(No Model.)

G. L. HARRIS.

FRUIT CLEANING APPARATUS.

No. 455,564. Patented July 7, 1891.

Fig. 1.

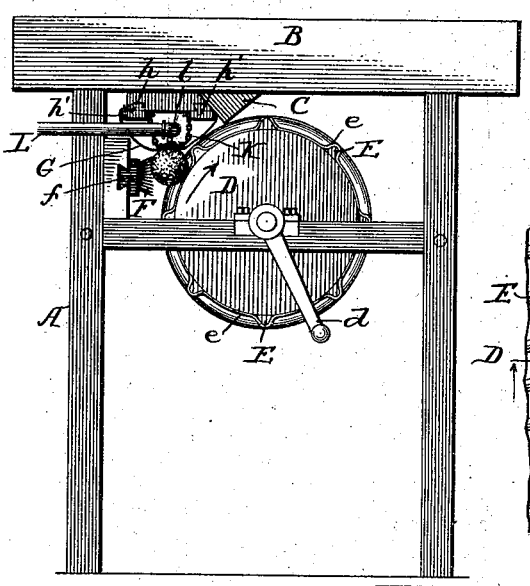


Fig. 3.

Fig. 5.

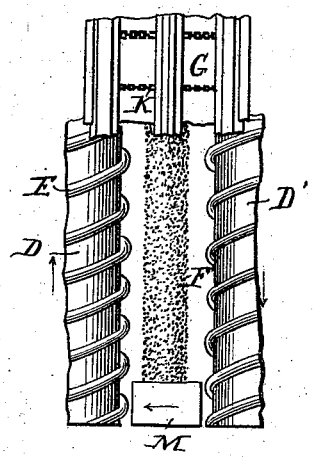


Fig. 2.

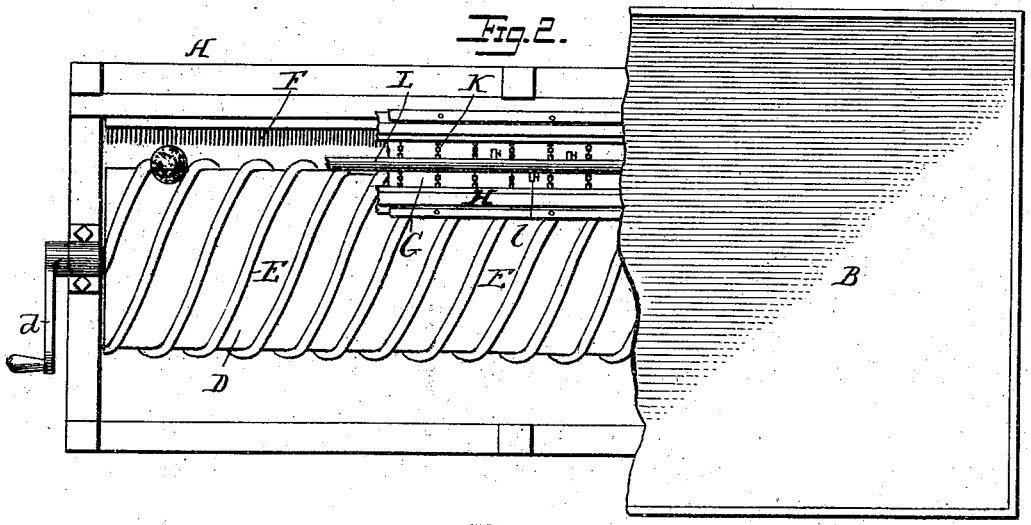
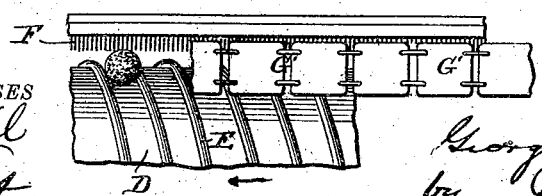


Fig. 4.



WITNESSES

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GEORGE L. HARRIS, OF BUFFALO BLUFF, FLORIDA.

FRUIT-CLEANING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 455,564, dated July 7, 1891.

Application filed March 28, 1891. Serial No. 386,777. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. HARRIS, a citizen of the United States, residing at Buffalo Bluff, in the county of Putnam and State of Florida, have invented certain new and useful Improvements in Fruit-Cleaning Apparatus, of which the following is a specification.

