C. A. BIGGS.

APPLE FEEDING DEVICE.

APPLICATION FILED MAR. 9, 1921.

1,388,916.

Patented Aug. 30, 1921.

2 SHEETS—SHEET 1.

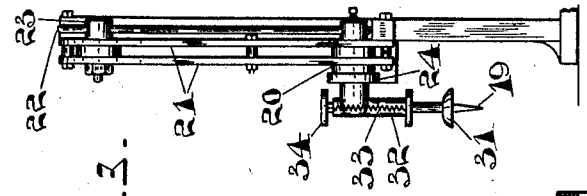

Fig. 2.

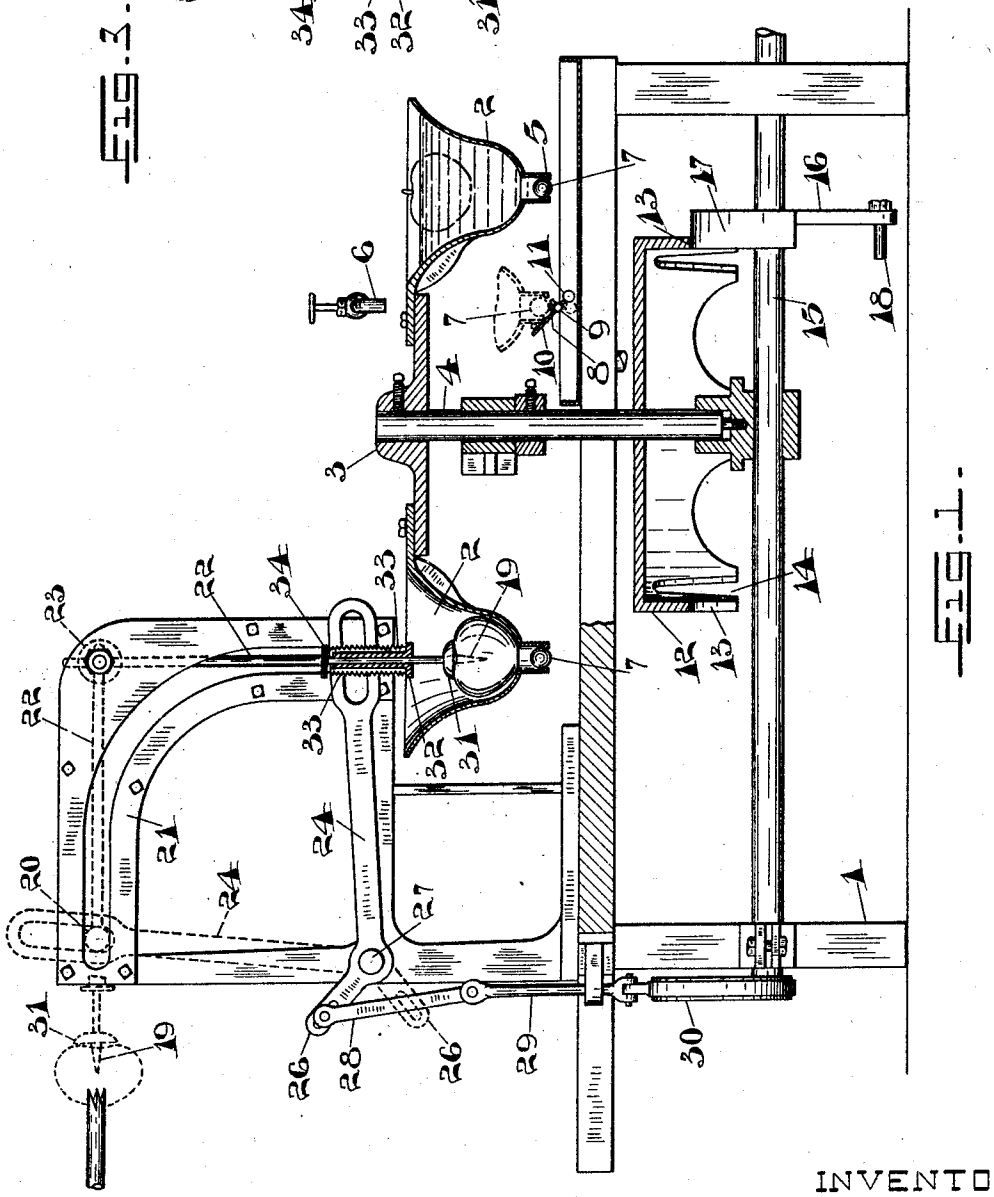

Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

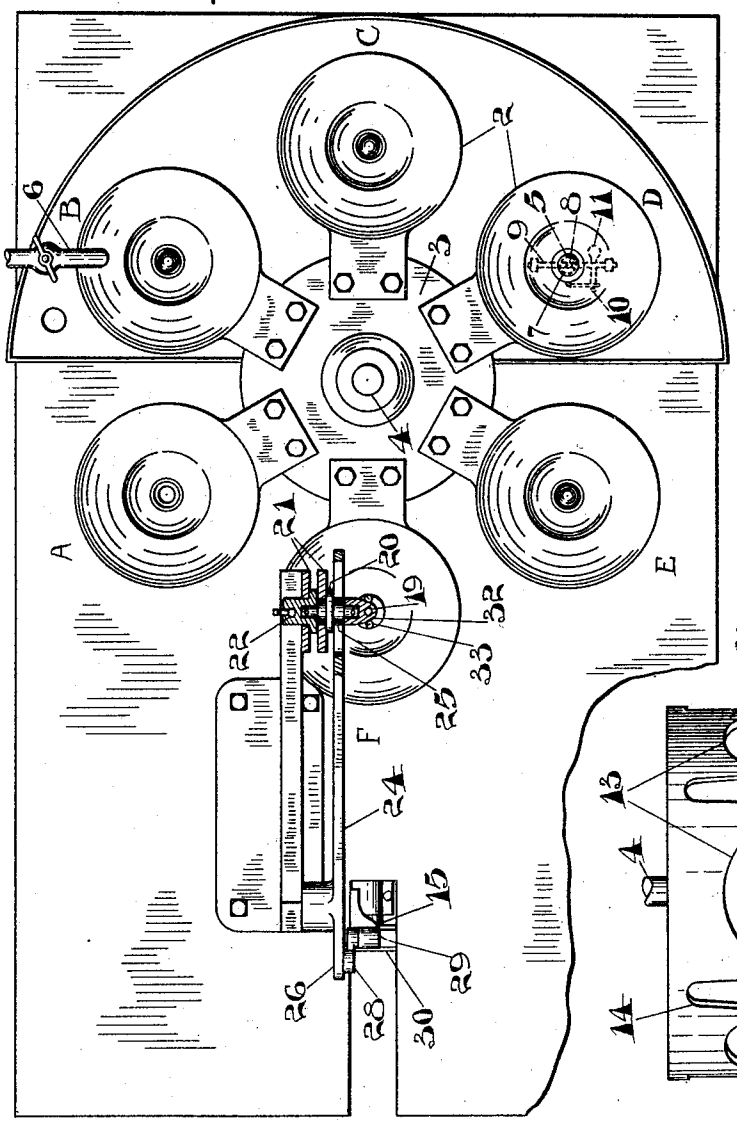


Fig. 4.

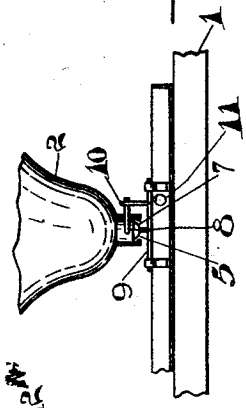
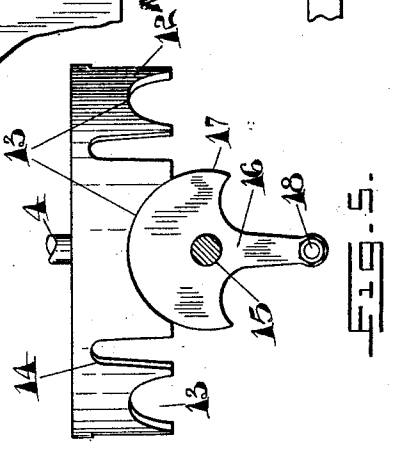


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES A. BIGGS, OF REGINA, SASKATCHEWAN, CANADA.

APPLE-FEEDING DEVICE.

1,388,916. Specification of Letters Patent. Patented Aug. 30, 1921.

