G. L. BEDKER.

APPLE GRADING MACHINE.

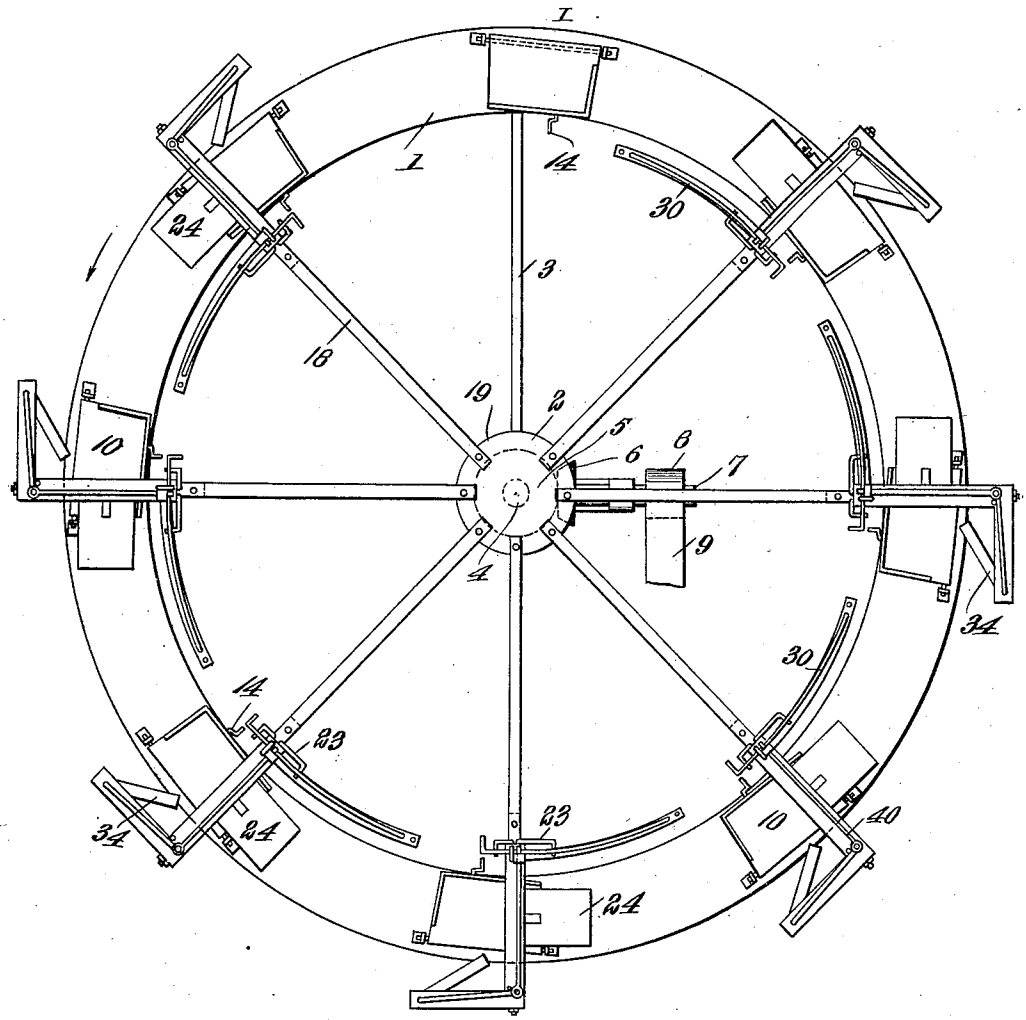
APPLICATION FILED NOV. 27, 1909.

977,365.

Patented Nov. 29, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 2.