My invention has for its object to produce a machine for cleaning fruit, especially oranges, and for preparing them for market; and it consists of a brush or equivalent cleaning or wiping device, against which the fruit is held by a flexible or yielding device of such nature that it readily adapts itself to the fruit whatever be its size or shape, and a screw or worm shaft or other conveyer, which feeds the fruit along past the brush.

It also consists of means whereby the orange is moistened during a portion of the brushing or cleaning operation and for subsequently drying it, and, further, in the details of construction of the machine, all of which will be hereinafter pointed out.

In the drawings, wherein is illustrated a machine embodying my invention, Figure 1 is an end view of such machine. Fig. 2 is a top plan view, parts being broken away. Fig. 3 is an end view form of the flexible or yielding pressing device detached. Fig. 4 is a plan view of another form of pressing device, showing position above the brush and advancing or feeding roller; and Fig. 5 is a plan view of another form of the invention employing two feeding-rollers and a brush arranged between them, parts being broken away.

In the drawings, A represents the frame-work of the machine or apparatus, over the top of the whole or a portion of which is mounted a bin or receptacle B, into which the oranges or other fruit to be treated are placed. The floor or bottom of this bin inclines toward the front or head end of the machine, where there is a delivery-opening leading into a feeding-chute C.

D is a cylinder or roller mounted longitudinally in the frame, it being provided at one end with a crank *d* or other suitable device for driving it. Upon its surface are arranged spiral ribs or worms E, which serve, as the cylinder D is revolved, to advance the fruit. This roller, with the ribs E, is preferably covered with cloth *e*, which assists in cleaning the oranges, and also gives to them a rolling sort of motion, and thus brings all portions thereof into contact with the cleaning-brush. F is this brush, against and along the face of which the oranges are moved by the worm-cylinder D. The preferred form of brush is shown in Fig. 1, and consists of a stationary back carrying the bristles, arranged to one side of and a little above the center of the cylinder D and with its brushing-face at such distance therefrom that the smallest size of fruit which is to be treated will not fall between it and the cylinder. The brush-back is preferably dovetailed, as shown at *f*, and is slid lengthwise into suitable supports therefor carried by the frame-work A. This permits the brushes to be easily removed and replaced when from any cause this is found desirable. I prefer to make the brushes in two or more sections by dividing it transversely, so that one part or section may be removed and replaced without disturbing the other portions.

Instead of a flat stationary brush such as has been just described, I may employ a cylindrical brush, as shown at F′, Fig. 5.

The cylinder D is rotated in the direction of the arrow in Fig. 1, and tends to carry the orange upward, so that there is no danger of its being squeezed too tightly or injured between the brush and the roller.

In order to gently force the orange against the brush-surface, I have devised and make use of a flexible or yielding pressing device, which bears upon the orange from above. The form of pressing device which I prefer to use and which I have found to work most satisfactorily consists of a piece or pieces of slack cloth hung so as to sag down upon the fruit as it is moved past the brush and lightly weighted upon its upper surface.

G represents the cloth which constitutes this flexible presser. It is carried by a removable frame H, which is adapted to be slid into ways *h* on the under side of the bin B immediately over the path traversed by the oranges as they are fed by the roller D along the face of the brush. The frames H are easily removable from the machine, and the cloths G may be readily detached from the frames, they being held thereon by

hooks I, over which the edges of the cloth are caught, or in any other suitable manner. The frame carrying the cloth or cloths G, which constitute the presser, may be of a single piece of material, as shown in Fig. 3, or of two side bars or pieces *h'*, to which the edges of the cloth are secured, as shown in Fig. 1. I prefer to divide the frame H transversely into two or more parts, so that one portion of the presser may be removed from the frame without disturbing the other portion or portions.

K K are light chains suspended from the way-pieces *h* under the bin, as shown in Fig. 1, or, if preferred, from the frame or rack H, as shown in Fig. 3, this last way of suspension being used when the cloth-supporting frame is of a single piece. These chains are placed at intervals of five or six inches and sag down upon the cloth G and serve as weights to hold the cloth down with a light yielding force upon the fruit which may be moving beneath them.

Instead of the weighted cloth-pressing device, I might employ a series of short pads G', Fig. 4, flexibly connected, as shown. These pads, resting upon the oranges as they pass through the apparatus, hold them gently against the brushes and the roller D, and by reason of these flexible connections bear upon the oranges of all sizes alike; but I much prefer the form of pressing device first described.

