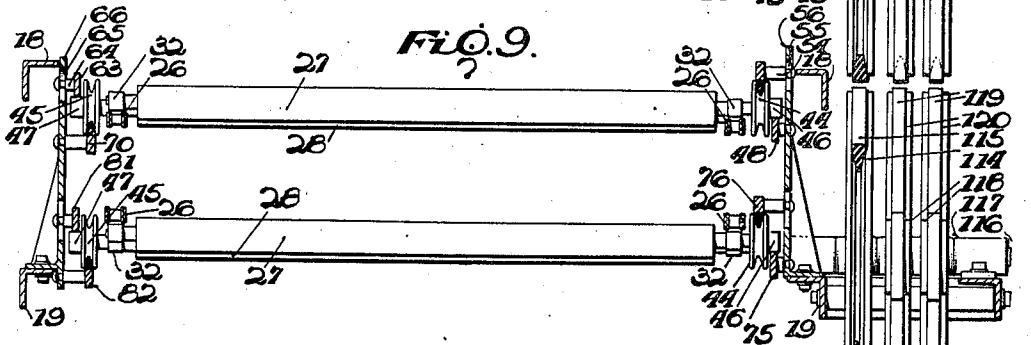
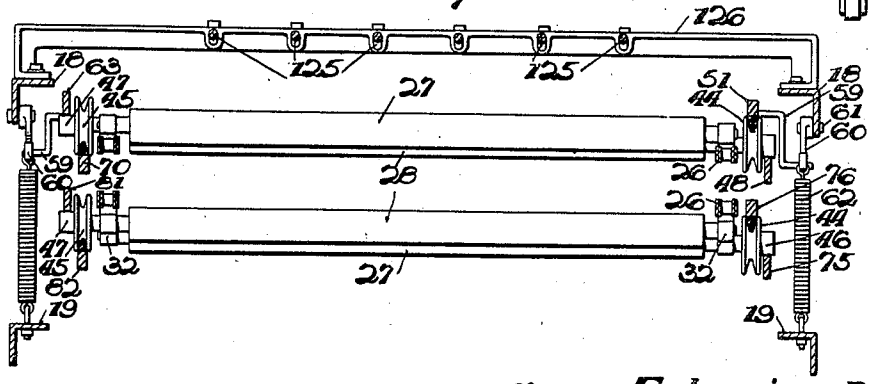


FIG. 10.



