Sept. 30, 1930. H. B. HATCH 1,777,039

RUBBING APPARATUS

Filed Nov. 25, 1927

Fig. 1.

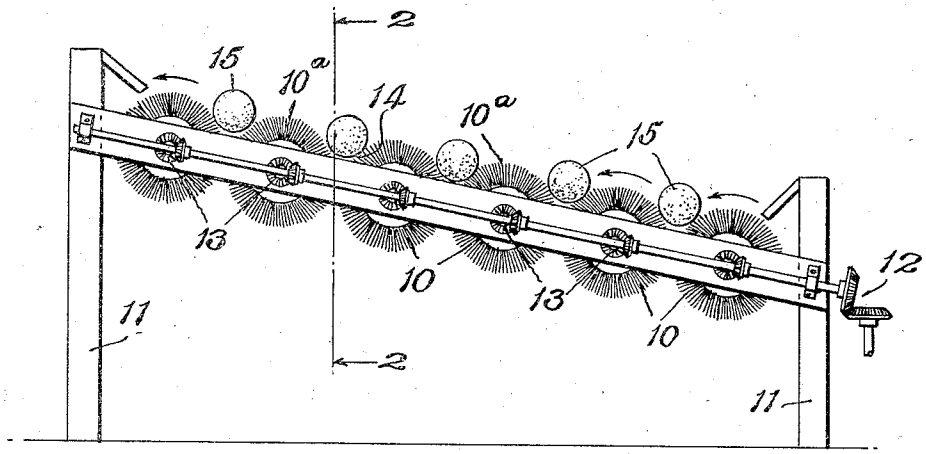
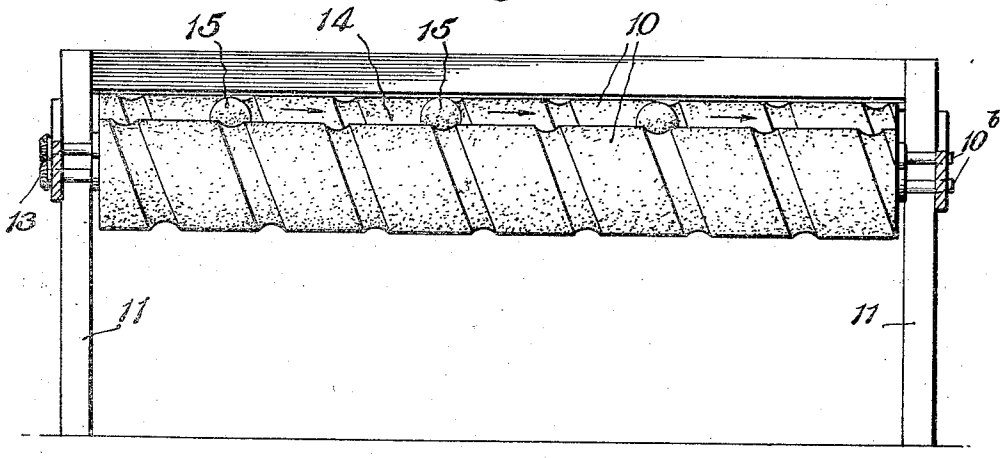


Fig. 2.



Inventor

Hugh B. Hatch,

By Howard McKay

his Attorneys

Patented Sept. 30, 1930 1,777,039

UNITED STATES PATENT OFFICE

HUGH BRENTON HATCH, OF DUNEDIN, FLORIDA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO FLORIDA CITRUS MACHINERY COMPANY, OF DUNEDIN, FLORIDA, A CORPORATION OF FLORIDA

RUBBING APPARATUS

Application filed November 25, 1927. Serial No. 235,587.

This invention relates to rubbing apparatus; and it relates more particularly to apparatus useful especially for rubbing and polishing articles which are of generally globular shape.

The greatest present utility of the invention is for rubbing and polishing fruits and vegetables such as oranges, grapefruit, tangerines, and the like, and a specific embodiment of the invention, particularly adapted to such use, will hereinafter be described, but it is to be understood that the invention is not limited to the particular construction here shown or to the field of polishing fruit.

