Dec. 25, 1928. 1,696,554

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SIZING APPARATUS FOR FRUIT, MELONS, VEGETABLES, AND THE LIKE

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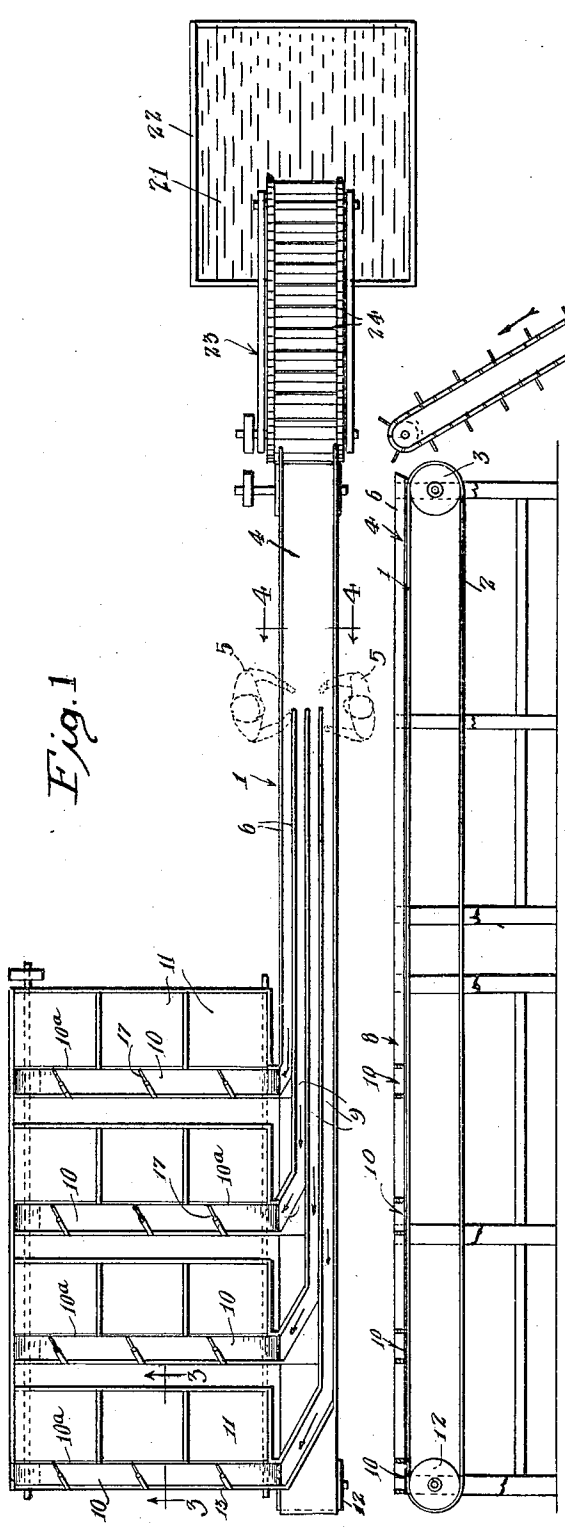


Fig. 1

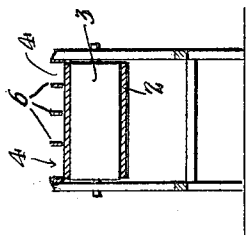


Fig. 4

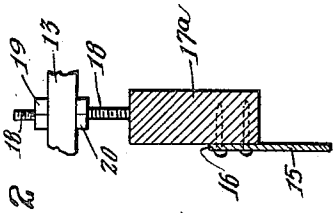


Fig. 5

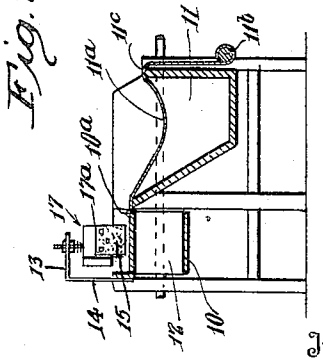


Fig. 3

Fig. 2

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SIZING APPARATUS FOR FRUIT, MELONS, VEGETABLES, AND THE LIKE.

