Nov. 13, 1934. D. M. McBEAN 1,980,815

ARTICLE SORTING MACHINE

Filed Oct. 4, 1932 2 Sheets-Sheet 1

Fig. 1.

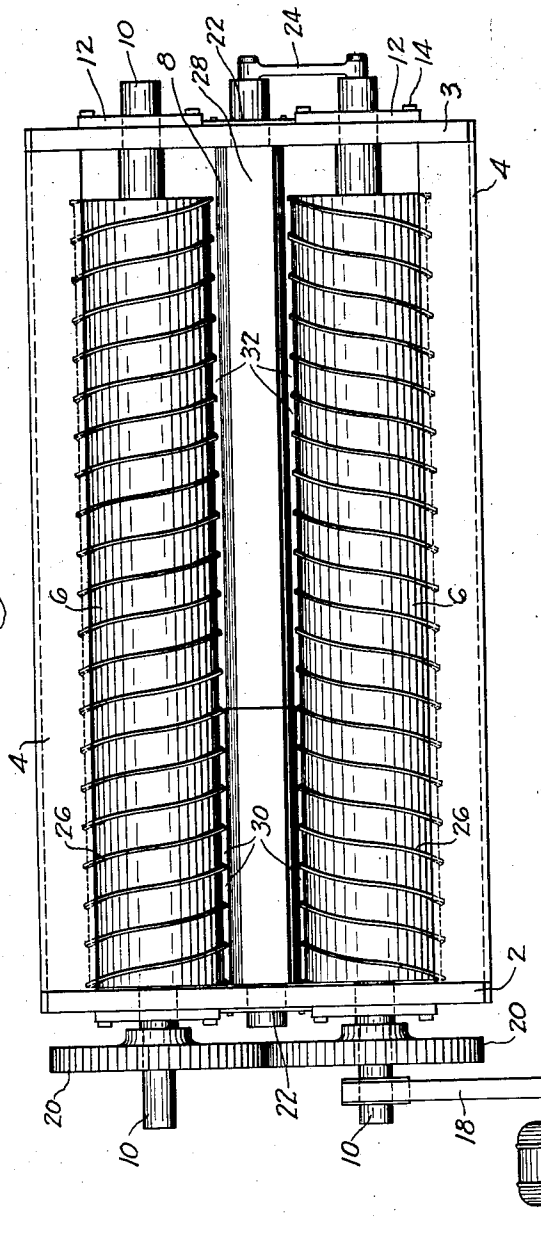
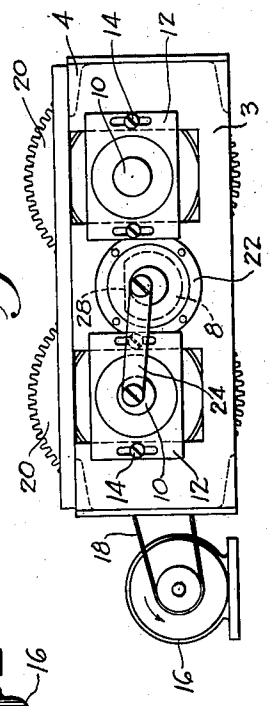


Fig. 2.



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Fig. 3.