In the preparation of certain globular fruits for market it is customary to subject the articles to the action of rubbing means either for the purpose of cleansing the fruit (with or without application of water) or for the purpose of giving it a shine or polish, or for both these purposes. This is particularly true of citrus fruits which are almost invariably washed as a matter of necessity, since they are generally very dirty when received in the packing house. They are also often polished after being dried off.

Heretofore the polishing operation has been usually carried on in machines comprising a plurality of rotable rubbing members, such as brush rolls, disposed close together and in parallel with their upper surfaces substantially in the same plane which is sometimes horizontal and sometimes slightly sloped lengthwise of the rolls, but not transversely thereof; the rubbing members being rotated in the same direction and cooperating in pairs to form a plurality of parallel polishing runways along which the fruit travels. Substantially the same construction has also been used in fruit washers. While these machines have been extensively used, they have nevertheless been somewhat objectionable in that they permit the articles being rubbed or polished to be carried out of the runways to some extent and, migrating transversely, to collect at the side of the machine toward which the polishing members rotate, with resultant overcrowding at that side and injury to the fruits.

Proposals for obviating this defect in such machines have been advanced heretofore but have not proved entirely adequate to solve the problem in a practical manner.

An important object of this invention is to provide an arrangement of apparatus for rubbing globular fruits and like articles, which is simple in character but which effectively prevents the articles from being carried, by reason of the rotation of the brushing members, out of the rubbing or polishing runway which they first enter,—in other words, to overcome the tendency of articles in these machines to jump, in the direction of rotation, from one runway to another.

Another and more general object is to provide apparatus of this character for more efficiently and thoroughly rubbing articles fed thereto.

These and other objects, which will appear more fully as this disclosure proceeds, are achieved by arranging the rotary rubbing members or rolls in such manner that their active upper surfaces are presented substantially in or tangent to one plane which, in contrast with constructions previously known, slopes upward, transversely of the longitudinal axes of the rolls, in the direction in which said upper surfaces are moved when the rolls rotate in the manner hereinabove described. That is to say, counting from that side of the machine away from which the upper surfaces of the rolls move, the upper surface of each succeeding roll is higher than that of its immediate predecessor.

It is apparent that this result is attainable in various ways. Thus, in one embodiment of the invention, the rolls may all be of the same effective diameter with their parallel axes in one plane which slopes in a direction transverse to said axes, specifically at right angles thereto. In another embodiment, the desired result, which is to have the upper longitudinal surface of each polishing member progressively higher than the surface of the one immediately preceding it, in the series, may also be attained by having all the axes in one horizontal plane with a progressive increase in the diameters of the polish-

ing members, so that their upper surfaces may be in or tangent to a single plane which is inclined in a direction which is at right angles, or at any rate transverse, to the polishing runway formed by each pair of polishing members. For economy in manufacture, however, it is generally desirable that the polishing members all have the same diameter.

For the purpose of further explaining the principles of the invention, reference will now be had to a specific embodiment of the invention in fruit-polishing apparatus shown, more or less diagrammatically and by way of example, in the accompanying drawing, wherein.

Fig. 1 is an end elevation, with chute boards omitted, and

Fig. 2 is a longitudinal cross-section on the line 2—2 of Fig. 1.

Referring to the drawings, a plurality of rotatable brush rolls 10, surfaced with horsehair or other suitable rubbing or brushing material, are suitably supported in a frame indicated generally by 11 and driven through appropriate gearing 12, 13. The rolls 10 are arranged to cooperate in forming polishing runways 14 between each pair of such rolls, and, for the purpose of advancing articles being polished along such runways, may have spirally cut brushing surfaces as shown in Fig. 2. It is also permissible, in order to induce feeding of articles along the polishing runways, to have the polishing members inclined longitudinally downwardly from the receiving end of the machine, though spiralling of the brushing surfaces renders this unnecessary, and in the apparatus illustrated the rolls are not so inclined.

