Sept. 23, 1952 H. W. SAWYER ET AL 2,611,484

ARTICLE SORTING DEVICE

Filed Jan. 18, 1951 3 Sheets-Sheet 1

Fig. 1

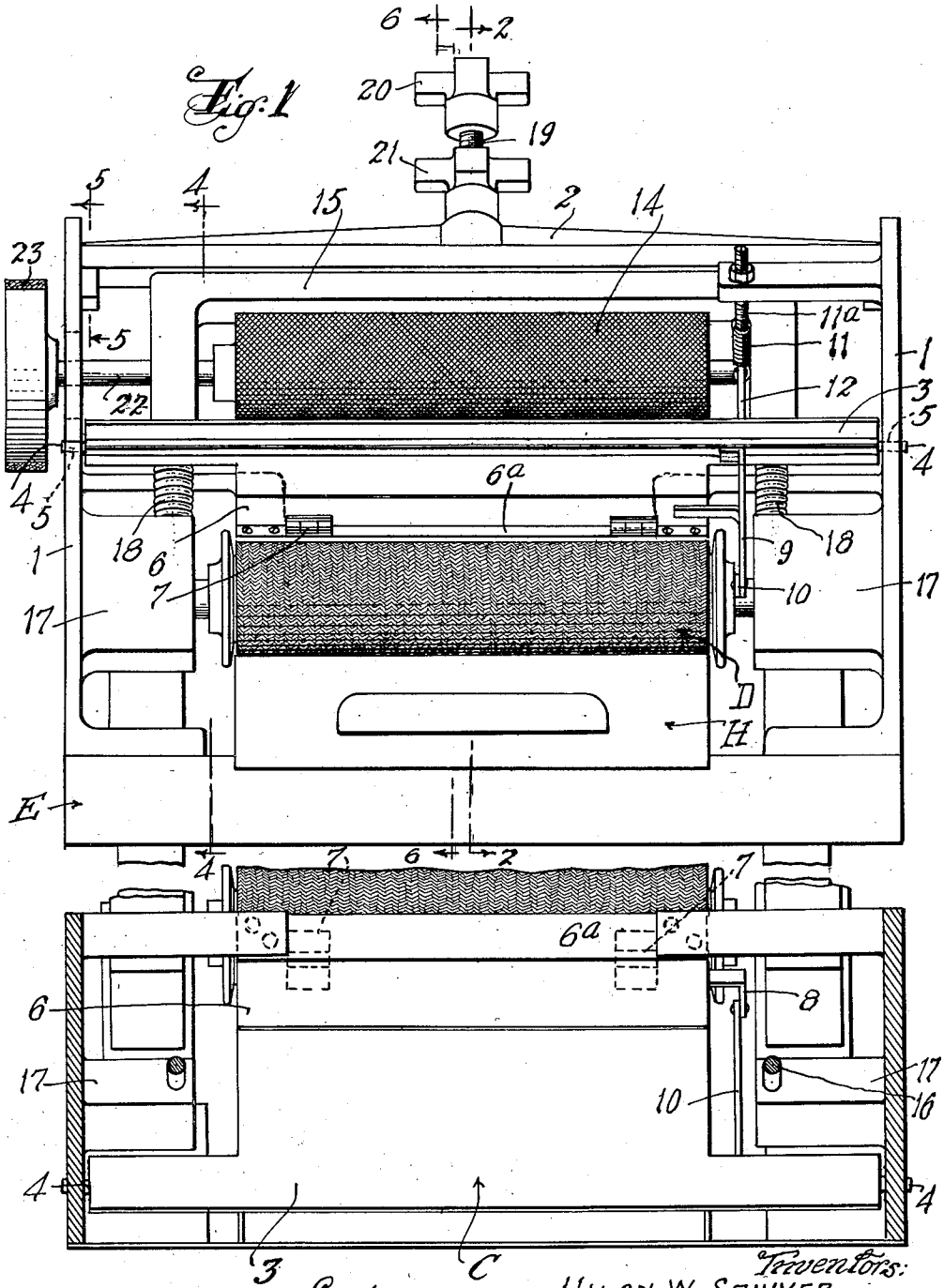


Fig. 3

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Sept. 23, 1952 H. W. SAWYER ET AL 2,611,484