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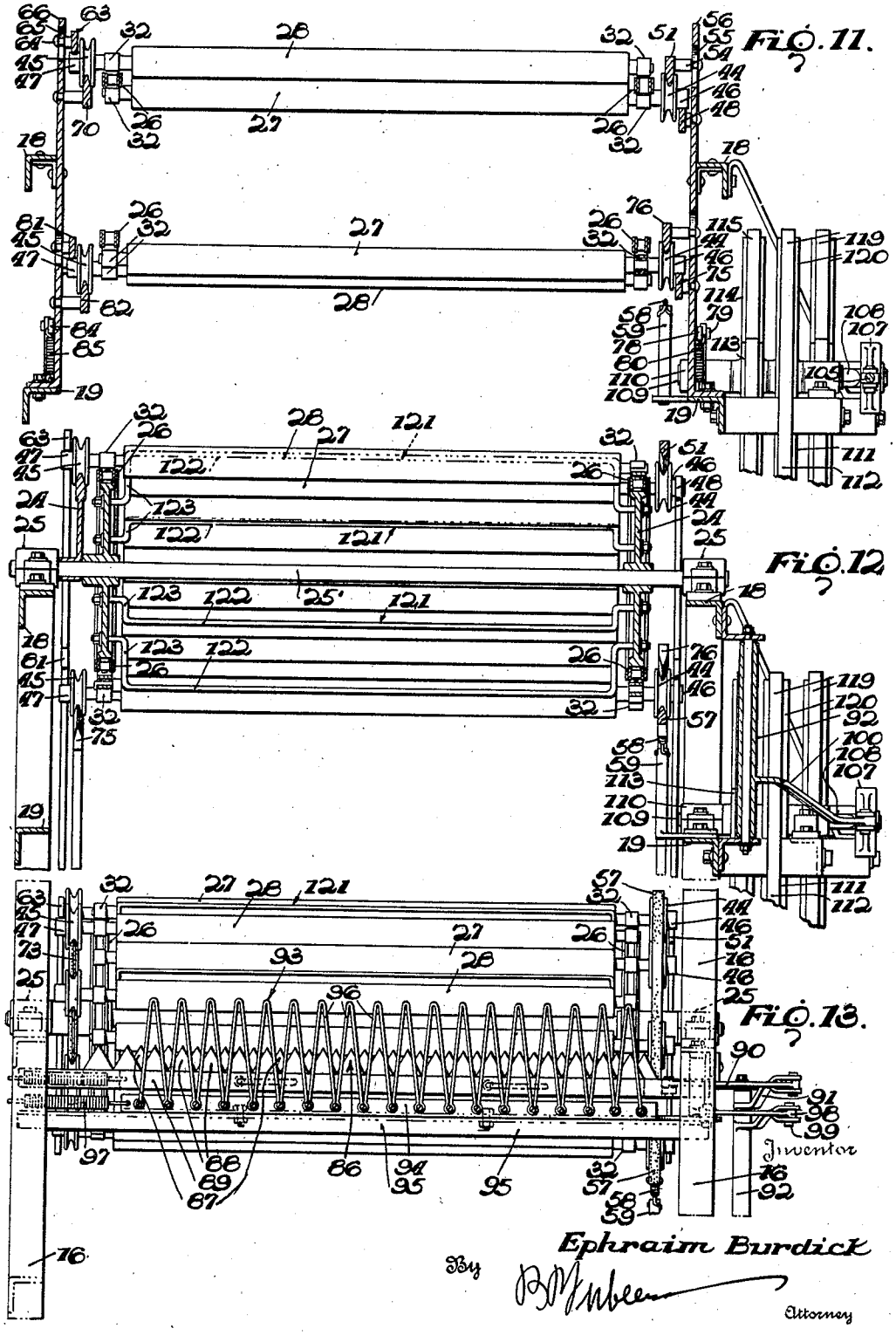


FIG. 11.

FIG. 12.

FIG. 13.

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VEGETABLE TOPPING MACHINE

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FIG. 14.