Application filed March 9, 1921. Serial No. 451,024.

To all whom it may concern:

Be it known that I, CHARLES A. BIGGS, of the city of Regina, in the Province of Saskatchewan, Canada, a subject of the King of Great Britain, have invented certain new and useful Improvements in Apple-Feeding Devices, of which the following is a specification.

This invention relates to apparatus for feeding apples to the impaling prongs of a paring machine. It is known that apples floating in water tend to assume a position with the line joining the centers of the blossom and stem ends, in other words the core axis, substantially vertical, and feeding machines have been devised utilizing this method of positioning the apples for engagement with feeding devices.

Such machines have so far been somewhat complicated and expensive and do not properly impale the apple with the center line of the stem and blossom end in proper alinement with the axis of the prongs of the paring machine. My object therefore is to devise a simple inexpensive machine which will operate on any size of apple substantially without adjustment, and which will accurately impale each apple on the prongs of the paring machine.

I attain my object by means of the constructions hereinafter described and illustrated in the accompanying drawings in which—

Figure 1 is a side elevation, partly in section, of a machine constructed in accordance with my invention;

Fig. 2 a plan view of the same, partly in section;

Fig. 3 an end elevation of the feeder;

Fig. 4 an elevation, partly broken away, of part of a machine showing particularly the apparatus for emptying the positioning cups of liquid; and

Fig. 5 an end elevation of the Geneva gearing.

In the drawings like numerals of reference indicate corresponding parts in the different figures.

1 is the frame of a machine suitably shaped to support the different parts, On this frame a plurality of positioning cups 2 are supported so that they may be intermittently moved in a closed orbit. The preferred construction is to connect the cups to a carrier 3 provided with a vertical spindle 4 suitably journaled in the frame of the machine.

While any desired number of cups may be employed, I find that satisfactory results can be obtained with six as shown. Each of these cups is of the bell-shaped form shown, the bottom of the cup being approximately hemispherical. This arrangement, I find, permits the apples contained in the cups to turn freely to float with the core axis vertical and also accurately centers the apple in the cup, and these results are satisfactorily attained with apples differing somewhat widely in size.

To cause the positioning of the apples by flotation, it is necessary to provide means for temporarily filling each cup in turn with liquid and for emptying the cup after the apple has been suitably floated to its proper position. While various means might be employed to fill and empty the cups, I prefer to make the cups substantially imperforate save for a valve controlled aperture 5 at the bottom and to provide a suitable valve controlled conduit 6 for introducing liquid into each cup as the cup is brought to a suitable position.

To control the outlet 5 I prefer to employ a ball valve 7 engaging a suitable seat from above and adapted to be automatically lifted by suitable mechanism at the proper time. By the rotation of the carrier each cup in turn is brought to a suitable position to receive an apple. While apples might be placed by hand, an automatic carrier of any known type will usually be employed to feed an apple to each cup as it reaches the position A as indicated in Fig. 2.

After receiving an apple, the cup moves to the position B, where it passes under the outlet of the conduit 6 and is filled with water, the water flowing down the side of the cup where it is most effective in turning the apple in the cup if it does not happen to have dropped in proper position.

The cup next moves to the position C, in which the flotational effect is allowed sufficient time to operate to float the apple with the core axis vertically.

On reaching the position D the ball valve is contacted by a rock arm 8 on a spindle 9 journaled on the frame of the machine. This spindle is actuated by means of a rock arm 10 secured thereto, which is adapted to be contacted by a part of the cup. A small

weight 11 tends to yieldingly maintain the rock arm 10 in position to be engaged by the cup. As soon as the cup passes by the ball 7 again drops and the ball lifting mechanism assumes its normal position ready to operate when the ball valve of the next cup is brought past it.

Each cup next passes the position E and finally reaches the position F, where it is in alinement with the feeding mechanism hereinafter described.

While various devices may be employed to impart a stepwise rotary movement to the carrier 3, I prefer to employ the Geneva movement shown. A disk 12 is provided with a depending flange having formed therein as many semi-circular spaces 13 as there are cups on the carrier. Between these spaces are formed the notches 14. A drive shaft 15 suitably journaled on the frame of the machine carries a disk 16 provided with a semi-circular locking flange 17 suitably shaped to engage the spaces 13 and provided also with a pin 18 adapted to operate in the notches 14. The disk 12 is held stationary while the locking flange is in engagement with any one of the spaces 13, but is actuated as soon as the pin 18 enters a notch 14. The device, being known in the art, need not be more particularly described.