ARTICLE SORTING DEVICE

Filed Jan. 18, 1951 3 Sheets-Sheet 2

Fig. 2

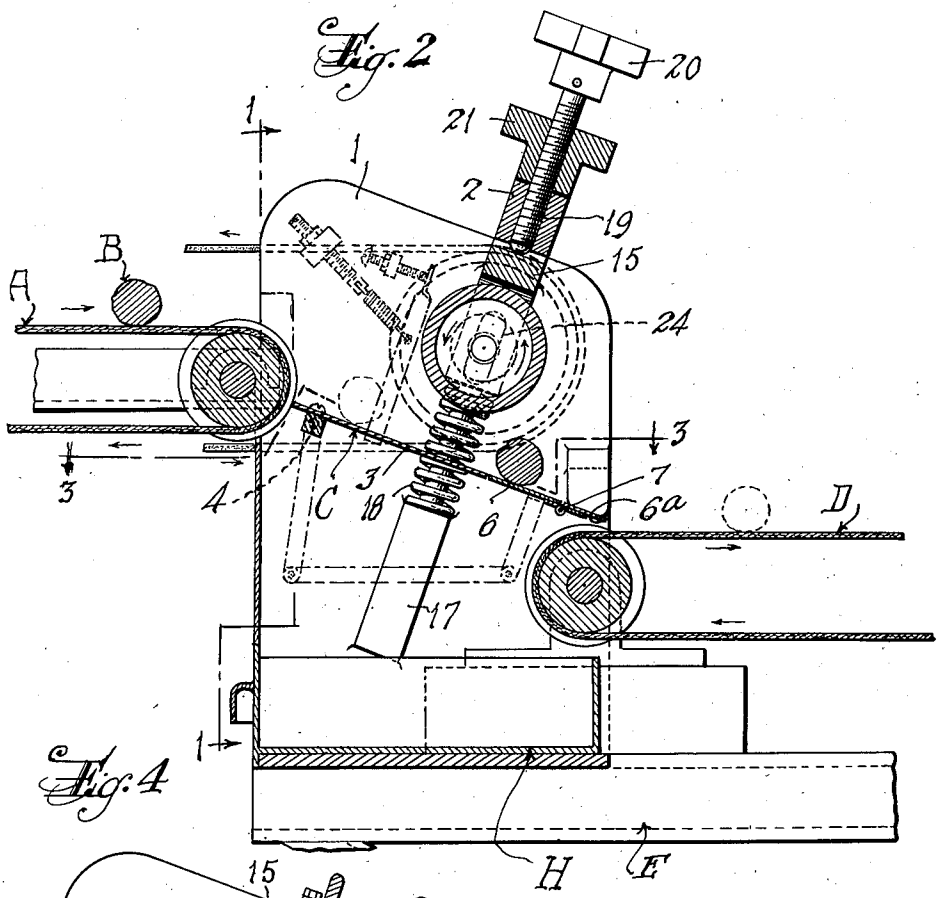


Fig. 4

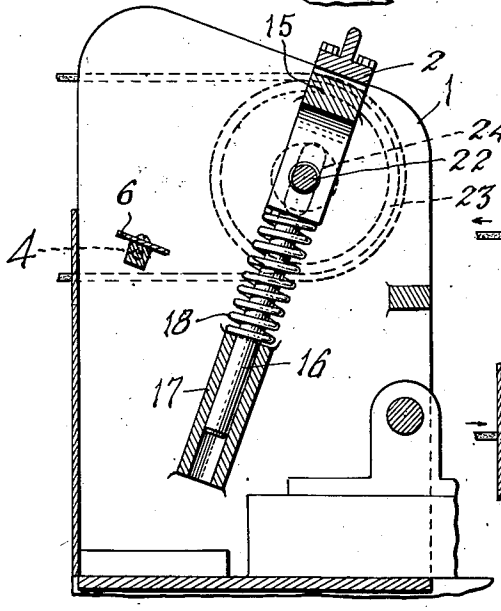
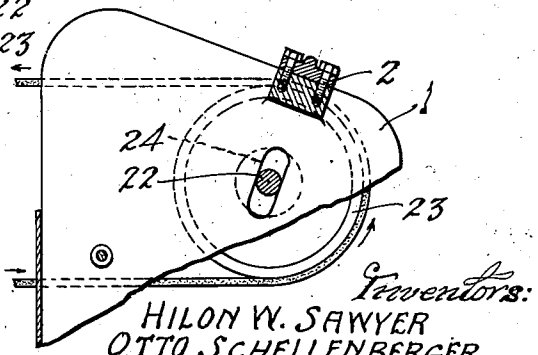