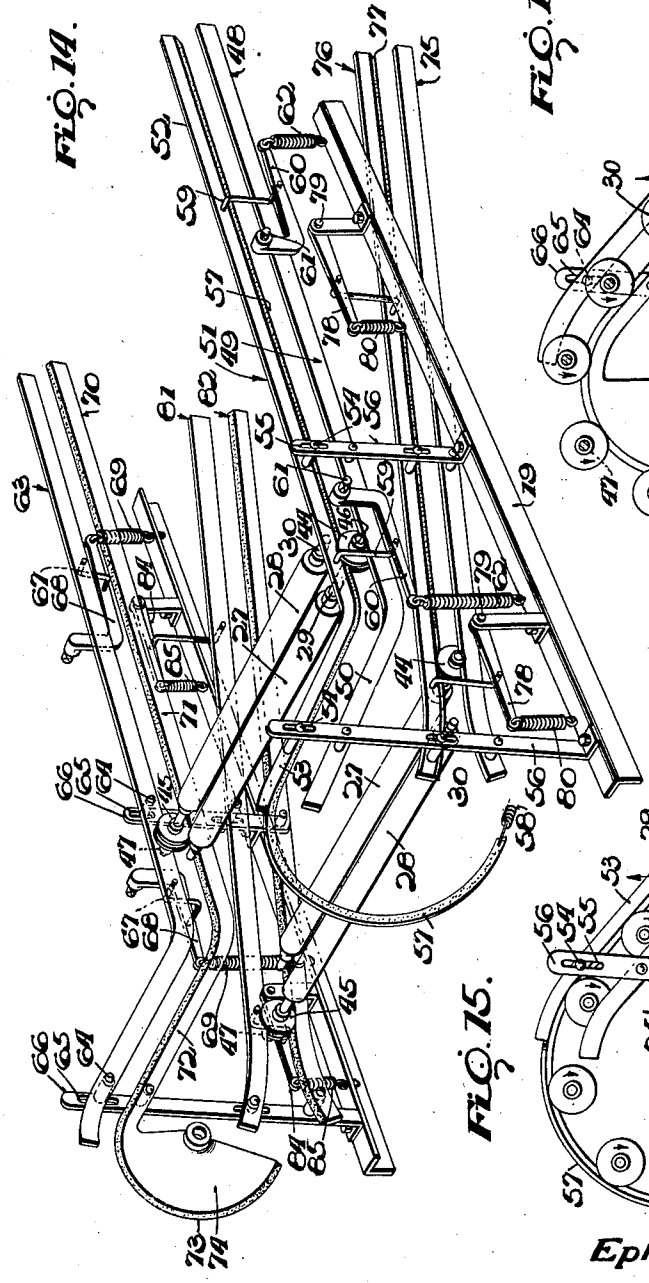


FIG. 16.

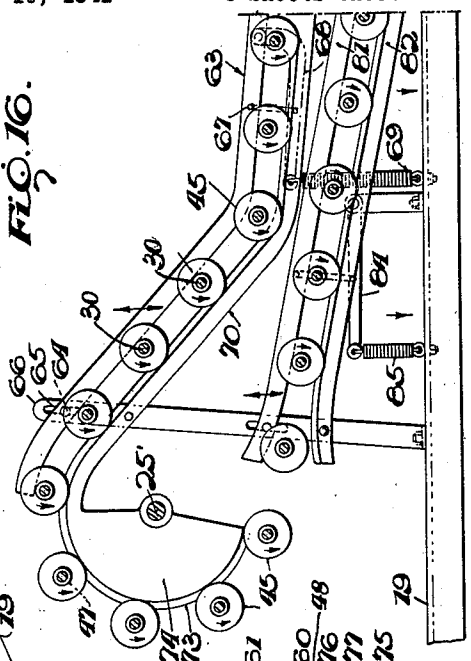
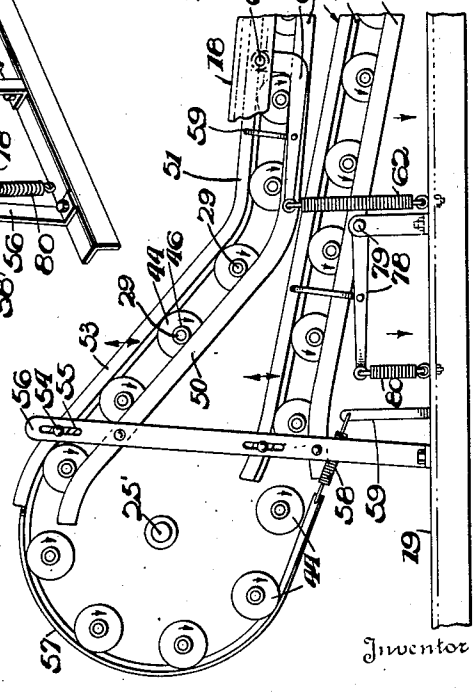


FIG. 15.



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Patented Dec. 22, 1942

2,306,035

UNITED STATES PATENT OFFICE

2,306,035

VEGETABLE TOPPING MACHINE

Ephraim Burdick, Madison, Ohio, assignor of one-half to Ulyssis Eato, Cleveland, Ohio

Application July 10, 1941, Serial No. 401,823

5 Claims. (Cl. 146—85)

My invention relates to a vegetable topping machine.

An important object of the invention is to improve the machine in general and to provide means whereby the noise produced in the operation of the machine is eliminated or greatly reduced.

A further object of the invention is to provide means to prevent the bulbs of small vegetables from falling through the spaces between the rolls of different pairs.

