Aug. 7, 1934. J. E. KIMSEY ET AL 1,969,138

FRUIT AND VEGETABLE SIZER

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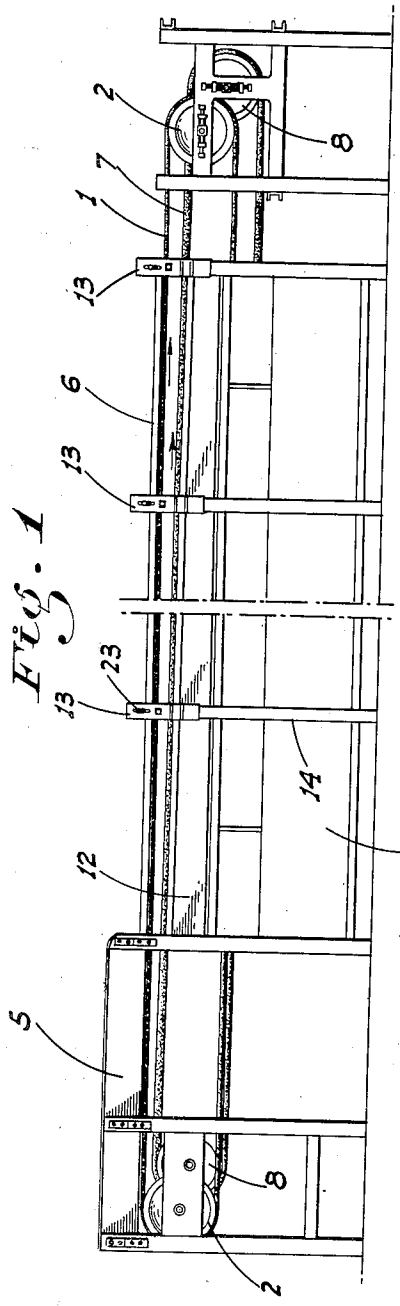