L is a water-pipe arranged above the yielding presser and provided with a number of drip-cocks *l*. By opening to the proper extent the cocks at the head end of the machine a portion of the cloth-presser G is wet, and the oranges are washed, as well as brushed. The cloth near the tail or delivery end of the machine being dry wipes off and dries the fruit before it passes from the machine.

In Fig. 5 I have shown a machine with two worm feeding-rollers D D' and a circular brush and two yielding pressing devices. In this machine the roller D moves the oranges away from the head end of the machine to the tail end of the brush, where there is a transverse track or way M for the oranges, by which they are conducted to the other roller D, which moves them back toward the head end of the machine in contact with the side of the brush opposite that with which they engaged when moving in the opposite direction. A machine of this construction need be only about one-half the length of a machine which has but one feeding-roller. Of course two flat stationary brushes upon the outer sides of the rollers D might be used instead of the one centrally-arranged brush, as shown.

The delivery-chute through which the cleaned oranges are carried out of the machine (not shown) may lead to an assorting-machine or upon a table, when the oranges may be picked over and assorted by hand.

In all prior orange brushing and cleaning machines of which I have knowledge it has been necessary to "size" the oranges before they are cleaned, in order that oranges of only a certain uniform size shall be fed through the machine at one time, as in such machines there must be an adjustment between the brush and feeding cylinder or roller for each size of fruit in order to insure good results and to prevent oranges of a small size from dropping through between the brush and the feeding-roller.

With my machine all such adjustments are unnecessary, and I am enabled to pass the oranges directly to the machine in the unassorted condition in which they come from the grove, because the yielding pressing device which I have described sags or falls down upon each individual fruit irrespective of its size as it is passed along, embracing or covering its upper portion to a greater or less extent and serving not only to hold it in contact with the brush and feeding-roller, but also to wipe and clean it. The cloth covering to the cylinder acts also as a cleaner for the orange, and also, by reason of the certain amount of roughness which it gives to the roller, to cause the orange to roll, so that every portion of its surface is thoroughly brushed and cleaned.

By making the racks or frames H removable and detachably securing the cloths thereto I am enabled to readily remove them whenever desirable, as when the cloths at the tail end of the machine become so moistened that they will not dry the oranges before they leave the machine or when any part of the cloths become dirty, and when the frames are so removed the cloths may be easily taken off of them and washed or dried.

I wish it to be understood that certain features of the present invention might be used upon or in connection with machines different from those illustrated. For instance, the cloth-covered roller might be used as a feeder or conveyer in many different kinds of machines.

Without limiting myself to the precise construction and arrangement of parts shown, what I claim is—

1. In a fruit-cleaner, the combination of a brush or cleaner, a feeding device, and a pressing device independent of the feeding device, adapted to bear upon the fruit and hold it against the brush or cleaner, substantially as shown.

2. In a fruit-cleaning apparatus, the combination of a stationary brush, a feeding-cylinder, and a yielding presser adapted to bear upon the fruit, substantially as set forth.

3. In a fruit-cleaning apparatus, the combination of the brush or cleaner, a feeding or advancing device for the fruit, and a yielding pressing device bearing upon the fruit, consisting of weighted cloth or cloths, substantially as set forth.

4. In a fruit-cleaner, the combination of a brush, a feeding-cylinder, and a pressing device consisting of a removable frame to which

are secured pieces of cloth and the chains which bear upon the upper side of the cloth, substantially as set forth.

5. In a fruit-cleaner, the combination of a brush, a feeding-cylinder, and a yielding presser bearing upon the fruit, made in separately-removable sections, substantially as set forth.

6. In a fruit-cleaner, the combination, with the advancing cylinder, of the flat stationary brush made in separately-removable sections, substantially as set forth.

7. In a fruit-cleaner, an advancing cylinder provided with a worm or screw-rib and covered with cloth, substantially as and for the purposes set forth.

8. In an orange-cleaner, the combination of a feeding device for advancing the oranges through the machine, a dampening and cleaning device for the oranges, and a drying device therefor, substantially as set forth.

9. In a fruit-cleaning device, the combination of the feeding-cylinder, the brush, the yielding cloth-presser bearing upon the fruit, and means for moistening the fruit at the head or feed end of the apparatus, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE L. HARRIS.

Witnesses:
J. S. BARKER,
W. E. NEFF.