A further object of the invention is to provide means to prevent the topped vegetables from remaining upon the comb after the topping operation.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a plan view of a vegetable topping machine embodying my invention,

Figure 2 is a transverse section taken on line 2—2 of Figure 1,

Figure 3 is a vertical section taken on line 3—3 of Figure 2,

Figure 4 is a side elevation of the machine,

Figure 5 is a vertical longitudinal section taken on line 5—5 of Figure 1,

Figure 6 is a similar view taken on line 6—6 of Figure 1,

Figure 7 is a transverse vertical section taken on line 7—7 of Figure 4,

Figure 8 is a similar view taken on line 8—8 of Figure 4,

Figure 9 is a similar view taken on line 9—9 of Figure 4,

Figure 10 is a similar view taken on line 10—10 of Figure 4,

Figure 11 is a similar view taken on line 11—11 of Figure 4,

Figure 12 is a similar view taken on line 12—12 of Figure 4,

Figure 13 is a front end elevation of the machine,

Figure 14 is a perspective view of the roll engaging belts and associated elements, separated from the machine, for the purpose of illustration,

Figure 15 is a side elevation of the ends of the guide and pressure rails, at the discharge end of the machine, as viewed from the left side of the machine, corresponding to Figure 4, with associated elements in elevation, and,

Figure 16 is a similar view of the guide and pressure rails, upon the opposite side of the machine, but viewed from the same side of the machine as Figure 15, associated elements being shown in elevation and section.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 15 designates a frame, as a whole, comprising vertical posts 16 and 17, connected by longitudinal inclined rails 18 and horizontal rails 19 and 20.

Disposed near the intake end of the main frame 15 are sprocket wheels 21, Figures 4 and 7, rigidly mounted upon a horizontal transverse shaft 22, journaled in bearings 23, rigidly mounted upon the horizontal rails 19. Arranged near the discharge end of the main frame 15 are sprocket wheels 24, Figures 4 and 12, rigid upon transverse shaft 25', journaled in bearings 25, mounted upon the inclined rails 18. The pair of sprocket wheels 24 is arranged at an elevation above that of the sprocket wheels 21, as shown. The numeral 26 designates a pair of endless sprocket chains, arranged near the sides of the main frame 15 and engaging the sprocket wheels 21 and 24, as shown, see particularly Figure 1.

The sprocket chains carry pairs of rolls 27 and 28, disposed between the sprocket chains 26, and extending radially beyond the same. Each pair of rolls 27 and 28 are rigidly mounted upon shafts 29 and 30, respectively. The shaft 29, at each end, is rotatably mounted in a sleeve or bearing 31 which is arranged within a loop-carrier 32. The sleeve 31 is engaged by an adjusting bolt 33, engaging within a screw-threaded opening formed in the loop 32 and locked in adjustment by a lock nut 34. After the shaft 29 is moved toward the shaft 30, the outer side 35 of the loop is moved inwardly to clamp the sleeve 31 against displacement, by manipulation of a nut 37 carried by a bolt 38, passing through an opening in the inner arm 39 of the loop-carrier. This bolt is secured to a block 40 rigidly attached to one link of the chain 26 and the arm 39 is clamped to the block 40 by a nut 41. The opposite end of the arm 39 is bent into an eye 42, receiving a sleeve or bearing 43, in turn holding the shaft 30. It is thus apparent that the roll 27 may be adjusted toward or from the roll 28 and then held in the selected adjusted position.

When the pairs of rolls 27 and 28 are traveling with the upper runs of the endless chains

toward the discharge end of the machine, the roll 27 in each pair is turning clockwise, while the roll 28 is turning counter-clockwise, so that the leaves or foliage of the vegetable is drawn between the rolls in the pair, and when each pair of rolls is inverted and travels with the lower runs of the endless chains toward the take-up end of the machine, the roll 27 is turning counter-clockwise and the roll 28 clockwise, to discharge the cut leaves or foliage from between the rolls of the pair. The means which rotates the rolls 27 and 28 in each pair, in the manner stated, will now be described. Each shaft 29 carrying the roll 27 has a grooved pulley 44 rigidly secured thereto and this pulley is arranged at one side of the machine, to the right, Figures 7, 8, 9, and 10, while a grooved pulley 45 is arranged upon the opposite side of the machine and is rigidly mounted upon the shaft 30. The pulleys 44 have hubs 46 while the pulleys 45 have hubs 47, as shown.