Fig. 1

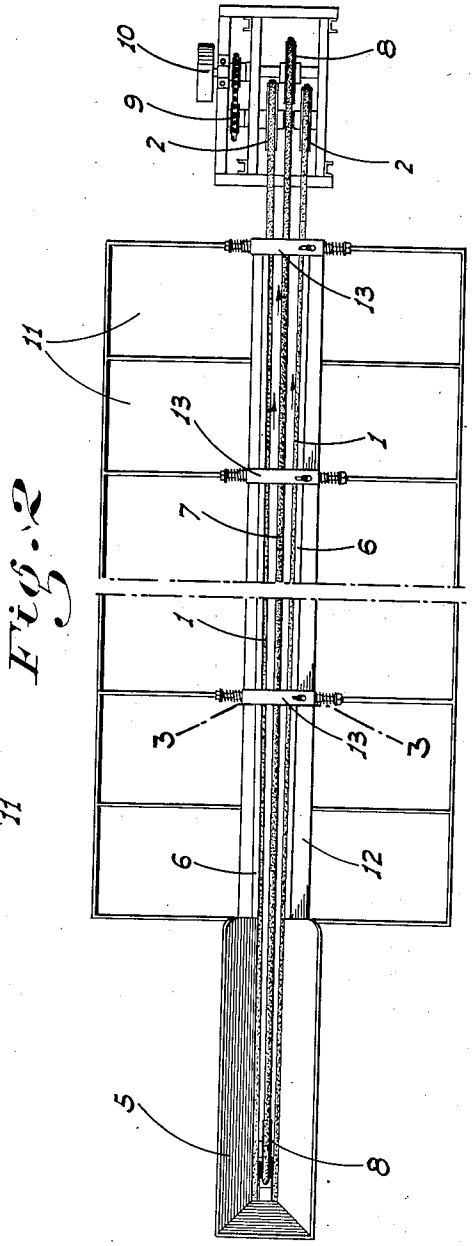


Fig. 2

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Fig. 3

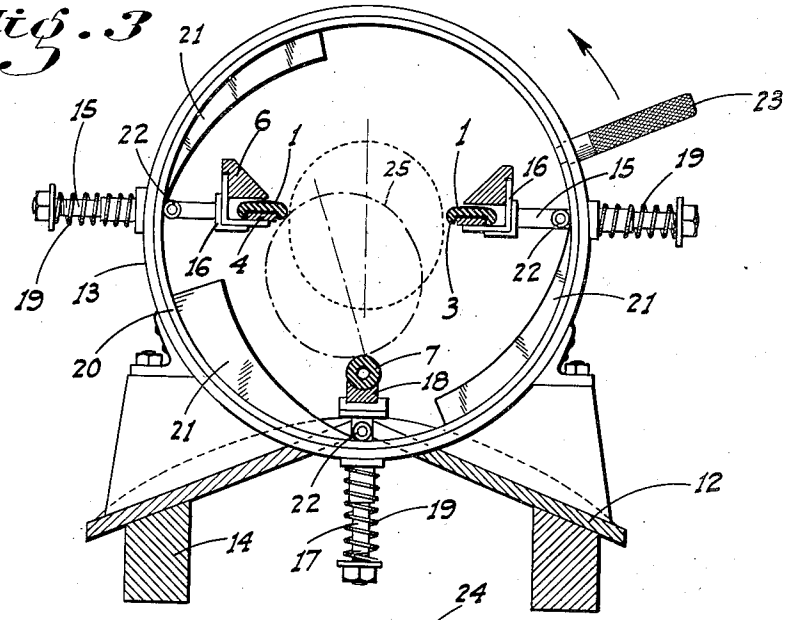
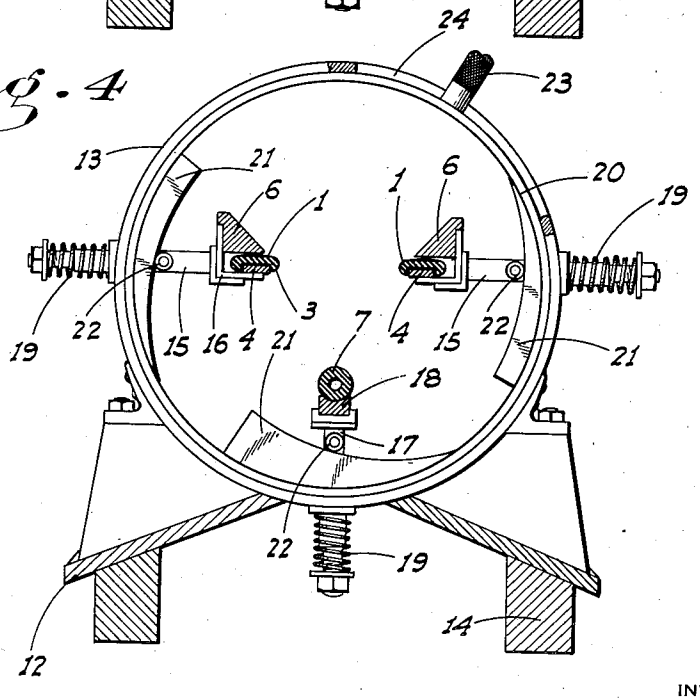


Fig. 4



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FRUIT AND VEGETABLE SIZER

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Yakima, Wash.

Application April 12, 1932, Serial No. 604,722

10 Claims. (Cl. 209—102)

This invention relates to the sizing of fruit and vegetables of that character which while theoretically of circular cross section are apt to be flat on one side or the other so that an erroneous or inaccurate sizing is obtained with the use of the ordinary apparatus. Such ordinary apparatus consists essentially of a slot formed between transversely spaced elements, such as endless traveling belts or ropes disposed in gradually diverging relation to each other so that the articles carried along on the belts will drop through the slots at different intervals depending on the size of the articles relative to that of the slots. If the articles are positioned on the belts so that their flat sides, if any, are alined with the slots such articles will drop through before their actual size warrants it and they become placed with the articles of an actual lesser size so that the sizing obviously is not accurate.

