Aug. 29, 1944. S. P. PESZNECKER 2,356,945

VEGETABLE AND FRUIT GRADERS

Filed March 18, 1942 2 Sheets-Sheet 1

Fig 1

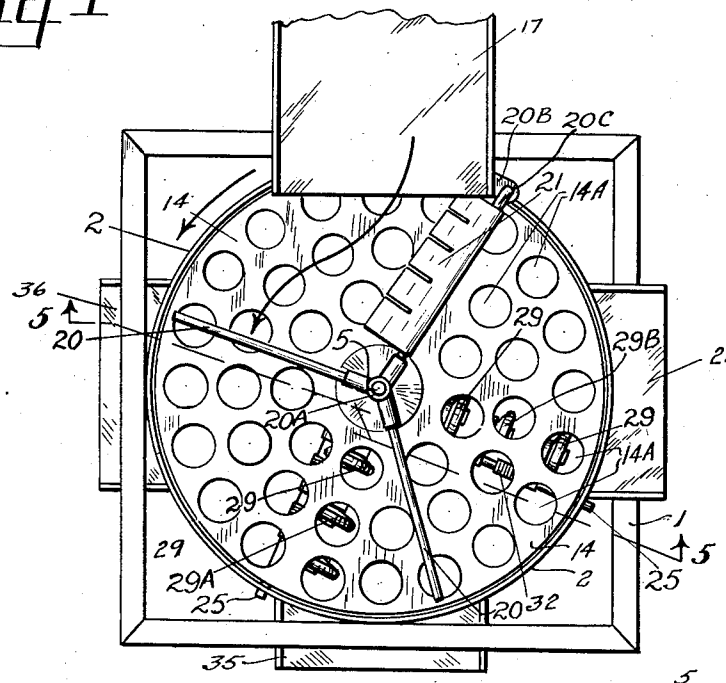
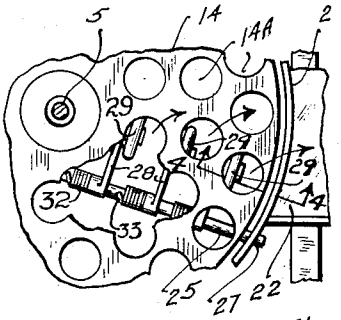