Arranged near and beneath the upper run of one endless sprocket chain is a guide rail 48, having a rear portion 49 which is generally horizontal but slightly inclined upwardly toward the discharge end of the machine and a forward inclined portion 50, extending upwardly toward the upper portion of the sprocket wheel 24, as shown. When the pairs of rolls 27 and 28 traveling with the upper runs of the sprocket chains pass along the guide rail 48, the hubs 46 engage with the top of this guide rail, whereby the upper run of the endless conveyor produced by the sprocket chain and rolls conforms to the shape or inclination of the guide rail.

Disposed above and in vertical alignment with the guide rail 48 and above the grooved pulleys 44, in the same set, is a pressure rail 51, having a rear slightly inclined portion 52 and a forward inclined portion 53. This pressure rail is preferably rigid and carries outwardly extending pins 54, Figure 4, held within vertical elongated slots 55 formed in stationary bars 56. Extending longitudinally of the pressure rail 51 and secured thereto is a flexible belt 57, preferably tapered in cross-section to properly engage within the tapered grooves of the pulleys. At its forward end, the belt 57 extends beyond the pressure rail 51 and passes about the grooved pulleys 44 traveling over the sprocket wheel 24. The free end of this belt 57 is connected with a restractile coil spring 58, Figure 4, connected with a stationary upright 59. The belt 57 is concentric with the sprocket wheel 24 throughout the major portion of its length, but its free end extends from the sprocket wheel 24, as shown more clearly in Figure 4.

The pressure rail 51 is drawn downwardly so that the portion of the belt 57 carried thereby is held in firm engagement with the grooved pulleys, by links 59, pivotally connected with bell-crank levers 60, pivotally supported at 61. These bell-crank levers are swung downwardly by retractile coil springs 62, connected therewith, as shown.

It is thus seen that as the pairs of rolls travel forwardly with the upper runs of the endless sprocket chains, the pulleys 44 engaging with the stationary belt 57 will be rotated clockwise, while the hubs 46 will slide upon the stationary guide rail 48 and be guided thereby.

Disposed upon the opposite side of the machine with respect to the pressure rail 51 is a pressure rail 63, corresponding to the pressure rail 51, and arranged above the hubs 47 to engage therewith. This pressure rail 63 is vertically movable or adjustable like the pressure rail 51, and carries pins 64, engaging within elongated slots 65, formed in stationary bars 66. The pressure rail 63 is drawn downwardly by links 67, connected with bell-crank levers 68 similar to bell-crank levers 60 and these bell-crank levers are moved downwardly by retractile coil springs 69. The pressure rail 63 is not equipped with the stationary belt and the pressure rail engages the hubs 47.

Arranged beneath the longitudinal set of pulleys 45 is a stationary guide rail 70, corresponding somewhat to the stationary guide rail 48. The guide rail 70 has a slightly inclined rear portion 71 and an inclined forward portion 72. The stationary guide rail 70 carries a belt 73, tapered in cross-section, and arranged to enter the tapered grooves of the pulleys 45. The stationary guide rail 70 is connected at its forward end with a stationary segment 74, Figure 6, and the belt 73 continues around the periphery of the segment 74. In view of the foregoing description, it will be seen that the belt 73 is held in firm engagement within the grooves of the pulleys 45, but beneath these pulleys whereby the pulleys 45 and rolls 28 will rotate counter-clockwise as they travel with the upper run of the endless sprocket chains and about the sprocket wheels 24.

The means to rotate the roll 27 in each pair counterclockwise and the roll 28 clockwise, during their travel with the lower lengths of the endless chains, will now be described. In connection with the grooved pulleys 44 traveling with the lower runs of the endless sprocket chains, the numeral 75 designates a stationary guide rail, arranged below and engaging with the hubs 46. The numeral 76 designates a pressure rail, carrying a belt 77 formed of rubber or the like and which is arranged to engage within the grooves of the pulleys 44. The belt 77 engages the top of the pulley 44 while the belt 57 engages the top of the pulley 44 at the upper runs of the endless sprocket chains. The belt 77 will therefore turn the pulley 44 and its roll 27 counter-clockwise as it travels with the lower runs of the sprocket chains. The pressure rail 76 is mounted for vertical adjustment and is moved downwardly by levers 78, pivoted at 79 and swung downwardly by retractile coil springs 80. On the opposite side of the machine the numeral 81 designates a vertically movable pressure rail arranged above the hubs 47 of the pulleys 45, at the lower runs of the endless sprocket chains. The numeral 82 designates a stationary guide rail arranged to engage the lower sides of the pulleys 45. The pressure rail 81 is mounted for vertical downward movement and is moved downwardly by levers 84, in turn moved downwardly by springs 85.