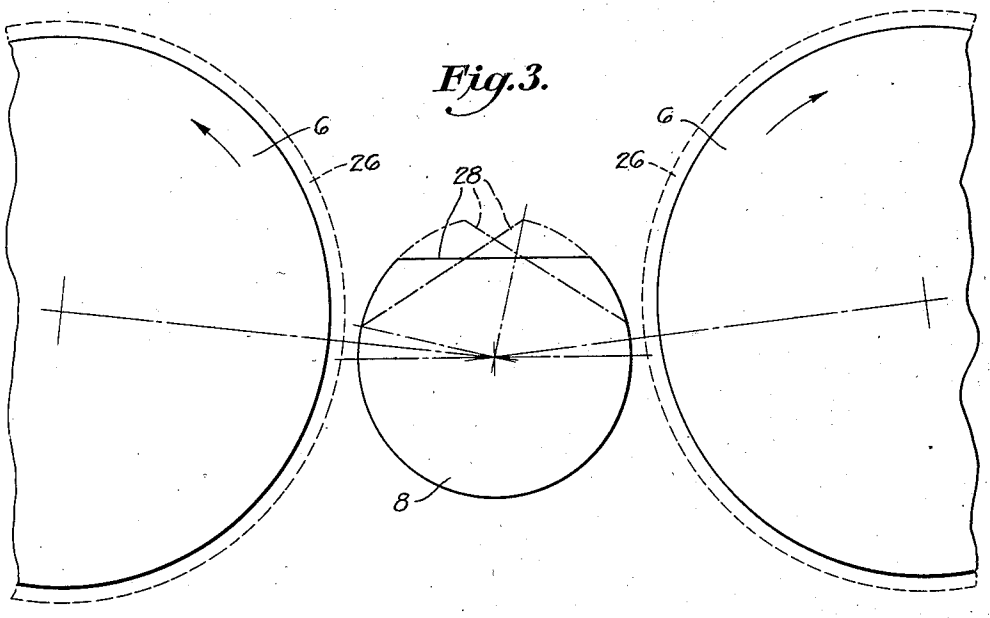
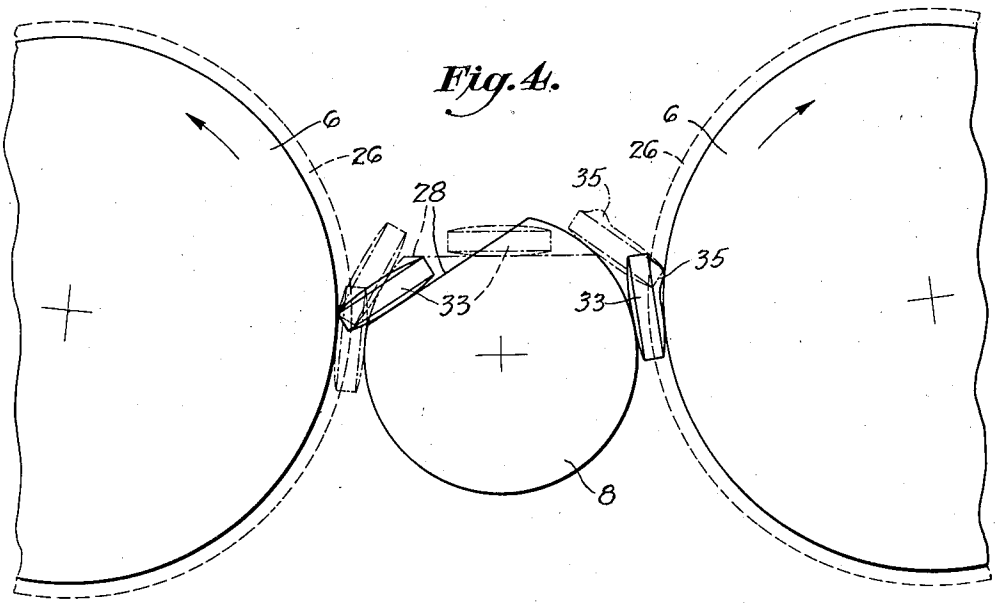


Fig. 4.



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UNITED STATES PATENT OFFICE

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ARTICLE SORTING MACHINE

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Application October 4, 1932, Serial No. 636,125

12 Claims. (Cl. 209—101)

My invention relates to machines for handling articles, and has special reference to machines for sorting disk-shaped articles such as hard candies preliminary to assembling and wrapping the articles in rolls.

One of the objects of my invention is to provide a novel and improved machine which is capable of sorting articles with respect to their thickness and evenness, and also sorting out irregular and broken pieces.

Another of the objects of my invention is to provide a machine of the character indicated which is capable of operation without subjecting the articles to sudden shocks or jars that would in the case of hard candies, such as fruit drops, be liable to result in breaking or pieces chipping off.

The several features of the invention will be readily understood from the following description and accompanying drawings, in which:

Figure 1 is a plan view of a machine embodying the features of the invention in their preferred form;

Fig. 2 is a rear end elevation of the machine; and

Figs. 3 and 4 are diagrammatical views illustrating the operation of certain parts of the machine.

The frame of the machine illustrated in the drawings is provided with front and rear end members 2 and 3 that are connected by side members 4 in the form of channel irons. Mounted between these frame members are two rolls 6 horizontally arranged side by side and spaced apart, and between these rolls is a rocking bar 8.

The rolls 6 are mounted on shafts 10 that extend through bearing blocks 12 on the end frame members 2 and 3. The bearing blocks are secured to the frame members by bolts or screws 14 which extend through slots in the blocks so as to provide for vertical adjustment of the rolls. The shaft of one of the two rolls is driven from the shaft of an electric motor 16 through a belt 18 that passes over pulleys on the motor shaft and said roll shaft. The other roll is driven through intermeshing gears 20 secured on the two roll shafts. Through this mechanism the two rolls are driven in opposite directions so as to cause the inner surface portions of both of them to travel upwardly.