The principal object of our invention is to avoid the objectionable and defective features of such apparatus by the provision of an extra belt or traveling element so arranged relative to the others as to prevent the complete dropping of the articles from between the main slot forming elements unless said article is of the actual size of the corresponding portion of the slots. In other words, an article larger in one direction than the other and in which the larger dimension determines its size, will be retained and will not drop clear of the sizing structure until it reaches the proper receiving bin for such size, even though the article has initially passed through the main slot ahead of the bin on account of its relatively small dimensions caused by one or more flat sides.

A further object is to provide a simple means for adjusting all the belt elements simultaneously so that the spacing therebetween may be adjusted according to different requirements while maintaining the spaced relation between said elements constant at all times.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects we accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a side elevation of the improved sizer.

Fig. 2 is a top plan view of the same.

Figs. 3 and 4 are enlarged fragmentary transverse sections taken on the line 3—3 of Fig. 2 showing the adjusting device in different positions.

Referring now more particularly to the characters of reference on the drawings, the apparatus comprises a pair of transversely spaced belts 1 extending in diverging relation to each other and mounted on the end pulleys 2 disposed with their axes horizontal. The outer faces of these belts are preferably convexed crosswise and are formed with inwardly projecting flanges 3 along their sides. These flanges form the locating and enclosing means for supporting strips 4, and also prevent possible contact of the articles with the stationary strips.

A hopper 5 is associated with the belts at their closely spaced ends so that the articles being sized will be directly received on the belts and carried along the same with the movement of said belts. Bevelled strips 6 extend along and above the belts from the hopper toward the opposite end of said belts, the strips covering all but the adjacent portions of the belts and aiding in guiding and maintaining the articles in place thereon.

Mounted below and centrally between the belts 1 is another belt 7 which is preferably of circular form so that but little area and no sharp edges for contact with the articles are presented. This belt is carried on end pulleys 8, the adjacent ones of the pulleys 8 and 2 being connected in driving relation as by a chain gear 9, so that said belts will be driven at a common speed and in the same direction. A driving means of suitable character may be applied to the shaft of one pulley by a drive pulley 10 or other element thereon.

The upper runs of the three belts are those used to engage the articles to be sized, and they are so disposed relative to each other that the distance between their adjacent surfaces in straight lines is the same, and the belts are driven so that the upper runs move away from the hopper. Separate receiving bins 11 are positioned under the belts so as to receive the sized articles as they drop from the belts and maintain them segregated. Cushioned deflecting aprons 12 are preferably provided in symmetrical relation to and below the central belt 7 so as to break the fall of the articles.

The belts and strips 4 are supported against sagging at intervals and are also simultaneously adjusted as to their spacing by the following means:

Surrounding the belts in symmetrical but spaced relation thereto at intervals are bands 13 rigidly supported in connection with the frame work 14 of the apparatus. Each band has stems 15 slidably projecting therethrough substantially radial thereof from the opposite sides of the belts 1; said stems carrying brackets 16 on which the adjacent portions of the strips 4 and 6 are supported. A similar stem 17 depends through the band from adjacent the belt 7 and has a saddle 18 thereon for the support of the adjacent portion of said belt 7. Compression springs 19 on all the stems outwardly of the band act to pull the stems away from the center of the band.

Turnably mounted in the band is a ring 20 having on its inner periphery a number of cams 21 positioned to simultaneously engage rollers 22 or other members projecting laterally from the different stems. A handle 23 on the ring projects radially therefrom through a slot 24 in the band so that the ring may be easily turned. The cams are arranged so that when said ring is turned the belts approach or move away from each other to such an extent that the relative spacing therebetween is maintained equally at all times. There are a number of such adjusting units in the length of the belts and since each unit is adjustable independently of the others any desired angle of divergence or spacing between the belts to suit different conditions may be readily obtained as will be evident.

In operation if an article 26 being sized drops between the upper belts 1 on account of its relatively flat side being presented to the adjacent edges of said belts, said article will move down until its bottom is engaged by the lower belt 7. Since the large or full diameter of the article is then disposed vertically and is greater than the spacing between either of the belts 1 and 7, it will be held in place by said belts until, with the movement of the belts and the gradual increase in width of the spaces therebetween it reaches a point where such space is equal to or exceeds that of the large diameter of the article. At this point said article will drop through and will be received by the apron 12. The article will hold its position in engagement with one or the other of the belts 1 and the belt 7 until it is actually free and in proper position to drop through on account of the fact that all the belts are traveling at the same speed.