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This invention relates to apparatus, the purpose of which is to effect the sorting of fruit, melons or the like into different grades and sizes. Fruit of some kinds, and particularly melons, have a considerable variation or range in quality and size and if it is attempted to construct a machine or sorting table to sort all the different sizes which occur, the size of the machine and the cost would render it impractical.

The general object of this invention is to produce simple apparatus in which the sorting process may be carried on partially by hand, and which will operate to size and grade fruit or melons having a great range in size and grade. One of my objects is to provide simple apparatus for this purpose which will be suitable for growers producing a small quantity of fruit, as well as for larger quantities.

Another object of the invention is to provide means for engaging the fruit or melons as they pass along the sizing tables in such a way as to deflect the same to bins without causing any injury to the skins or rinds.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combination of parts to be described hereinafter, all of which contribute to produce an efficient sizing apparatus for fruit, melons, vegetables and the like.

A preferred embodiment of the invention is described in the following specification, while the broad scope of the invention is pointed out in the appended claims.

In the drawing:—

Figure 1 is a plan of apparatus embodying my invention showing four units with three sizes.

Figure 2 is a side elevation of the apparatus shown in Fig. 1.

Figure 3 is a cross section taken about on the line 3—3 of Fig. 1, and illustrating details of the mechanical sizing tables and bins.

Figure 4 is a cross section taken about on the line 4—4 of Fig. 1, and particularly illustrating the sorting table where the sorting occurs by hand.

Figure 5 is a vertical section through one of the sizing devices which are employed over the mechanical sorting tables for sizing the fruit without injury.

In practicing the invention, I provide a hand sorting table 1 having conveyor means for advancing the fruit or melons. This means is in the form of endless belts or a belt 2 which passes around long belt pulleys or rollers 3. The receiving end 4 of this table is not divided longitudinally, but the remainder is divided into a plurality of runways corresponding, for example, to four different grades; and these runways are used to enable the fruit to be separated by hand according to their grades. At the side of this sorting table, an operator or operators are located, as indicated by the dotted lines 5. These operators handle the fruit as it passes and place or guide the #1 grade in the runway at one edge of the table and the #2 grade in the runway at the other edge of the table. The #3 and 4 grades are placed in the two intermediate runways. In this way the fruit on this sorting table is divided according to the grades desired.

In order to form the runways, the space above the belt toward its delivery end may be divided into channels by means of longitudinal bars 6 (see Fig. 4). These bars extend part of the length of the conveyor means, i. e., they extend from the delivery end of the conveyor means toward its receiving end. The belts or belt 2 delivers the graded fruit onto an extension table 8 carrying the runways 9 corresponding in width to the width of the fruit. The runways 9 deliver the fruit onto lateral tables 10.

These sizing tables 10 extend laterally in a horizontal direction and extend along past a plurality of bins 11 which are to receive the fruit or melons of different sizes. The outer end of belt 2 passes around a pulley 12.

On these sizing tables 10, the sizing is effected mechanically but this is done by means which will not injure the fruit or melons. For this purpose, above each sorting table 10 I provide a sizing device 17, such as illustrated in Fig. 5. This sizing device is attached at its upper end to a transverse bar or arm 13 which may be constructed as part of a bracket 14 attached to the side of the sorting table. This sizing device is provided at its lower edge with a deflector 15 which is constructed of a soft material such as sheet rubber or a fabric having sufficient stiffness to deflect the fruit without injuring it. This deflector is preferably constructed as a flap extending in an inclined direction with its

lower edge substantially horizontal, and it is secured only at its upper edge 16, the side edges being free so as to permit the flap to flex, if necessary, when engaged by the fruit. This upper edge 16 is attached to a block 17ª, and this block is mounted on the arm or bar 13 so that it can be adjusted up or down to regulate the distance of the lower edge of the flap above the surface of the sorting table on moving belt 2.