As shown, the upper brushing surfaces 10^a of the brush rolls are progressively higher in the direction in which said upper surfaces move. This result is accomplished, in this instance, by having brush rolls of uniform diameter with their axes 10^b in a single plane which is inclined transversely to the polishing runways formed between the brush rolls. Hence the elevation of the rolls increases progressively in the direction in which the rolls are rotated. In the specific embodiment the rolls, as viewed in Fig. 1, are designed to be rotated counter-clockwise, as shown by the arrows. Hence the elevation of the rolls increases progressively from right to left. By so arranging the rolls, the tendency of articles 15 being polished to jump in the direction of rotation from one runway to another, eventually accumulating in the last runway, is counteracted. Articles, such as oranges, which are fed to the polisher, remain in the respective polishing runways which they enter, traveling in the direction shown by the arrows in Fig. 2. The result is that the capacity and efficiency of the novel machine are much greater than could be obtained with earlier types, and uniformity of its brushing or rubbing action is enhanced.

What is claimed is:

1. Rubbing apparatus comprising a plurality of rotatable rubbing members arranged parallel to one another and cooperating in pairs to form one or more rubbing runways, said rotatable rubbing members having their active upper surfaces substantially tangent to one plane, which plane slopes transversely of the longitudinal axes of said rotatable members, whereby each of the higher rubbing members will act as a buffer to the adjacent lower rubbing member to prevent movement of articles placed on the apparatus transversely across the rubbing members.

2. Rubbing apparatus comprising a plurality of rotatable rubbing members of substantially the same external diameter arranged parallel to one another and cooperating in pairs to form one or more rubbing runways, said rotatable members having their parallel axes substantially in one plane which slopes in a direction transverse to said axes, whereby each of the higher rubbing members will act as a buffer to the adjacent lower rubbing member to prevent movement of articles placed on the apparatus transversely across the rubbing members.

3. Rubbing apparatus comprising a plurality of rotatable rubbing members arranged parallel to one another and cooperating in pairs to form one or more rubbing runways, said rotatable rubbing members having their active upper surfaces substantially in one sloping plane, transversely of the longitudinal axes of said rotatable members, and means for rotating said rotatable members so that their upper surfaces move toward a higher portion of said plane, whereby each of the higher rubbing members will act as a buffer to the adjacent lower rubbing member to prevent movement of articles placed on the apparatus transversely across the rubbing members.

4. Rubbing apparatus comprising a plurality of rotatable brush rolls arranged parallel to one another and cooperating in pairs to form one or more rubbing runways, said rolls being arranged with a progressive increase in the elevation of their active upper surfaces, provision being made for rotating such rolls so that their upper surfaces move away from the lower and toward the higher side of the apparatus, whereby each of the higher rubbing members will act as a buffer to the adjacent lower rubbing member to prevent movement of articles placed on the apparatus transversely across the rubbing members.

5. Fruit rubbing apparatus comprising a plurality of rotatable rubbing members arranged parallel to one another and cooperating in pairs to provide individual separate fruit-supporting rubbing runways, and

means for rotating all the rubbing members so that their upper active surfaces move in the same direction transversely of the longitudinal axes of the members, said rubbing members arranged with their upper active surfaces successively higher in the direction of movement of their upper surfaces, whereby fruit placed on the apparatus will be induced to remain in the individual separate runways instead of being carried transversely across the runways of the rubbing members to collect at the side of the machine toward which the members rotate with resultant over-crowding and injury to the fruit.

6. Fruit rubbing apparatus comprising a supporting frame, a plurality of parallel rubbing rolls supported by said frame and arranged with their rubbing surfaces adjacent each other and cooperating in pairs to provide a plurality of rubbing runways, and means for rotating said rolls in the same direction to advance the fruit along the respective runways, said supporting frame being inclined upwardly in the direction of rotation of said rolls whereby the active upper surface of each roll acts as a buffer to the next adjacent lower roll to prevent the fruit from moving transversely out of their respective runways.

In testimony whereof I hereunto affix signature.

HUGH BRENTON HATCH.