

Jan. 16, 1940.

N. H. SCHNEIDER

2,187,101

GRADER

Filed Nov. 22, 1937

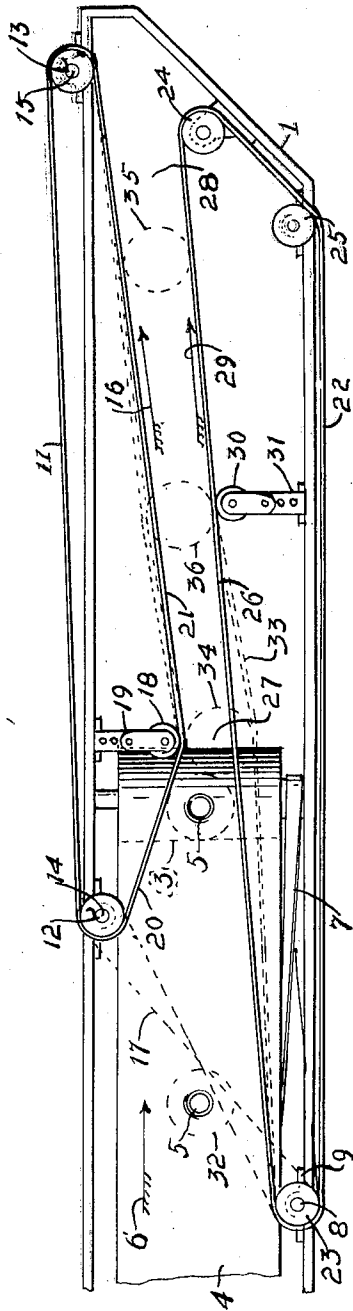


FIGURE 1

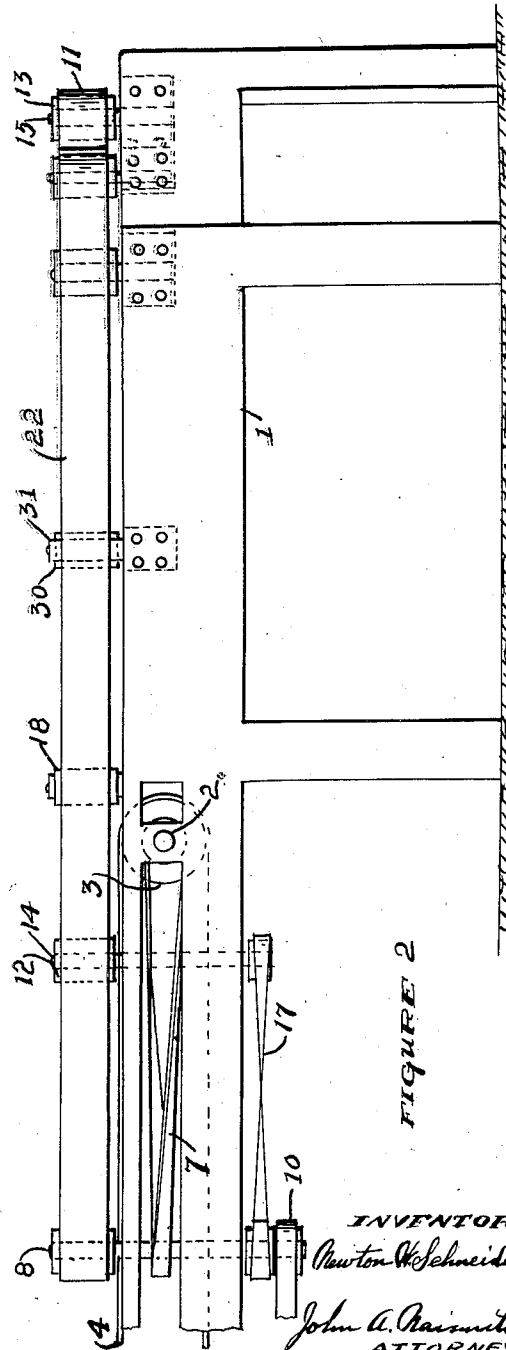


FIGURE 2

INVENTOR

Newton H. Schneider

John A. Rasmith
ATTORNEY

UNITED STATES PATENT OFFICE

2,187,101

GRADER

Newton H. Schneider, Salinas, Calif.

Application November 22, 1937, Serial No. 175,814

4 Claims. (Cl. 209-102)

The present invention relates particularly to a machine for grading items such as lettuce, tomatoes, and all items susceptible to bruising, according to size without injury thereto, and with desired speed.

It is also an object of the invention to provide a machine of the character indicated that will be economical to manufacture, simple in form and construction, positive in operation, and highly efficient in its practical application.

This application is a continuation-in-part of my application bearing Serial No. 65,801, filed February 26, 1936.

In the drawing:

Figure 1 is a plan view of a structure embodying my invention, partly broken away.

Figure 2 is a side elevation of the structure shown in Figure 1.

In the device as herein illustrated I show at 1 a frame in which is journaled as at 2 a roller 3 carrying a belt 4. In the present instance the belt 4 is an endless belt provided with spaced pockets as 5 disposed along its median line as shown, the items to be graded, such as heads of lettuce, being arranged in these pockets and carried in the direction indicated by arrow 6 in definite spaced relationship to each other.

The roller 3 is driven by a belt connection 7 to a drive shaft 8 journaled in frame 1 as at 9 and vertically disposed relative to the plane of the belt, a portion only of the shaft drive being indicated at 10.