The rocking bar 8 has reduced ends that extend through and are journaled in blocks 22 secured on the end frame members. The rocking bar is actuated by a rod 24 having its end pivoted on corresponding ends of the bar and one of the roll shafts 10, the pivotal connections being eccentric of the bar and shaft.

Each of the rolls is provided with a spirally arranged projecting rib 26 of a pitch slightly greater than the diameter of the articles to be acted upon, the outer peripheries of the spiral rib being arranged closely adjacent the surface of the rocking bar.

The rocking bar 8 is cylindrical except for the top portion thereof which is provided with a flat surface 28. The forward portion of this bar may be of slightly greater diameter than the remaining portion so that the spaces 30 between it and the cylindrical surfaces of the roll 6 are slightly less than the spaces 32 that are between the remaining rear portion of the bar and said cylindrical surfaces of the rolls. The axis of the rocking bar 8 is preferably spaced slightly below the plane of the axes of the rolls as indicated in Figs. 3 and 4.

In the operation of the machine, the candies or other articles 33 to be sorted are delivered in suitable quantity upon the forward end portion of the rocking bar. The rocking bar tends to move the candies first toward one of the rolls and then towards the other. As the flat surface 28 of the bar is inclined toward one of the rolls, the candies tend to slide flatwise down said flat surface so as to project the advancing end thereof into the space between the bar and the rolls. As the bar moves in the opposite direction, the flat surface tends to tilt the candies into vertical position so as to direct them edgewise down through said space. The candies, however, can pass down through said space only between the convolutions of the spiral ribs 26. The rotation of the rolls in a direction to cause their inner surface portions to travel upwardly, tends to cause the candies in contact therewith to be moved longitudinally of the rolls, and this in turn tends to work them flatwise between the convolutions of the spiral ribs.

During the passage of the candies the length of the spaces 30, those of the candies of less than standard thickness and broken pieces are permitted to pass down through the spaces 30. Those of a standard thickness or greater are conveyed by the spirally ribbed rolls to the rear portion of the bar, and as they pass along this portion any candies of said standard thickness work down through the spaces 32. Those candies of greater than said standard thickness or those that are provided with projections such as indicated at 35, being incapable of passing through the spaces

32, are carried by the spiral ribs to the rear ends of the rolls from which they are discharged.

Any convenient means such as conveyor belts (not shown) may be provided for separately receiving the pieces that drop from the spaces 30, the spaces 32, and the rear ends of the rolls.

Thus as the candies pass through the machine, those candies of standard thickness and free from projections, are separated from the others as they pass down through the spaces 32, and are then ready to be assembled in rolls in the usual manner and wrapped.

It will be apparent that by operating the machine at a suitable speed, the candies may be sorted out as above described without subjecting them to shock or jar that would be likely to cause them to break or pieces chip off.

The machine may be easily adjusted for candies or other articles of different thicknesses by vertical adjustment of the rolls 6 as above described, so as to vary the spaces between the rolls and the rocking bar.

As will be evident to those skilled in the art, my invention permits various modifications without departing from the spirit thereof or the scope of the appended claims.

What I claim is:

1. In a machine for handling disk-shaped articles of the class described, two rolls horizontally arranged side by side and spaced apart, a rocking bar arranged between the rolls having cylindrical surface portions respectively spaced predetermined distances from the cylindrical surfaces of the rolls, means for rotating the rolls in opposite directions so as to cause their inner surface portions to travel upwardly, and means for oscillating the bar in timed relation thereto.

2. In a machine for handling disk-shaped articles of the class described, two rolls horizontally arranged side by side and spaced apart, a cylindrical rocking bar arranged between the rolls having its cylindrical surface spaced predetermined distances from the cylindrical surfaces of the rolls, said bar having its top portion flattened, means for rotating the rolls in opposite directions so as to cause their inner surface portions to travel upwardly, and means for oscillating the bar in timed relation thereto.

3. In a machine for handling disk-shaped articles of the class described, two rolls horizontally arranged side by side and spaced apart, a rocking bar arranged between the rolls having cylindrical surface portions respectively spaced predetermined distances from the cylindrical surfaces of the rolls, the axis of the rocking bar being spaced slightly below the plane of the axes of the rolls, means for rotating the rolls in opposite directions so as to cause their inner surface portions to travel upwardly, and means for oscillating the bar in timed relation thereto.