Fig. 5



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ARTICLE SORTING DEVICE

Filed Jan. 18, 1951 3 Sheets-Sheet 3

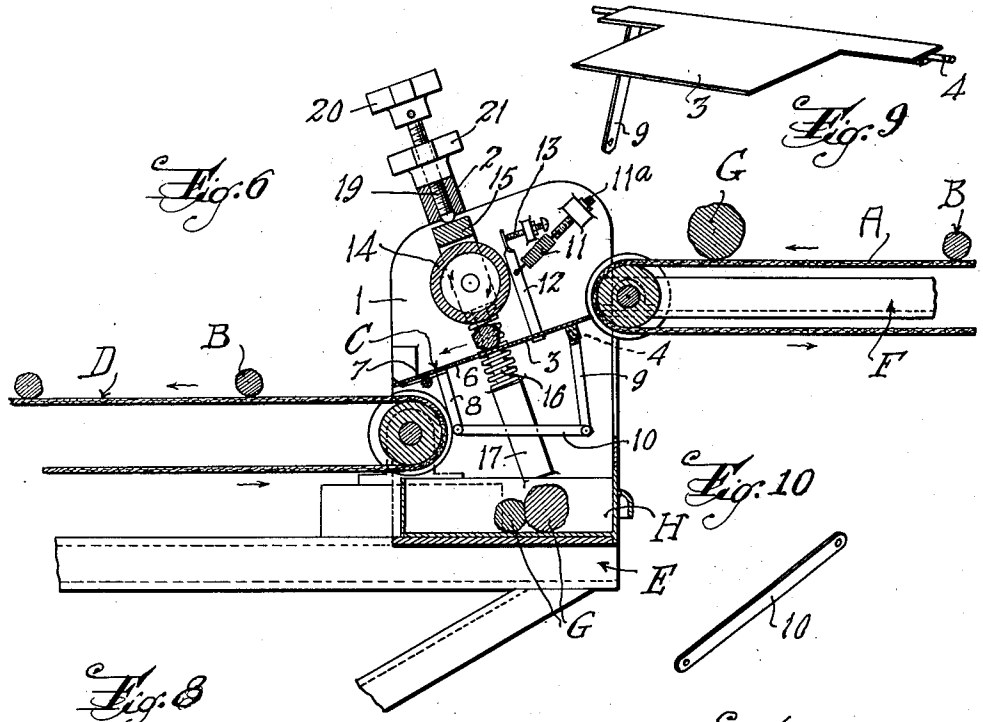


Fig. 6

Fig. 9

Fig. 10

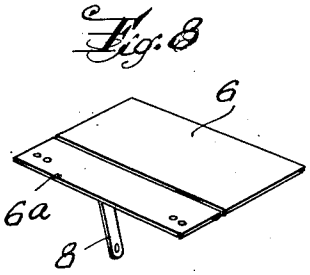


Fig. 8

Fig. 7

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UNITED STATES PATENT OFFICE

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ARTICLE SORTING DEVICE

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Application January 18, 1951, Serial No. 206,662

6 Claims. (Cl. 209—121)

1

In the handling of rolls or loaves of dough, for example, in panning the rolls, sometimes two of the rolls become stuck together, forming a so-called double, which, if it is not removed from the machine, interferes with the handling of subsequent rolls; and the present invention relates particularly to mechanism for eliminating or ejecting such doubles from the dough-handling machine.