The feeder mechanism is provided with a point 19 adapted to impale an apple contained in a cup at the position F as shown in Fig. 1. This point is connected with a slide 20, which is rotatable in and movable lengthwise of a curved guide 21. The lower end of this guide is substantially parallel to the core axis of an apple contained in the cup, while the other end of the guide is substantially parallel to the axis of the prongs of an apple paring machine.

A stem 22 is connected with the silde 20, which stem is adapted to slide in a rotary guide 23 suitably journaled on part of the curved guide 21. This rotary guide is situated with its axis at the point of intersection of two lines defining the direction of movement of the point at each end of the curved guide. The result is that if the slide be reciprocated in the guide, it will alternately occupy the position shown in full and dotted lines in Fig. 1, the motion of the point 19 at one end of the stroke being substantially in alinement with the core axis of the apple and at the other end of its movement in alinement with the prongs of the paring machine.

The movement of the slide 20 is effected by means of the rock arm 24, which is provided with a slot embracing a cylindrical portion 25 of the slide. A short rock arm 26 is secured to the rock arm 24 and extends in the opposite direction from the pivot 27. By means of a pivoted connecting rod 28, this short rock arm 26 is connected with the slide rod 29, which is operated by an eccentric 30 carried by the driving shaft 15.

It is preferable that there shall be a certain amount of yield to the point 19 so that each apple impaled, no matter what its size, may be properly positioned in contact with a collar 31 formed on the point, which prevents the point entering the apple too far and which gives proper resistance when the apple is being impaled by the prongs of the paring machine. I therefore provide the slide 20 with a fixed sleeve 32 on which is located a tension coil spring 33 which engages the sleeve and a collar 34 secured on the stem of the point 19, which collar limits the extension of the point under the action of the spring. The point may thus yield as much as may be necessary.

It will be understood, of course, that I do not restrict myelf to the use of the imperforate cups shown, as perforated cups might be employed and flotation and positioning effected, by dipping the cups into a tank of water and subsequently removing them therefrom.

What I claim as my invention is:—

1. In an apple feeding machine, the combination of a positioning cup adapted to contain a single apple; and means for temporarily floating the apple in liquid in said cup to cause it to assume a position with its core axis substantially vertical and thereafter lowering the liquid level in the cup to cause the apple to be supported by the cup.

2. An apple feeding machine constructed as set forth in claim 1 provided with a feeder having a point adapted to impale an apple; means for moving the feeder to impale an apple contained in the cup, withdrawing the feeder, turning it and moving it in a straight line with the apple advanced.

3. An apple feeding machine constructed as set forth in claim 1 provided with a feeder adapted to engage an apple; means for moving the feeder to engage an apple contained in the cup; for withdrawing the feeder, turning it, and moving it with the apple advanced.

4. In an apple feeding machine, a positioning cup adapted to contain a single apple and formed of a bell shape with a rounded bottom.

5. An apple feeding machine constructed as set forth in claim 1 in which the cup is adapted to contain liquid and is provided with a valve controlled opening in its bottom for the escape of the liquid.

6. In an apple feeding machine, the combination of a series of positioning cups each adapted to hold water and to contain a single apple; means for moving said cups in a closed orbit; means for introducing liquid into each cup in turn; and means for sub-

sequently permitting the escape of the liquid; and means for removing the apple from each cup after it is emptied.

7. In an apple feeding machine, the combination of means for positioning an apple by flotation and for steadying it in position; a feeder having a point adapted to impale an apple; means for moving the feeder to impale an apple contained in the cup, withdrawing the feeder, turning it and moving it in a straight line with the apple advanced.

8. In an apple feeding machine, a feeder comprising a curved guide; an impaling point movable along the guide and adapted to swing on an axis at right angles to the guide; a rotary guide situated at the point of intersection of two lines defining the desired direction of movement of the point at each end of the guide; and a stem connected with the point and extending parallel to, but in the opposite direction to said point and adapted to slide in said rotary guide.

Signed at Toronto, Canada, this 24th day of Feb., 1921.

CHARLES A. BIGGS.