Fig 3



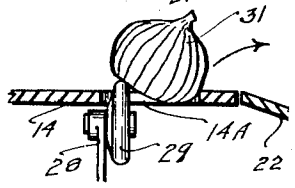


Fig 4

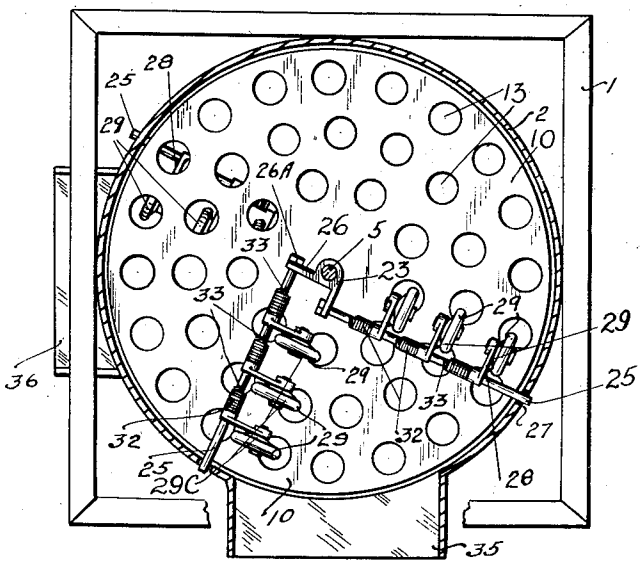


Fig 2

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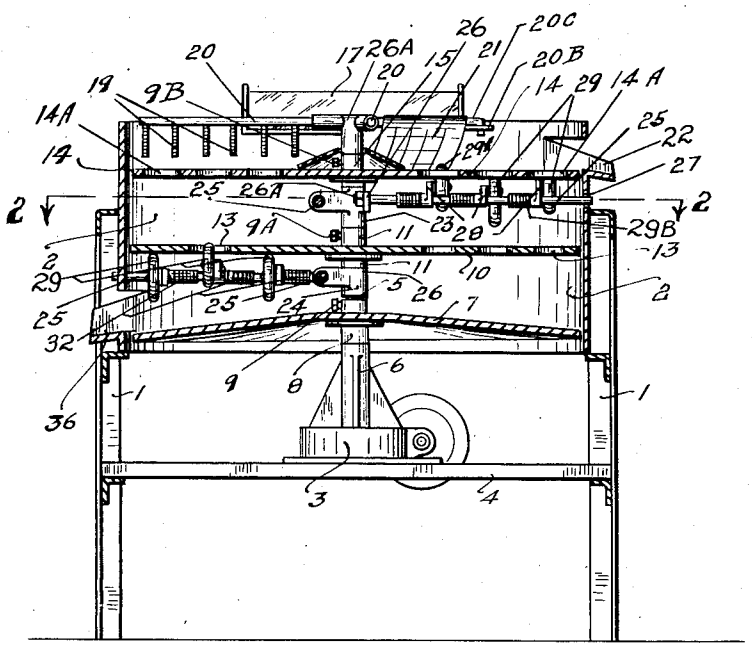
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Aug. 29, 1944. S. P. PESZNECKER 2,356,945

VEGETABLE AND FRUIT GRADERS

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Fig 5



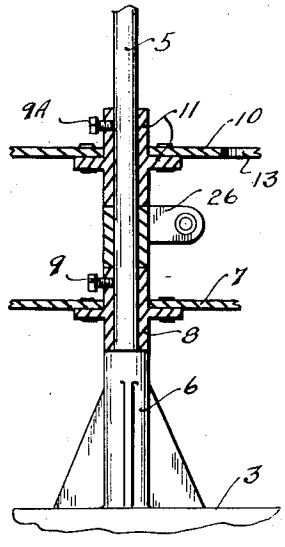


Fig 6

Fig 7

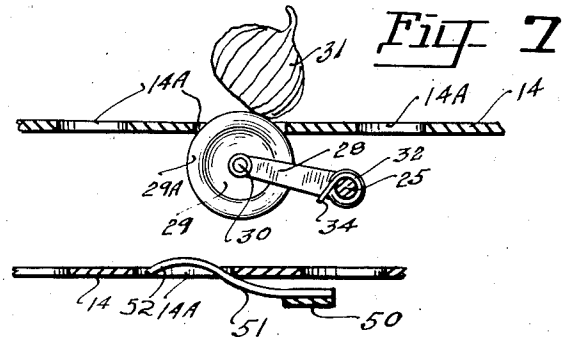


Fig 8

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Patented Aug. 29, 1944

2,356,945

UNITED STATES PATENT OFFICE

2,356,945

VEGETABLE AND FRUIT GRADER

Stephen P. Pesznecker, Portland, Oreg.

Application March 18, 1942, Serial No. 435,181

2 Claims. (Cl. 209—87)

This invention relates to vegetable and fruit graders, and is particularly adapted for the grading of onions.

The primary object of my invention is to provide a grader of this character having a series of perforated grading discs arranged, one above the other, within a circular casing; said discs having apertures therethrough of different sizes relative to each of the several grading discs.

Another object of my invention is to provide a driving element upon which the grading discs are mounted in such a manner as to permit the removal of the discs from the driving element for interchanging the same with other grading discs having different size grading apertures therethrough.

A still further object of my invention is to provide means to assist the product being graded to so position itself over the apertures as to readily pass through the same when the proper sized product matches the aperture for grading the same. This is accomplished by specially mounted resilient rollers frictionally engaging the underside of the grading discs raising up through the apertures for dislodging any product being graded that may be sticking in the apertures and that is small enough to pass through the apertures.

