Oct. 30, 1934. J. G. GAVLAK 1,978,838

CLEANING AND POLISHING MACHINE

Filed Jan. 31, 1933

Fig. 1

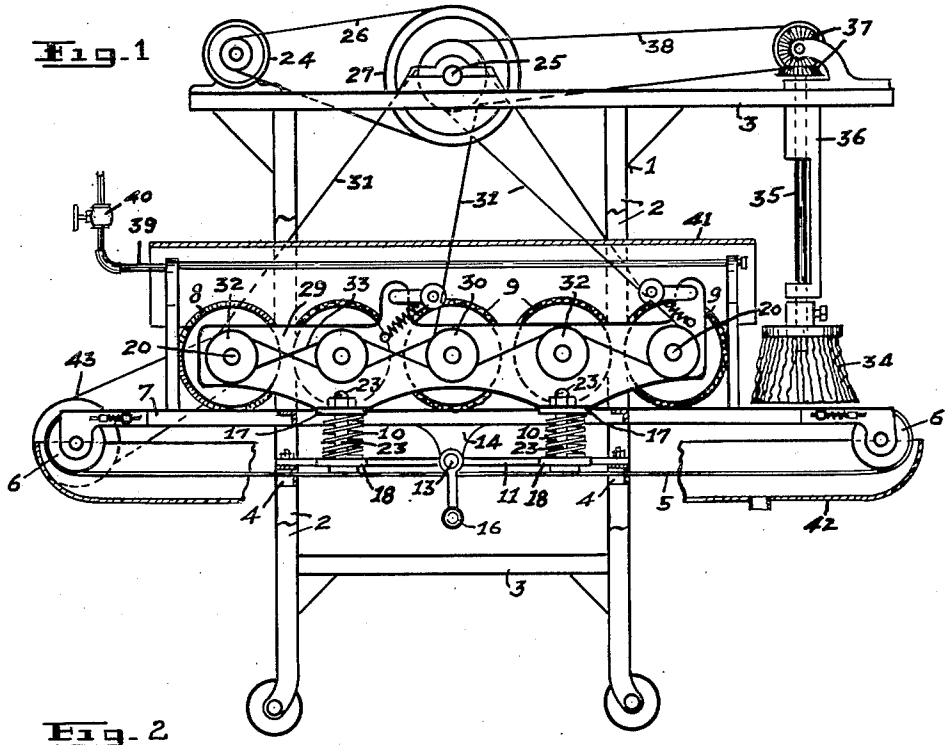


Fig. 2

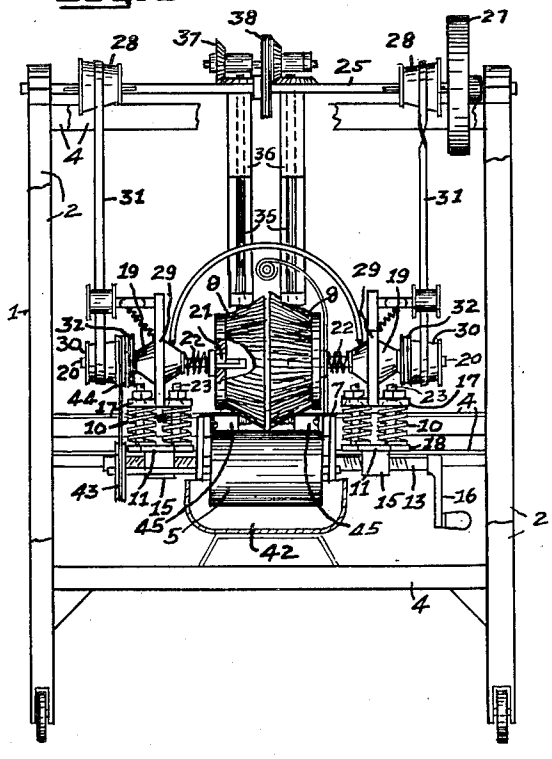
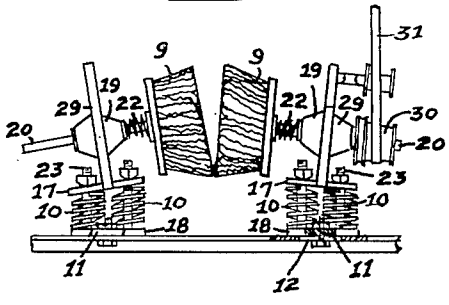


Fig. 3



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CLEANING AND POLISHING MACHINE

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1 Claim. (Cl. 146—202)

My invention relates to a cleaning and polishing machine, and while primarily intended for cleaning and polishing fruit and vegetables, particularly tomatoes, it will be obvious that the device may be employed for any other purposes wherein it is found to be applicable.