A horizontally arranged topping or cutting mechanism 86 is disposed upon the forward or outlet side of the sprocket wheels 24, in close relation to the pairs of rolls, to cut the tops from the bulbs. This cutting mechanism includes a set of stationary blades 87 and a coacting set of reciprocatory blades 88, carried by a bar 89, suitably guided on the main frame. This bar is pivotally connected with a line 90, pivoted to a crank 91 carried by a rock-sleeve 92, suitably mounted for turning movement upon the main frame.

Disposed near and in advance of the cutting mechanism 86 is a stripping comb 93, carried by a reciprocatory bar 94 operating within a sta-

tionary guide 95. The comb has tapered tines 96, which are slightly vertically inclined rearwardly. The comb covers the cutting mechanism 86 and the bulb of the vegetable passes over the comb while the tops pass between the tines of the comb to be brought into engagement with the cutting mechanism and severed thereby. In order that there may be no tendency for the bulbs to remain attached to the comb the comb is reciprocated. The bar 94 of the comb is connected at one end with a retractile coil spring 97 while its opposite end is pivoted with a bell-crank lever 98, in turn pivotally connected with a crank 99 carried by the rock-sleeve 92.

The rock sleeve 92 has a crank 100 rigidly secured thereto and this crank has a head 101 provided with an elongated slot 102 for receiving a pin 103, carried by a coupling 104 which is pivotally connected with a connecting rod 105 by means of a horizontal pin 106. The connecting rod 105 is secured to a head 107, pivotally mounted upon a crank 108 carried by a transverse drive shaft 109. This drive shaft is journaled in bearings 110. The drive shaft 109 is driven by a grooved pulley 111 in turn driven by a belt 112. The drive shaft 109 carries a smaller grooved pulley 113, engaged by a belt 114 driving a larger grooved pulley 115, rigidly mounted upon a transverse shaft 116. This transverse shaft is journaled in bearings 117. Rigidly mounted upon the shaft 116 to rotate therewith are two smaller grooved pulleys 118, engaged by belts 119, engaging larger grooved pulleys 120, which are rigidly mounted upon the transverse shaft 22.

When the pairs of rolls 27 and 28 pass about the sprocket wheels 24, the adjacent rolls of different pairs become further spread, and there is a tendency for the smaller vegetables to fall through the spaces between such rolls. An important feature of the invention is the provision of means to prevent this. This means comprises generally U-shaped rods 121, including horizontal portions 122 and radial portions 123. The rods are arranged between the sprocket wheels 24 and the radial portions 123 are rigidly attached to the sprocket wheels. These rods 121 are so spaced circumferentially that they will pass between the spaces between the rolls of different pairs, and these rods terminate at substantially the circumference of the rolls.

The numeral 124 designates a transverse rake, including a group of hooks or tines 125, mounted upon a transverse rail 126. These tines are arranged adjacent to the forward inclined portion of the endless belt including the pairs of rolls, and serve to rake back down this forward inclined portion, the vegetables whose tops are not caught between the pairs of rolls.

The numeral 127 designates an inlet chute arranged at the intake end of the machine and 128 designates an outlet chute at the discharge end of the machine.