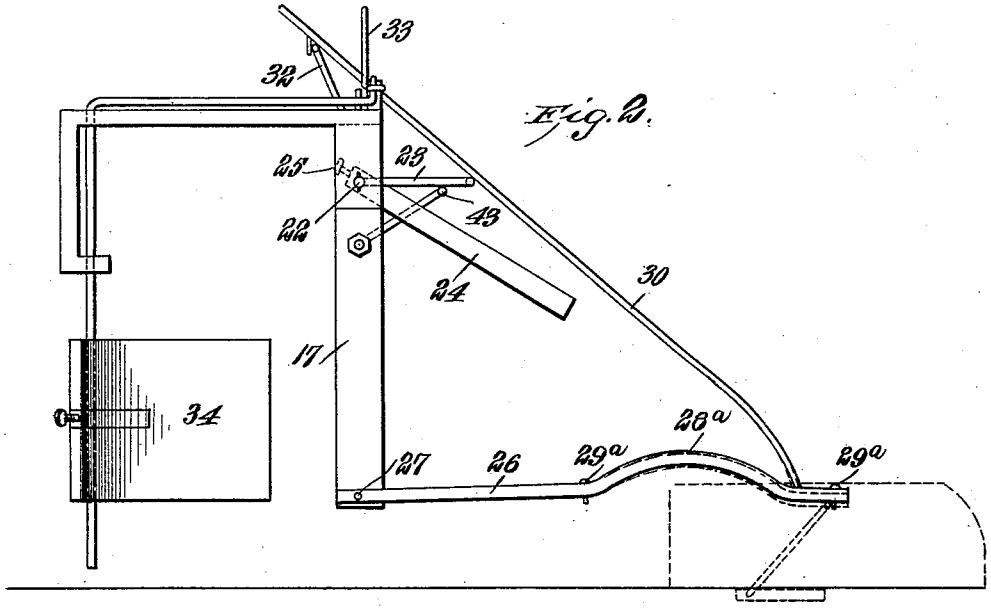
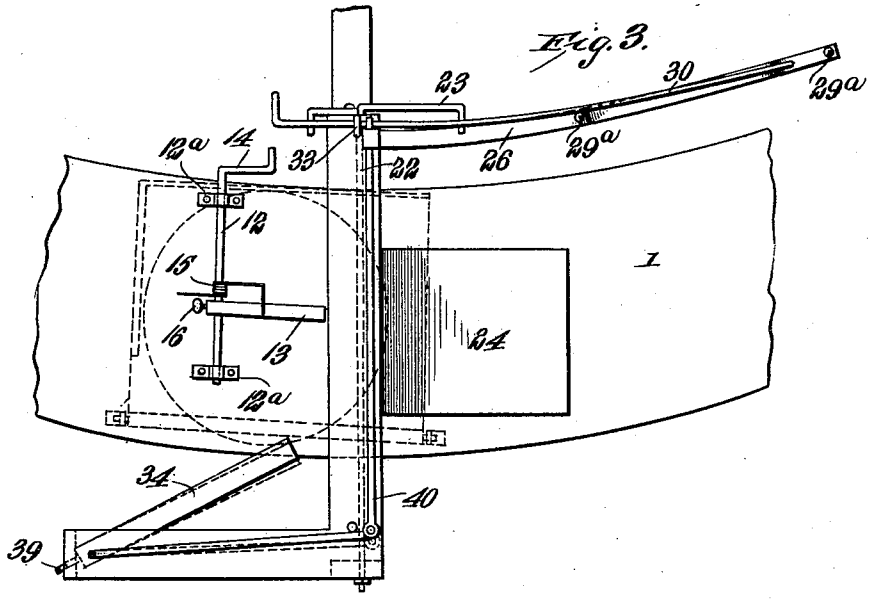