Important objects of the invention are to provide a simple and effective apparatus of the character described, which will thoroughly clean and polish vegetables and fruits without damaging said produce, which is power operated for automatically conveying, cleaning and polishing the produce, which is adjustable to render same adaptable to vegetables of varying sizes, and which is comparatively inexpensive to manufacture and operate.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of the novel construction, combination and arrangement of parts herein specifically described and illustrated in the accompanying drawing, but it is to be understood that changes in the form, proportions and details of construction may be resorted to that come within the scope of the claim hereunto appended.

In the drawing wherein like numerals of reference designate corresponding parts throughout the several views:

Figure 1 is a side elevational view of a cleaning and polishing machine constructed in accordance with the invention, with portions thereof in cross section and broken away.

Figure 2 is a front view of the device with portions thereof broken away and with other portions in cross section.

Figure 3 is a front view of a pair of associated cleaning elements illustrating the angular adjustment of the latter.

Referring in detail to the drawing 1 denotes a substantially rectangularly-shaped supporting frame, comprising four vertical legs 2, the longitudinally extending members 3 and the transversely disposed members 4, all of which are fixedly secured together and suitably braced to provide a rigid frame structure. The legs 2 are provided with wheels to facilitate the transportation of the device when required.

A tensioned, horizontally disposed belt conveyor 5, traveling on a pair of rollers 6 resiliently mounted at respective ends of a conveyer support 7, extends longitudinally through the vertical center of the frame, and has its end portions projecting beyond the ends of the latter. The conveyer support 7 is fixed in position to the transverse frame members 4 of the frame, in any suitable manner.

A pair of bearing bars 29 is provided for carrying a plurality of vertically disposed, circular cleaning brushes, respectively indicated at 8 and 9. The bearing bars 29 are spaced in opposed relation to each other and extend longitudinally and above but adjacent to respective sides of the conveyer 5.

Each of the bearing bars 29 is supported upon two pairs of spiral springs 10, which rest upon respective seating plates 11. The seating plates 11 are shiftably mounted, as at 12, on transverse frame members 4, and are laterally adjustable on the latter, by a screw shaft 13, which is journaled in a bearing 14 carried by the conveyer support 7. The screw shaft 13 is formed with right and left hand screw threads and engages in correspondingly threaded lugs 15 carried by respective seating plates 11. The screw shaft 13 is provided with a handle 16 to facilitate its operation in adjusting the bearing bars 29 to shift toward or from each other.

The bearing bars 29 and the seating plates 11 are provided with laterally disposed flanges, respectively indicated at 17 and 18, for seating the springs 10. The springs 10 are maintained in position by bolts 23, which extend vertically through the former and through the flanges 17 and 18.

Each of the bearing bars 29 is provided with a plurality of longitudinally aligned bearings 19, in each of which a brush shaft 20 is suitably journaled for rotation. The bearings 19 of one of the bars 29 are transversely aligned with the corresponding bearing of the other of said bars. The vertical brushes 8 and 9 are keyed to inner ends of respective brush shafts 20, as indicated at 21, to rotate with the latter. The brushes 8 and 9 are also longitudinally shiftable on the shafts 20. Spiral springs 22 are mounted on the latter between the bearings 19 and the brushes 8 and 9 to normally force said brushes inwardly on their shafts 20.

The brushes 8 and 9 differ from each other only in that the former are provided with soft bristles for cleaning elements, while the latter employ cloth and the like for cleaning elements. The first associated pair of vertical brushes are preferably of the type employing bristle cleaning elements, and the others are preferably of the type employing cleaning elements constructed from cloth. However, it is evident that this arrangement of brushes and the number of the

latter employed may be varied to best meet conditions found in practice.

It will here be noted that the vertical brushes 8 and 9 are arranged to function in pairs, which are in opposed relation to each other directly over and in close proximity to the top of the conveyer 5.

The vertical brushes 8 and 9 may be elevated or lowered by the adjustment of the spring bolts 22, or the spaced relation of the associated pairs of said brushes may be varied by the adjustment of the seating plates 11 upon the transverse frame members 4 by the adjustment of the screw shaft 13. Further, the associated pairs of vertical brushes may be shifted to angular positions relatively to each other, as clearly illustrated in Figure 3, by varying the adjustment of the spring bolts 23.