These and other incidental objects will be apparent in the drawings and specification.

Referring to the drawings:

Figure 1 is a top plan view of my new and improved vegetable and fruit grader.

Figure 2 is a sectional plan view, taken on the line 2—2 of Figure 5, looking in the direction indicated.

Figure 3 is a fragmentary plan view of the kick-out mechanism, with parts broken away for convenience of illustration.

Figure 4 is a fragmentary detail sectional view along the line 4—4 of Figure 3, and illustrates the principle of operation of the kick-out mechanism.

Figure 5 is sectional side view taken on the line 5—5 of Figure 1, looking in the direction indicated.

Figure 6 is a fragmentary detail sectional view illustrating the manner of mounting the grading discs on the driving element.

Figure 7 is an enlarged fragmentary sectional detail view illustrating the kick-out mechanism.

Figure 8 illustrates, in sectional side elevation, another method of removing the product from the apertures within the grading discs.

In the drawings:

Reference numeral 1 indicates a framework, having a cylindrical drum 2 mounted therein. A reduction gear 3 is mounted to a cross frame 4 and provides the driving unit for the grader. This driving unit supports the grading units thereabove and drives the same in the following manner.

A drive shaft 5 extends upwardly from the housing 6 of the unit 3. A circular conical disc 7, having a hub 8 located at its apex is fixedly mounted to the shaft 5 for rotation therewith and locked thereon by suitable fastening means, such as a set screw 9.

A perforated disc 10, having a hub 11, is fixedly mounted to the shaft by the set screws 9A. This disc has apertures 13 therein. A third disc 14 is mounted to the shaft 5, above the disc 10, by its hub 15 and set screw 9B; this disc also has apertures 14A therein. As the product to be graded is fed to the upper disc 14 out of the chute 17 and travels around with the disc, the smaller products will fall through the apertures 14A onto the perforated disc 10, where a second grading operation takes place whereby the smaller products will fall through the apertures 13 onto the solid disc 7. I do not wish to be limited to the number of separations, as there may be any number of perforated discs provided.

As the product travels around over the upper disc 14 it is agitated over the apertures 14A in order to assist in grading. This is accomplished by the downwardly extending flexible elements 19, which are mounted to the underside of the bars 20. The bars are fixed to the hub 20A and the hub is loosely mounted to the upper end of the shaft 5 and held from rotating by the bar 20C engaging a stop 20B. When the product travels under the bars 20 the flexible elements 19 turn the product over on the surface of the disc 14, causing the smaller products to pass down through the openings 14A. A flexible baffle 21 extends down from the bar 20C for directing the product around over the disc 14 in the direction of the arrow in Figure 1.

As the product travels around with the disc 10 and 14, further agitation of the product on the surface of the discs and apertures is required. To accomplish this I provide hubs 23 and 24 which are loosely mounted to the shaft 5 and do not revolve therewith. Horizontal shafts 25 are provided, having one of their ends fixedly mounted to the supporting arms 26 of the hubs 23 and 24 by lock nuts 26A, and their opposite ends mounted and supported in the openings 27 of the cylindrical drum 2.

Arms 28 are yieldingly and swingably mounted

to the shafts 25, and are provided with wheels 29 journaled to their outer ends at 30. The wheels register with the apertures 13 and 14A within the discs 10, and 14 respectively, as best illustrated in Figures 1 and 5. The wheels are forced against the underside of the discs 10 and 14 by springs 32, having one of their ends fastened securely to the shaft 25 at 33, and their opposite ends engaging the arm 28 at 34.