From the foregoing description it will be readily seen that we have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described our invention what we claim as new and useful and desire to secure by Letters Patent is:

1. A fruit and vegetable sizer comprising a pair of transversely spaced members disposed relative to each other to form a space therebetween of increasing width intermediate their ends, and a third member disposed under said pair of members in such relation thereto that the direct distance between said third member and either of the pair of members is the same as the width of the space between said pair of members in the same transverse plane and means to adjust all three of said members simultaneously to uniformly alter such direct distance between them.

2. A fruit and vegetable sizer comprising three substantially horizontal belts the upper runs of which are disposed relative to each other in a transverse plane at the apices of a triangle so that the straight line distance between the adjacent edges of adjacent belts is the same, and means to simultaneously and uniformly move all three of the belts to and from each other at will to alter the spacing thereof while maintaining its relative uniformity.

3. A fruit and vegetable sizer comprising three substantially horizontal belts, the upper runs of two of which lie in a common horizontal plane while the upper run of the other belt is disposed therebelow, and the spacing between the adjacent edges of adjacent pair of belts being the same, supporting elements for said runs of the belts, the upper belts overlapping and engaging their supporting elements so that lateral movement of the latter will impart similar movement to the belts supported thereby, and means applied to all said elements to move the same to and from each other simultaneously.

4. A fruit and vegetable sizer comprising three substantially horizontal belts the upper runs of which are disposed relative to each other in a transverse plane at the apices of a triangle supporting elements for said runs of the belts and engaging the same so that lateral movement of the elements will move said runs laterally, and means to move all said elements to and from each other simultaneously; said means comprising a fixed band through which all said belts and their supporting elements pass, stems secured to the elements and slidably projecting through the band substantially radially thereof, a ring turnably mounted in the band, cams in said ring, members projecting from the stems inside the ring, and separate cams for said members fixed in said ring and positioned for simultaneous engagement with the respective members.

5. A fruit and vegetable sizer comprising three substantially horizontal belts the upper runs of which are disposed relative to each other in a transverse plane at the apices of a triangle so that the straight line distance between adjacent edges of adjacent belts is substantially the same, each belt being mounted in a support, yieldable means normally holding the supports in fixed position, and means to simultaneously move all of said supports against the action of such yielding means to uniformly adjust the relative spacing between the belts.

6. A fruit and vegetable sizer including supports one of which is disposed in a plane between and at right angles to the others, one run of a belt in each support and movable therewith, and means to simultaneously and uniformly move all of the supports to uniformly vary the relative spacing between the belts.

7. A fruit and vegetable sizer including a frame, three pins movable axially through the frame, one pin lying in a plane between and substantially at right angles to the plane of the other pins, a support on each pin, one run of a belt movable through each support, and means to simultaneously and uniformly move all of the pins to vary the relative spacing between the belts.

8. A fruit and vegetable sizer including a frame, three pins movable axially through the frame, one pin lying in a plane between and substantially at right angles to the plane of the other pins, a support on each pin, one run of a belt movable

through each support, and springs normally holding the pins in any adjusted position.

9. A fruit and vegetable sizer including a frame, three pins movable axially through the frame, one pin lying in a plane between and substantially at right angles to the plane of the other pins, a support on each pin, one run of a belt movable through each support, an abutment on each pin, three wedge cams, and means to move the cams between the frame and abutments to move the pins and adjust the relative spacing between the belts.

10. A fruit and vegetable sizer including a frame, three pins movable axially through the frame, one pin lying in a plane between and substantially at right angles to the plane of the other pins, a support on each pin, one run of a belt movable through each support, an abutment on each pin, three wedge cams, and means to simultaneously and uniformly move the cams between the abutments and frame to move the pins and adjust the relative spacing between the belts.

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