The belt or conveyor 4 with its cooperating parts as described comprises the feeding means to the grader belts 11 and 12.

The grader belt 11 is mounted on pulleys as 12 and 13 on vertical shafts 14 and 15 on frame 1, consequently the plane of the belt is at right angles to that of belt 4, but it travels in the same direction as belt 4 as indicated by arrow 16, and in substantially parallel relation thereto. This movement of the belt is effected by means of a crossed belt connection 17 from the drive shaft 8 to shaft 14.

The pulley 13 is disposed some distance beyond the discharge end of belt 4 and is offset laterally with respect to said belt, and the pulley 12 is disposed at the side of the belt and is spaced back a distance from its discharge end.

At 18 is shown a roller adjustably mounted as at 19 on frame 1 and bearing against the inner side of belt 11 at a point adjacent the discharge end of belt 4, and is operative to support belt 11 at this point in spaced relation to the vertical median plane of belt 4.

The arrangement of belt 11 as described is such that a short portion 20 is provided that is forwardly and inwardly inclined toward the center line of belt 4, and a longer portion 21 is inclined forwardly and outwardly as shown.

The grader belt 22 is mounted on pulleys 23, 24, 25 on vertical shafts on frame 1, the inner portion of the belt, 26, extending in a straight line from the pulley 23 to the pulley 24 and disposed in opposed relation to the portions 20 and 21 of belt 11.

The pulleys 23 and 24 are so positioned that the belt portion 26 overlies belt 4 in opposed relation to belt portion 20, approaches closest to the belt 11 at 27 opposite roller 18, and then forms a gradually widening passage 28 with the belt portion 21.

The belt 22 is driven in the direction indicated by arrow 29 by means of a belt connection on pulley 23 on shaft 8, the two belts 11 and 22 being driven at the same rate of speed in the same direction.

At 30 is shown a roller adjustably mounted on a bracket 31 on frame 1 immediately back of the portion 26 of belt 22 at a point some distance forward of the discharge end of belt 4.

When the grader is in operation it may be assumed that an item, indicated by the dotted circle at 32, is moved forwardly in a straight line by the belt 4 until it contacts the opposing portions of the belts 11 and 22. Since these belts converge to the point 27 they pick the item up and cooperate in carrying it past the discharge end of belt 4.

Since the belt portion 26 is unsupported opposite the roller 18 it gives way as indicated in dotted lines at 33, the item 32 taking the position indicated at 34. The two belts being operated at the same rate of speed the item is carried on without friction to some such position as 35 where the passage 28 is sufficiently wide to permit it to drop down.

It is clear that with the belt portion 20 free to give way throughout its entire length, a second item of large size cannot be introduced to the passage 27 because it will spread the opposing belt portions apart and cause the item to drop before it reaches the position 35. Consequently the spacing of the items on belt 4 would have to be equal to, or greater, than the distance between the positions 34 and 35.

In order to permit the closer spacing of the items on belt 4, and consequently to move a larger number of items through the grader in a given time, the roller 30 may be moved up to

contact the belt portion 20. Since the belt portion 21 is unsupported opposite the roller 30 it follows that it will be depressed by the passing item as at 36, but will immediately assume its original position when the item has passed the roller 30. In the meantime another item may enter the diverging passage 28 through 27. Of course, a roller as 30 may not be used, or one may be used, or any desired number may be disposed in staggered relation down long belts and the items transported and dropped where desired.

It is to be understood, of course, that while I have herein shown and described but one specific example of the invention, changes in form, construction, and method of assembly and operation, may be made within the scope of the appended claims.

I claim:

1. A grader comprising, a conveyor having a discharge end, opposed belts mounted to travel about vertical axes and overlying the conveyor in part and extending beyond the same and movable in the same direction, said opposed belts converging over the conveyor to a point adjacent the discharge end thereof and then diverging therefrom, and instrumentalities resiliently supporting the extreme convergent portions of the belts in separable relation to each other to permit passage of items of varying size therebetween.

2. A grader comprising, an item conveyor, and a pair of opposed belts mounted thereover to travel about vertical axes and in the same direction and extending beyond the discharge end thereof and adjacent thereto, one of said belts being straight and yieldable, and the opposing

portion of the other belt having an unyielding portion adjacent thereto at a point adjacent the discharge end of the conveyor and diverging in both directions therefrom.

3. A grader comprising, an item conveyor, a straight belt mounted to travel in a vertical plane and in part overlying the conveyor and extending beyond the discharge end thereof and angularly disposed relative to the median line of the conveyor to intersect an extension of said median line beyond the discharge end of the conveyor, and a second belt disposed in opposed relation to the first belt and having a portion thereof unyieldingly supported in spaced relation to the first belt at a point adjacent the discharge end of the conveyor and diverging in both directions therefrom, and instrumentalities for actuating the two belts in the same direction at uniform speeds.

4. A grader comprising, a conveyor belt provided with spaced item supporting means disposed along its median line, and a pair of opposed belts mounted immediately over the conveyor to travel about vertical axes in the same direction and extending beyond the discharge end thereof, one of said belts being straight and yieldable, and the opposing portion of the other belt having an unyielding portion adjacent thereto at a point adjacent the discharge end of the conveyor and diverging both rearwardly and forwardly therefrom, the forwardly diverging portions of said belts having staggered supported and unsupported portions to form grading passages of substantially the same length as the spaces between the item supporting means.

NEWTON H. SCHNEIDER.