Referring to Figure 1, it will be noted that a group of kick-out wheels 29B are located adjacent the discharge chute 22, these wheels dislodge the product into the chute 22. Located in advance of the group of wheels 29B is another group 29C. The purpose of the group of wheels 29C is to turn the product over on the surface of the disc 14 so that the smaller product will pass down through the apertures 14A onto the disc 10. After the product passes down through the disc 14 the same operation takes place relative to the disc 10, providing a further separation of the product. The product that will not pass through the disc 10 is passed into the discharge chute 35. Any product that passes down through the disc 10 will be delivered upon the disc 7, and discharged by way of the chute 36. The chutes 22, 35 and 36 deliver the product into suitable sack receiving arrangements not here shown.

Referring to Figures 3 and 4, it will be noted that the kick-out wheels 29 are offset relative to the openings of the discs. The reason for this, as best shown in Figure 4, is to force the product 31 toward the chute 22, when it is raised from the openings 14A, to assist in discharging the same.

It has been found that centrifugal force of the rotating disc alone will not always discharge the product, and the offsetting of the kick-out wheels need only be adjacent the discharge chutes, as shown, for instance, by the group of kick-out wheels 29B. The group of wheels 29C do not have to be offset as they are only for the purpose of turning the product over on the surface of the disc. The group of rollers underneath the disc 10 are arranged similar to those just described adjacent the disc 14.

In Figure 8, the modified form of kick-out mechanism illustrated, comprises a supporting bar 50, equivalent to the shaft 25, located underneath the perforated discs. Mounted to this bar is a series of flexible shoes 51 riding against the under surface of the disc. When the shoe 51 engages the opening 14A, the spring tension thereof forces the point 52 of the shoe up through the opening dislodging the product thereabove.

The grading discs 10 and 14 may be readily removed from the driving shaft as follows: The hub 20A is first removed then the set screw 9B is loosened from the hubs 8 of the disc 14. The kick-out assemblies may next be removed by loosening the holding nuts 26A which permits the hub 23 to revolve slightly pulling the shaft 25 out of the openings 27 of the drum 2 allowing the assemblies to be removed. The simplicity of interchanging the grading discs is one of the important features of my invention.

I will now describe a cycle of operation of my new and improved vegetable and fruit grader. The product is fed into the machine by way of chute 17 and is carried around in the direction of the arrow by the disc 14, as it passes under the bars 20 the flexible downwardly extending elements 19 roll it about over the surface of the disc 14, causing the smaller of the product to pass through the apertures 14A. The product is further agitated and rolled about by the kick-out wheels 29C, and by the time it reaches the chute 22 the smaller products will have passed down through the apertures, the larger product that cannot pass through the apertures is dislodged by the kick-out wheels 29B, and due to the centrifugal action of the revolving discs, the larger product will roll into the chute 22. The products that have passed through the disc 14 will be again graded on the discs 10 through smaller apertures. The kick-out wheels agitating the same and also kicking the final product out through the chute 35. The smaller product that passes through the apertures 13 will then be delivered to the solid disc 7 and out through the chute 36.

I do not wish to be limited to the particular mechanical construction shown, as other forms of mechanical embodiment may be employed, still coming within the scope of the claims to follow.

I claim:

1. A machine for the purpose specified comprising in combination, a frame, a vertically disposed open ended drum carried by the upper end of said frame, a concentrically disposed driven shaft extending into said drum from the lower end thereof, vertically spaced apertured grading disks removably mounted on said shaft for rotation therewith within said drum, said disks substantially conforming to the interior diameter of the drum and the apertures of the upper disk being larger than those of the subsequent disk, material supply means for said upper disk, graded article discharge means carried by said drum at its side above said respective disks, radially extending arms removably and loosely journalled on said shaft below said disks, a plurality of yielding presser members carried by each of said arms and bearing against the bottom of the superjacent disk in alinement with apertures thereof whereby to dislodge articles sticking in said apertures, and drum-carried anchoring means detachably engaging the outer ends of said arms.

2. The combination set forth in claim 1 and a single bearing for said shaft carried by said frame below the lowermost disk whereby the disks can be removed by way of the upper end of the shaft without dismantling the same.

STEPHEN P. PESZNECKER.