The operation of the machine is as follows:

The pulley 111 is driven counter-clockwise and the sprocket wheels 21 and 24 are driven counter-clockwise so that the upper run of the endless belt including the pairs of rolls travel to the left, Figure 4. The vegetables, such as onions, beets, turnips, carrots, or the like, are introduced into the chute 127 and fed thereby upon the intake end of the endless belt. The grooved pulleys 44 connected with the rolls 27 at the upper run of the endless conveyor are now engaging the belt 57, and hence all of the rolls 27 are turning clockwise, while the rolls 45 are engaging the belt 73 beneath them and are hence turning counter-clockwise. The rolls in each pair are therefore turning inwardly in opposite directions and serve to draw the tops of the vegetables downwardly between them. The adjacent rolls of different pairs are rotating in opposite directions upwardly. The vegetables are therefore carried by the endless belt and the tops of the vegetables are being drawn down between the rolls in each pair. When the forward inclined portion of the endless belt is reached, the vegetables whose tops have not worked down between each pair of rolls are raked down the inclined portion by the rake 124. The rods 121 now enter the spaces between the rolls of different pairs, as the pairs of rolls approach the sprocket wheels 124, thus preventing small vegetables from dropping through these spaces. As each pair of rolls approaches the comb 96 the bulbs of the vegetables pass upon the outer side of the comb and the bulbs clear the cutting mechanism 86, while the tops are severed. When each pair of rolls reaches the lower run of the endless belt the pulleys 44 engage at their tops with the belt 76 while the pulleys 45 engage at their bottoms with the belt 82. The roll 27 is now turning counter-clockwise and the roll 28 clockwise whereby the rolls in each pair turn in opposite directions in a downward direction with respect to their inner adjacent faces and this serves to work the tops downwardly and discharge the same from between the pair of rolls. The movable blade of the cutting mechanism is reciprocated by the connecting rod 93 and associated elements and the comb 96 is also reciprocated by the connecting rod 93 and associated elements.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, what I claim is:

1. In a vegetable topping machine, a frame, pairs of sprocket wheels mounted upon the frame, endless sprocket chains engaging the sprocket wheels, means to drive certain of the sprocket wheels, transverse pairs of loop-carriers mounted upon the sprocket chains, a pair of rolls associated with each pair of loop-carriers, a shaft carrying one roll and extending into the loop-carriers, adjustable bolts mounted upon the loop-carriers and engaging the shaft to adjust it longitudinally of the loop-carriers, adjustable means to draw the sides of the loop-carriers inwardly, a shaft carrying the other roll of the pair, eyes mounted upon the loop-carrier and receiving the second named shaft, means to turn the rolls in each pair inwardly and downwardly when they are at the upper run of the sprocket chains, means to turn the rolls in each pair inwardly and downwardly when they are at the lower run of the sprocket chains, and topping mechanism associated with the pairs of rolls.

2. In a vegetable topping machine, a frame, an endless belt mounted upon the frame comprising pairs of rolls, means to drive the endless belt, a set of grooved pulleys diposed near one side of the frame and connected with the corresponding rolls in said pairs and having hubs, a vertically movable upper pressure rail mounted near and above the grooved pulleys when the grooved pulleys are at the upper run of the endless belt, a flexible belt mounted upon the upper pressure rail and ar-

ranged to engage the tops of the grooved pulleys, the flexible belt extending beyond the forward end of the pressure rail, a stationary upper guide rail arranged near and beneath the hubs when the grooved pulleys are at said upper run to engage the bottoms of the hubs, means to move the pressure rail downwardly toward the guide rail, resilient means to exert a longitudinal pull upon the flexible belt extension, a lower vertically movable pressure rail mounted near and above the grooved pulleys when the grooved pulleys are at the lower run of the endless belt, a flexible belt secured to the lower movable pressure rail to engage with the tops of the grooved pulleys when they are at said lower run, a lower stationary guide rail arranged near and beneath the lower pressure rail and disposed to engage the bottoms of the hubs when the grooved pulleys are at said lower run, resilient means to move the lower pressure rail toward the lower guide rail, a second set of grooved pulleys disposed near the opposite side of the frame and connected with the other rolls in said pair and having hubs, an upper stationary guide rail disposed near and below the second set of grooved pulleys when they are at the upper run, a segment secured to the forward end of the last named upper stationary guide rail, a flexible belt carried by the last named upper stationary guide rail and segment and arranged to engage the bottoms of the second set of grooved pulleys when they are at said upper run, a vertically movable pressure rail disposed near and above the last named upper guide rail and arranged to engage the tops of the hubs of the second set of grooved pulleys when the grooved pulleys are at said upper run, resilient means to move the last named upper pressure rail downwardly toward the last named upper guide rail, a lower stationary guide rail disposed near and beneath the second set of grooved pulleys when they are at said lower run, a flexible belt carried by the last named lower stationary guide rail and disposed to engage the bottoms of the second set of grooved pulleys when they are at the lower run, a lower pressure rail arranged near and above the last named lower guide rail and disposed to engage the tops of the hubs of the second named set of grooved pulleys when such grooved pulleys are at said lower run, resilient means to move the last named lower pressure rail downwardly toward the last named lower guide rail, and cutting mechanism arranged near the discharge end of the endless belt.