My improved apparatus is preferably driven by a variable speed motor 24 and the transversely extending drive shaft 25, which are suitably mounted on the frame 1 and connected by a belt 26. The latter travels on a large pulley 27 fixed on the drive shaft 25. A pair of cone-shaped pulleys 28 are keyed on the drive shaft 25 to turn with but allow longitudinal movement on the latter.

One brush shaft 20 on each of the bearing bars 29 carries a fixed cone-shaped pulley 30, which are connected to respective cone-shaped pulleys 28 on the drive shaft 25 by belts 31. The construction and arrangement of the cone-shaped pulleys 28 and 30 will permit suitable compensating adjustments to the belts 31, regardless of the angular or other adjustments of the vertical brushes 8 and 9 and associated parts.

The brush shafts 20 are provided with pulleys 32, which are suitably interconnected by belts 33 and suitably mounted idler pulleys to impart simultaneous and uniform rotation to all of the vertical brushes 8 and 9.

The arrangement and operation of the entire driving mechanism employed in connection with the device is preferably such that the associated pair of brushes 8 rotate in the same direction, while the brushes 9 of all of the other of said pairs rotate in opposite directions relatively to each other.

A pair of horizontally disposed polishing brushes 34, of any suitable construction, are carried by the vertical shafts 35 and disposed rearwardly of the rear pair of opposed vertical brushes 9. The shafts 35 are mounted for rotation in bearing members 36, which are fixed to the frame 1. The shafts 35 are provided with suitable gears 37 to revolve the polishing brushes 34 in opposite directions with respect to each other. The gears 37 are operated by a pulley and belt connection with the drive shaft 25, as indicated at 38, in Figure 2.

A water drip pipe 39 is suitably supported in the frame 1, and extends longitudinally directly above and centrally of the pairs of vertical brushes 8 and 9. The drip pipe 39 is controlled by a valve 40, and provided for supplying a suitable quantity of water during the cleaning operation to be described.

A splash hood 41, resting on the bearings 19 or otherwise supported in the frame 1, is positioned over the vertical brushes 8 and 9 and provided for the purpose of confining the splashing of any water during the cleaning operation. A drain pan 42 is mounted in the frame 1 beneath the conveyer 5 for collecting the water after passing from the brushes during the cleaning operation.

The conveyer 5 is driven by a belt connection 43, which joins the former with a pulley 44 on one of the brush shafts 20. The conveyer travels in a direction to convey the vegetables thereon from the forward to the rearward end thereof. The vegetables may be fed to the conveyer 5 from a suitable storage hopper or placed thereon in any suitable manner. Upon leaving the rear end of the conveyer 5, the vegetables may be passed onto a gravity or power operated grading appliance, or deposited in any provided receptacle.

A pair of resilient guide fingers 45 secured to the conveyer support 7, are positioned forwardly of each pair of associated brushes for the purpose of directing the vegetables between the latter while travelling rearwardly on the conveyer 5 during the cleaning operation.

The mounting of the bearing bars 29 upon the springs 10 and the provision of the individual brush springs 22, in the manner stated, will provide a resilient, vibratory motion to the brushes 8 and 9, which while rotating will function to impart a tumbling, buffeting action to the vegetables throughout the passage of the latter between the various pairs of brushes.

If the vegetables are not soiled no water need be employed, in which case the device would serve merely to polish the produce.

The horizontal pair of brushes 34 are particularly adapted for effecting the polishing operation, but it is apparent that the other pairs of brushes will likewise serve as polishing elements if no water is employed to provide a washing operation.

The present invention provides a most effective apparatus for cleaning and polishing tomatoes or any other vegetables or fruits that have a comparatively spherical contour. In the use of my improved machine, the produce is rapidly cleaned and polished without the slightest damage thereto, and the usual arduous labor involved in the manual cleaning and polishing of produce in the usual manner is entirely eliminated.

What I claim is:

In combination, a cleaning apparatus of the character described comprising, a frame structure, a continuous horizontally belt conveyer supported in said frame structure, a pair of seating plates mounted in said frame structure and laterally adjustable on the latter, a pair of bearing bars extending along respective sides of said conveyer, a plurality of circular brushes carried by each of said pair of bearing bars and disposed above said conveyer, a plurality of spiral springs mounted on each of said pair of seating plates and supporting respective bearing bars, means for adjusting said springs for varying the angular disposition of respective bearing bars and the brushes carried by the latter, and means for driving said conveyer and for revolving said brushes.

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