For this purpose the upper end of the block is provided with a threaded stem 18 which extends through the bar 13 and is provided with a nut 19 above the bar, and a nut 20 below the same for clamping the stem at any height desired. These flaps 15 are held diagonally or inclined squarely across the sorting tables 10 and opposite the different bins 11. The bins nearest to the belt 2 would carry the larger sizes, and therefore the flaps 15 of the corresponding sizing devices would be furthest from the surface of the belt 2. The sizing devices at the outer ends of the sorting tables 10 would be the nearest to the surface of the tables, while the sizing devices for the intermediate bins would be at an intermediate height; as many sizes as wanted can be added.

In some cases it may be desirable to treat the fruit or melons in a disinfectant bath or coating 21 (see Fig. 2). This bath would be placed in a tank or bin 22 which may be at a lower level than the sorting table 1. In this event, I provide an endless conveyor or elevator 23 which has carriers 24 for carrying the fruit up and delivering it onto the sorting table 1.

In operating this apparatus, the fruit on the receiving end 4 of the sorting table 1 is graded by hand into different grades by placing the same in the different runways 9. These runways deliver to the different mechanical sizing tables 10 which extend laterally, and their sizing devices corresponding to the different bins 11 deflect the melons or fruit into the proper bins.

In order to prevent injuring the fruit or vegetable when falling into the bin, I may provide each bin with a yielding false bottom or cloth, one edge of which is attached to the edge of the bin where the fruit comes into it. The other end of the sheet hangs over the outer edge 11ᶜ of the bin, and carries a counterweight 11ᵇ. This gets the effect of a bag to receive the fruit, the bottom of which becomes more and more depressed as the fruit or vegetables collect in it. When this occurs the sheet 11ª slides freely over the edge 11ᶜ of the bin. A narrow bead 10ª is provided along the edge of each belt 10. This bead prevents the fruit from falling off the belt until passed off by a sizing device.

What I claim is:—

1. In an apparatus for sizing fruit or melons, the combination of a hand-sorting table with conveyor means for advancing the fruit, said table having rails extending part of the length of the conveying means from its delivery end toward its receiving end, and dividing the same into a plurality of open runways adapted to receive the fruit or melons of different grades moved about on the same by the hands of operators located beside the table, and a plurality of laterally extending mechanical sizing tables corresponding respectively to the different runways and receiving the fruit or melons therefrom, each of said lateral sizing tables having a belt for advancing the fruit, bins for the different sizes of fruit alongside of the lateral sorting tables, and gauge devices for sorting the fruit of different sizes into the bins.

2. In an apparatus for sizing fruit or melons, the combination of a hand-sorting table with conveyor means for advancing the fruit, said table having rails extending part of the length of the conveying means from its delivery end toward its receiving end, and dividing the same into a plurality of open runways, the space on the conveyor means in front of the rail ends operating to receive the fruit or melons of different grade to be moved about on the same by the hands of operators located beside the table, and a plurality of laterally extending mechanical sizing tables corresponding respectively to the different runways and receiving the fruit or melons therefrom, each of said lateral sizing tables having a belt for advancing the fruit, bins for the different sizes of fruit along side of the lateral sorting tables, and gauge devices extending across the sorting tables for deflecting the fruit of different sizes into the bins.

3. In apparatus for sizing or gaging fruit, melons or the like, having conveying means for advancing the fruit, the combination of a gage device extending transversely across the conveying means and having a soft flexible flap with its lower edge horizontal and located at a distance from the conveying means, operating to engage the fruit and deflect the same off of the conveying means without injury to the fruit.

4. In apparatus for sizing or gaging fruit, melons or the like, having conveying means for advancing the fruit, the combination of a gage device having a transversely disposed rigid member extending in an inclined position across and above the conveying means and having a soft flexible flap with its lower edge horizontal and located at a distance from the conveying means operating to engage the fruit and deflect the same off the conveying means.

5. In apparatus for sizing or gaging fruit, melons or the like, having conveying means for advancing the fruit, the combination of

a gage device having a transversely disposed rigid member extending across in an inclined position above the conveying means and having a soft flexible flap with its lower edge horizontal, and located at a distance from the conveying means, operating to engage the fruit and deflect the same off the conveying means, and means for adjusting the rigid member up or down to vary the size of the fruit which will be permitted to pass the gage.

Signed at Modesto, California, this 23 day of September, 1926.

ALBERT W. PHELPS.