3. In a vegetable topping machine, a frame, an endless belt mounted upon the frame comprising pairs of rolls, means to drive the endless belt, a set of pulleys disposed near one side of the frame and connected with the corresponding rolls in said pairs and having hubs, an upper pressure rail mounted near and above the pulleys when they are at the upper run of the endless belt, a compressible belt mounted upon the pressure rail and arranged to engage the tops of the pulleys, an upper guide rail arranged near and beneath the hubs when the pulleys are at said upper run to engage the bottoms of the hubs, yielding means to effect a relative closing movement between the pressure rail and guide rail, a lower pressure rail mounted near and above the pulleys when they are at the lower run of the endless belt, a compressible belt secured to the lower pressure rail to engage the tops of the pulleys when they are at said lower run, a lower guide rail arranged near and beneath the lower pressure rail and disposed to engage the bottoms of the hubs when the pulleys are at said lower run, means to effect a relative closing movement between the lower pressure rail and lower guide rail, a second set of pulleys disposed near the opposite side of the frame and connected with the other rolls in said pair and having hubs, an upper guide rail disposed near and below the second set of grooved pulleys when they are at the upper run, a compressible belt carried by the last named upper guide rail and arranged to engage the bottoms of the second set of grooved pulleys when they are at said upper run, an upper pressure rail disposed near and above the last named upper guide rail and arranged to engage the tops of the hubs of the second set of pulleys when they are at said upper run, yielding means to effect a relative closing movement between the last named upper pressure rail and last named upper guide rail, a lower guide rail disposed near and beneath the second set of pulleys when they are at said lower run, a compressible belt carried by the last named guide rail and disposed to engage the bottoms of the second set of grooved pulleys when they are at the lower run, a lower pressure rail arranged near and above the last named lower guide rail and disposed to engage the tops of the hubs of the second named set of pulleys when such pulleys are at said lower run, means to effect a relative closing movement between the last named lower pressure rail and the last named lower guide rail, and cutting mechanism arranged near the discharge end of the endless belt.

4. In a vegetable topping machine, a frame, pairs of sprocket wheels mounted upon the frame, endless sprocket chains engaging the sprocket wheels, means to drive certain of the sprocket wheels, transverse pairs of carriers mounted upon the sprocket chains, a pair of rolls mounted upon each pair of carriers, means to effect a relative closing movement between the rolls in each pair, means to turn the rolls in each pair inwardly and downwardly when they are at the upper run of the sprocket chains, means to turn the rolls in each pair inwardly and downwardly when they are at the lower run of the sprocket chains, guards secured to the sprocket wheels at the discharge end of the endless sprocket chains and extending radially beyond such sprocket wheels to enter the spaces between the carriers and rolls of different pairs, and topping mechanism associated with the rolls.

5. In a vegetable topping machine, a frame, pairs of sprocket wheels mounted upon the frame, endless sprocket chains engaging the sprocket wheels, means to drive certain of the sprocket wheels, transverse pairs of carriers mounted upon the sprocket chains, a pair of rolls mounted upon each pair of carriers, means to turn the rolls in each pair inwardly and downwardly when they are at the upper run of the sprocket chains, means to turn the rolls in each pair inwardly and downwardly when they are at the lower run of the sprocket chains, guards secured to the sprocket wheels at the discharge end of the endless sprocket chains and extending radially beyond such sprocket wheels, said guards being disposed to enter the spaces between the adjacent rolls of different pairs, and topping mechanism associated with the rolls.

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