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

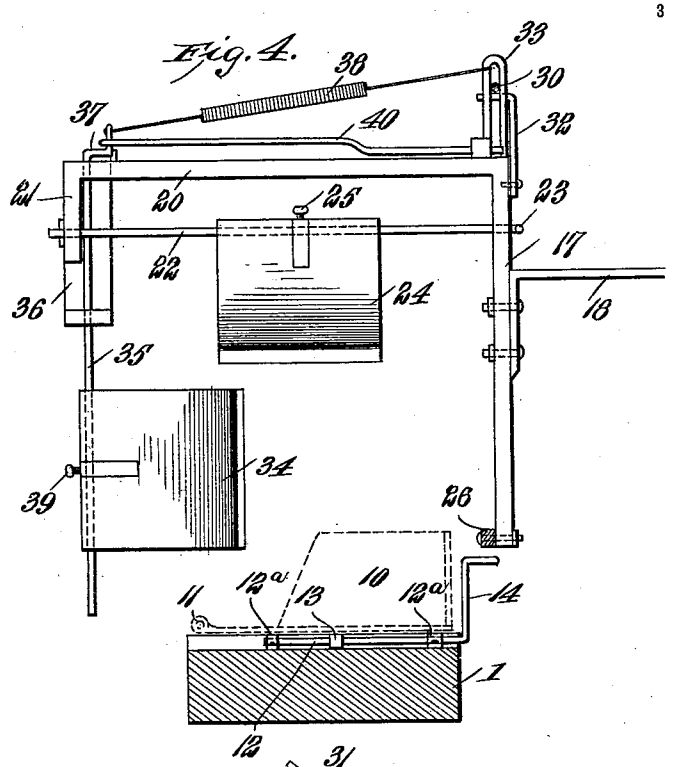
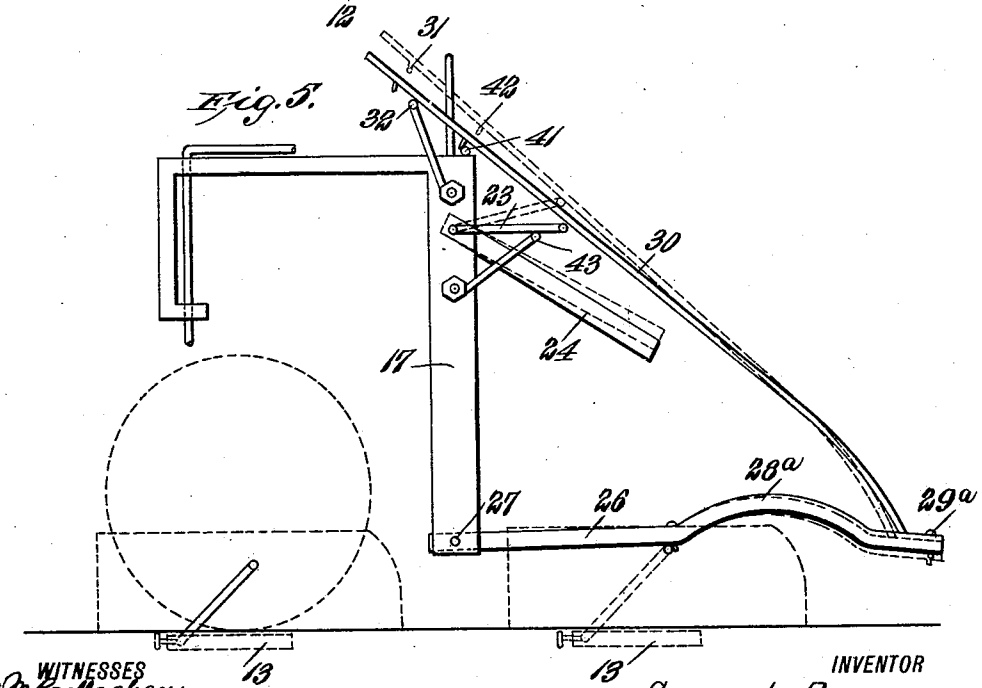


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE LEE BEDKER, OF NORTH YAKIMA, WASHINGTON.

APPLE-GRADING MACHINE.

977,365. Specification of Letters Patent. Patented Nov. 29, 1910.

Application filed November 27, 1909. Serial No. 530,214.

To all whom it may concern:

Be it known that I, GEORGE LEE BEDKER, a citizen of the United States, and a resident of North Yakima, in the county of Yakima, State of Washington, have invented certain new and useful Improvements in Apple-Grading Machines, of which the following is a specification.

My invention is an improvement in apple grading machines, and consists in certain novel constructions and combinations of parts hereinafter described and claimed.

The object of the invention is to provide a machine of the character specified which will automatically separate the fruit in accordance with predetermined measures, distributing the apples into piles of like size.