4. In a machine for handling disk-shaped articles of the class described, two rolls horizontally arranged side by side and spaced apart, a rocking bar arranged between the rolls having cylindrical surface portions respectively spaced predetermined distances from the cylindrical surfaces of the rolls, means for rotating the rolls in opposite directions so as to cause their inner surface portions to travel upwardly, means for oscillating the bar in timed relation thereto, said rolls and bar being adapted to be relatively adjusted vertically to vary the spaces between said cylindrical portions and the cylindrical surfaces of the roll.

5. In a machine for handling disk-shaped articles of the class described, two rolls arranged side by side and spaced apart, a rocking bar arranged between the rolls having a plurality of longitudinal portions having cylindrical surface portions spaced different distance from the cylindrical surfaces of the rolls, means for rotating the rolls in opposite directions so as to cause their inner surface portions to travel upwardly, and means for oscillating the bar in timed relation thereto.

6. In a machine for handling disk-shaped articles of the class described, two rolls horizontally arranged side by side and spaced apart, a rocking bar arranged between the rolls having cylindrical surface portions spaced predetermined distances from the cylindrical surfaces of the rolls, means for rotating the rolls in opposite directions so as to cause their inner surface portions to travel upwardly, and means for oscillating the rocking bar in timed relation thereto, said rolls having provision of means tending to cause articles entering the spaces between the rolls and the rocking bar to travel longitudinally of the rolls.

7. In a machine for handling disk-shaped articles of the class described, two rolls horizontally arranged side by side and spaced apart, a rocking bar arranged between the rolls having cylindrical surface portions spaced predetermined distances from the cylindrical surfaces of the rolls means for rotating the rolls in opposite directions so as to cause their inner surface portions to travel upwardly, and means for oscillating the bar in timed relation thereto, said rolls having provision of means tending to cause articles entering the spaces between the rolls and the rocking bar to travel longitudinally of the rolls, said last-mentioned means comprising spirally arranged ribs on the rolls.

8. In a machine for handling disk-shaped articles of the class described, a roll horizontally arranged, a rocking bar arranged parallel with the roll having a cylindrical surface portion spaced a predetermined distance from the cylindrical surface of the roll, means for continuously rotating the roll in a direction so as to cause the surface portion thereof adjacent the rocking bar to travel upwardly, and means for oscillating the rocking bar in timed relation thereto.

9. In a machine for handling disk-shaped articles of the class described, a roll horizontally arranged, a rocking bar arranged parallel with the roll having a cylindrical surface portion spaced a predetermined distance from the cylindrical surface of the roll, means for rotating the roll in a direction so as to cause the surface portion thereof adjacent the rocking bar to travel upwardly, and means for oscillating the rocking bar in timed relation thereto, said roll having a spirally arranged rib of a pitch slightly greater than the width of the articles, and said rib extending into said space.

10. In a machine for handling disk-shaped articles of the class described, a roll horizontally arranged, a rocking bar arranged parallel with the roll having a cylindrical surface portion spaced a predetermined distance from the cylindrical surface of the roll, means for continuously rotating the roll in a direction so as to cause the surface portion thereof adjacent the rocking bar to travel upwardly, and means for oscillating the bar in timed relation thereto, said roll having provision of means tending to cause the articles entering the spaces between the bar and the roll to travel in one direction longitudinally of the roll.

11. In a machine for handling disk-shaped articles of the class described, two rolls horizontally arranged side by side and spaced apart, each of the rolls having a spirally arranged rib of a pitch slightly greater than the diameter of the articles to be acted upon, a cylindrical rocking bar arranged between and spaced a predetermined distance from the cylindrical surface of the rolls, said rocking bar having its top surface flat, means for rotating the rolls in opposite directions so as to cause their inner surface portions to travel upwardly, and means for oscillating the bar in timed relation thereto.

12. In a machine for handling disk-shaped articles of the class described, two rolls horizontally arranged with their axes parallel, a rocking bar positioned between the rolls and having cylindrical surface portions spaced predetermined distances from the cylindrical surface of the rolls, means for rotating said rolls in opposite directions and means for rocking said bar in timed relation thereto, said bar and said rolls being so relatively positioned and said bar having its top portion so shaped as to cause the disk-shaped articles when delivered thereto to be fed endwise, upon rocking of the bar, to the space between the bar and the rolls and to cooperate with the cylindrical surface of the rolls to turn the articles and cause the same to pass edgewise through said space.

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