Referring to the drawings forming a part hereof: Figure 1 is a plan view of the improvement; Fig. 2 is an enlarged partial side view of a portion of the grading machine; Fig. 3 is a plan view of the same; Fig. 4 is an end view of the same; and Fig. 5 is a partial side view showing the machine in another position.

The embodiment of the invention shown in the drawings consists of a table composed of a rim 1, a hub 2, and spokes 3 connecting the hub and rim, and the hub is journaled for rotation on a standard 4. The hub has secured thereto a bevel gear wheel 5, which is engaged by a bevel pinion 6, on a power shaft 7, journaled adjacent to the table and provided with a pulley 8 which is connected by a belt 9 with any suitable source of power.

Containers or receptacles 10 are hinged to the rim of the table at suitable intervals, each of the containers having an open outer side, and the hinge 11 is at the outer edge of the rim. A shaft 12 is journaled transversely of the bottom of each receptacle in bearings 12^a on the table and is provided intermediate the ends with an arm 13 and the inner end of the shaft is provided with a crank arm 14. Each of the shafts is encircled by a coil spring 15, one end of which engages the arm 13, and a set-screw 16 is threaded through the arm for retaining the shaft in adjusted position.

Standards 17 are supported adjacent to the table at suitable intervals by means of radial arms 18 which extend from a disk 19 secured to the upper end of the standard 4, and supported by each standard is a grading and dumping device. The said devices are all alike, so that only one will be described.

An arm 20 extends radially outward from each of the standards, the outer end of each arm having a depending portion 21, and in the standard and the depending portion of each arm is journaled a shaft 22, whose inner end is provided with a crank arm 23, and at approximately the center of each shaft a leaf 24 is arranged.

The leaves are rectangular as shown, and each is provided with a transverse opening near one edge through which the shaft extends, and a set-screw 25 threaded through the leaf engages the shaft to retain the leaf in adjusted position. The said leaves are in position for engagement by apples of a certain height, and it is obvious that when an apple of the proper height strikes the leaf it will be tilted to rock the shaft. A curved arm 26 curved to roughly conform with the periphery of the table is pivoted by one end to each standard, as at 27, and the other end extends along the inner edge of the table rim, as shown in Fig. 3. Near its end the arm is provided with an upwardly curved portion 28^a and at each end of the said portion a set-screw 29^a is threaded through the arm.

The set-screws are adapted to engage the crank arms 14 under circumstances to be presently set forth to oscillate the shaft 12 and dump the receptacle. The arm 26 is, however, normally held out of position for engagement by the crank arms by a rod 30, whose one end is secured to the arm near its outer end. The other end of the rod is provided with a plurality of lugs 31 for engaging stops 32 at the top of the standard.

Each rod passes through a loop 33 on the standard as shown in Fig. 4, the loop acting as a guide for the rod, and it will be evident that as long as the lugs are engaged with the stops the arm 26 will be retained in lifted position. When, however, the rod is lifted by the crank arm the arm 26 is permitted to drop to bring the set-screws 29 into position for engagement by the crank arms 14.

The leaves 24, it will be understood, are arranged at different heights from the rim 1 of the table, and gage the height of the apples. Other leaves are provided for gaging the cross section of the apples. Each standard 17 supports one leaf of each kind.

The side leaves 34 are similar to the leaves 24, each being provided with a transverse bearing near one edge, through which passes a vertical shaft 35 journaled in a bracket 36 integral with the arm 20. The upper end of the shaft is provided with a crank arm 37, and a spring 38 connected at one end to the loop 33 and at the other to the crank arm yieldingly holds the shaft in a position such that the free edge of the leaf 34 extends into the path of travel of the apple, the leaf being secured to the shaft by a set-screw 39.

A link 40 is pivoted by one end to the crank arm 37 of the vertical shaft and the other end 41 extends into position for engagement by another lug 42 on the rod 30. The crank arm 23 of the shaft 22 is normally supported in the position shown in Fig. 2 by a stop 43, upon which the crank arm rests.

In using the machine, the operator stands in the position marked I in Fig 1 at which point the grading devices are omitted, and places the apples or other fruit to be graded onto the receptacle as they pass the wheel being rotated by the power shaft 7.

The table rotates in the direction of the arrow, and the leaves 24 are arranged at gradually decreasing distances from the surface of the table, while the leaves 34 are arranged at gradually decreasing distances from the center of the wheel.

If, for instance, the lower edge of the first of the leaves 24 is at a height of 3 inches from the table, and the inner edge of the first of the leaves 34 at a distance of 3 inches from the inner side of the receptacle, all apples less than 3 inches in diameter will pass the said leaves. Apples of three inches or greater diameter will, however, swing the leaves.

If the apple is of a diameter sufficient to swing the leaf 34, the end 41 of the link is withdrawn from in front of the lug 42, and the rod 30 is permitted to move longitudinally a short distance, but is almost immediately checked by the stop 32 engaging the lug 31. The apple next reaches the leaf 24 and if it is not high enough to swing the said leaf the crank arm on the receptacle is engaged by the outermost set-screw 29^a and the receptacle is lifted to dump the apple toward the outer side of the table.

If the apple is also high enough to swing the leaf 24, the upper end of the rod is lifted to disengage the stop 32 from the lug 31 and the arm 26 drops low enough so that the inner set-screw 29^a is engaged by the crank arm 14 and the apple is turned out at another point. In both cases the lifting of the receptacle lifts the rod 30 and returns it to its original position.

It will be evident that the device is entirely automatic after the apples are placed in the receptacles, and that the dumping of each apple resets the mechanism for the next one. Each standard is provided with two graders, one for diameter and one for height, and the division of the apples or other fruit into their different grades will be much more perfect than could be done by hand.

It will be observed that the leaves 34 are adjustable vertically on the shafts, and that the leaves 24 are adjustable horizontally, and the inclination of both may also be varied to bring the free edges thereof nearer to or farther from the apple in the receptacle. This is permitted by the set-screws which hold them to their respective shafts.

The tilting of the receptacle is caused by the oscillation of the shaft 12, the arm 13 lifting the receptacle and the spring 15 returns the shaft to its original position.

I claim:

1. A device of the class described, comprising an annular rotatable table, a plurality of receptacles arranged in spaced relation on the table and hinged near the outer edge thereof, a shaft arranged transversely of each receptacle and provided on its inner end with a crank arm extending beyond the inner edge of the table, and a plurality of grading and dumping devices arranged in spaced relation adjacent to the table, each of said devices comprising a fixed standard, an arm pivoted by one end to the standard and extending alongside the inner edge of the table, set-screws near the free end of the arm and arranged in spaced relation for engaging the crank arms to dump the receptacles, a rod secured by one end to the free end of the arm, a loop on the standard through which the other end of the rod extends, a vertical shaft journaled on the standard, a leaf adjustably secured to the shaft by one edge, the other edge extending into the path of movement of an article in the receptacle, said shaft having a crank arm, a link connected by one end to the crank, the other end extending adjacent to the rod, said rod having a lug for engaging the link, a horizontal shaft journaled in the standard, and provided at the end adjacent to the rod with a crank arm for engaging and lifting the rod when the shaft is oscillated, a leaf adjustably secured by one edge to the horizontal shaft, the other edge extending toward the receptacle, a stop on the rod, and a lug on the standard for engaging the stop, for the purpose specified.

2. A device of the class described, comprising an annular rotatable table, a plurality of receptacles arranged in spaced relation on the table and hinged near the outer edge thereof, a shaft arranged transversely of each receptacle and provided on its inner end with a crank arm extending beyond the inner edge of the table, and a plurality of grading and dumping devices

arranged in spaced relation adjacent to the table, each of said devices comprising a fixed standard, an arm pivoted by one end to the standard and extending alongside the inner edge of the table, set-screws near the free end of the arm and arranged in spaced relation for engaging the crank arms to dump the receptacles, a rod secured by one end to the free end of the arm, a loop on the standard through which the other end of the rod extends, a plurality of leaves mounted to swing on each standard and adapted for engagement by an article in a receptacle, lugs on the rod, and stops connected to the leaves, and movable into and out of engagement with the lugs by the swinging of the leaves.

3. A device of the class described, comprising an annular rotatable table, a plurality of receptacles arranged in spaced relation on the table and hinged near the outer edge thereof, a shaft arranged transversely of each receptacle and provided on its inner end with a crank arm extending beyond the inner edge of the table, and a plurality of grading and dumping devices arranged in spaced relation adjacent to the table, each of said devices comprising a fixed standard, an arm pivoted by one end to the standard and extending alongside the inner edge of the table, set-screws near the free end of the arm and arranged in spaced relation for engaging the crank arms to dump the receptacles, a rod secured by one end to the free end of the arm, a loop on the standard through which the other end of the rod extends, a plurality of leaves mounted to swing on each standard and adapted for engagement by an article on a receptacle to swing said leaves, stops for engaging the rod to prevent movement thereof, and means operated by the swinging of the leaves for releasing the stops.

4. A device of the class described, comprising an annular rotatable table, a plurality of receptacles arranged in spaced relation on the table and hinged near the outer edge thereof, a shaft arranged transversely of each receptacle and provided on its inner end with a crank arm extending beyond the inner edge of the table, and a plurality of grading and dumping devices arranged in spaced relation adjacent to the table, each of said devices comprising means for engaging and lifting the receptacle, a plurality of leaves mounted to swing and adapted to be engaged by an article on a receptacle to swing said leaves, and a connection between said leaves and the lifting means for operating the same.

5. A device of the class described, comprising an annular rotatable table, a plurality of receptacles arranged in spaced relation on the table and hinged near the outer edge thereof, a shaft arranged transversely of each receptacle and provided on its inner end with a crank arm extending beyond the inner edge of the table, and a plurality of grading and dumping devices arranged in spaced relation adjacent to the table, each of said devices comprising means for engaging the crank arm to lift the receptacle, and means operated by the passage of an article in a receptacle for operating said lifting means.

6. A device of the class described, comprising an annular rotatable table, a plurality of receptacles arranged in spaced relation on the table and hinged near the outer edge thereof, a shaft arranged transversely of each receptacle and provided on its inner end with a crank arm extending beyond the inner edge of the table, and a plurality of grading and dumping devices arranged in spaced relation adjacent to the table.

7. In a device of the class described, an annular rotatable table, a plurality of receptacles for containing articles to be graded hinged by one edge to the table and arranged in spaced relation, means for lifting the receptacles to discharge the articles therefrom, means for retaining said means out of engaging position, a plurality of leaves mounted to swing and adapted for engagement by an article on the receptacle to swing the same, and a connection between the leaves and the retaining means for releasing the same to permit it to move into engaging position when the leaves are swung.

8. In a device of the character specified, a receptacle for containing articles to be graded, means for lifting the receptacle and discharge the articles therefrom, a shaft secured to the receptacle and provided with a crank arm extending therebeyond, an arm normally out of the path of the crank arm and having means for engaging the arm to lift the receptacle, means for retaining said arm in normal position, a swinging leaf adapted to be engaged and swung by an article in a receptacle, and a connection between said leaf and the retaining means for releasing the same to permit it to move into engaging position.

9. In a device of the class described, a rotatable hinged support for the article to be graded, a relatively fixed arm having means for engaging the support to swing said support as it moves thereby and discharge the article therefrom, a stop for retaining said arm in inactive position, a swinging leaf connected with the stop for engagement by an article of predetermined size to move the stop to release the arm, and means whereby the swinging of the support will return the arm to its inactive position.

10. In a device of the class described, a rotatable hinged support for the article to be graded, a relatively fixed arm having means for engaging the support to swing

said support as it moves thereby and discharge the article therefrom, a stop for retaining said arm in inactive position, and a swinging leaf connected with the stop for engagement by an article of predetermined size to move the stop to release the arm.

11. In a device of the class described, means for supporting the article to be graded, means for moving the supporting means, means for positively engaging and swinging the supporting means to discharge the article therefrom, means for retaining said swinging means in inactive position, and means operated by an article of a predetermined size in the receptacle for releasing the retaining means to permit it to move into engaging position.

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Witnesses:
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