It is, of course, desirable that the dough rolls be handled as rapidly as possible to insure economical operation of the machine, and obviously, if the rolls are to be passed through the machine at a high rate of speed, for example, 180 per minute, it is necessary that the doubles be rapidly, if not almost instantaneously, disposed of. Therefore, a prime object of the present invention is to provide novel and improved means for eliminating or ejecting doubles from dough-handling machines rapidly and reliably.

The invention contemplates a doubles eliminating mechanism wherein the dough rolls shall be caused to move over a guide surface or table comprising a plurality of sections relatively movably mounted so that when a double rolls over the table, said sections shall be automatically actuated to provide an opening between them through which the double may be ejected, the sections being so connected that they shall be simultaneously moved to form said opening for passage of the double almost instantaneously.

The table sections are mounted and connected so that they will remain in the same plane and permit free movement of a normal roll thereover but will be actuated automatically by the excess weight of a double to form the discharge opening for the double. But another object of the invention is to provide additional means for accelerating the actuation of the table sections and the movement of the double between said sections.

Other objects, advantages and results of the invention will be brought out by the following description in conjunction with the accompanying drawings, in which

Figure 1 is a front elevational view of a dough-handling machine embodying the invention, taken approximately on the plane of the line 1—1 of Figure 2 with the roll feeding conveyor omitted.

Figure 2 is a longitudinal vertical sectional view approximately on the plane of the line 2—2 of Figure 1 with one of the endless conveyors omitted for clearness in illustration.

Figure 3 is a horizontal sectional view approximately on the plane of the line 3—3 of Figure 2.

Figure 4 is a transverse vertical sectional view on a reduced scale approximately on the plane of the line 4—4 of Figure 1.

2

Figure 5 is a fragmentary vertical sectional view approximately on the plane of the line 5—5 of Figure 1.

Figure 6 is a longitudinal vertical sectional view approximately on the plane of the line 6—6 of Figure 1 showing parts of the machine in the positions assumed during operation with normal rolls.

Figure 7 is a similar view showing the parts of the doubles eliminating mechanism in the position assumed during the ejection of a double.

Figure 8 is a detached perspective view of portions of the table of the dough eliminating mechanism.

Figure 9 is a similar view of the other portions of the table, and

Figure 10 is a detached perspective view of the link for connecting the two relatively movable table sections.

Specifically describing the illustrated embodiment of the invention, the machine includes a roll feeding conveyor A which comprises an endless canvas belt driven in any suitable manner so as to feed dough rolls B to the table C of the doubles eliminating mechanism embodying the invention from which the rolls are discharged by gravity onto a takeaway or transfer conveyor D which may be like the conveyor A. These conveyors and the doubles eliminating mechanism will be mounted on a suitable framework or support, only portions E and F of which are shown.

The doubles eliminating mechanism includes a frame comprising two side pieces 1 that are connected by a top bar 2, said side pieces being mounted on the portion E of the main support. The doubles eliminating table C comprises a section 3 that has pivot trunnions 4 mounted in openings 5 in the side pieces 1, and another section 6 normally mounted in the same plane with the section 3 and hingedly connected at 7 to a crossbar 6a mounted on the side pieces 1. The two table sections 3 and 6 are inclined from the discharge end of the feeding conveyor A to a point above the receiving end of the transfer conveyor D and are adapted to receive the rolls B at the higher edge thereof, the rolls being deposited on the table C from the feeding conveyor.

The two sections 3 and 6 are connected together and mounted on the side pieces 1 so that normally they will remain in a common inclined plane and permit the normal rolls B to roll thereover, as shown in Figures 2 and 6, but to swing relatively to each other when an abnormal or double roll G having excess weight, drops onto the table section 3, as shown in Figure 7, so as to form a discharge opening J between the ad-

jacent edges of the table sections through which the double may drop by gravity into a receiving drawer or other suitable receptacle H, as shown. The sections are so connected and mounted that simultaneously the section 3 will swing downwardly and the section 6 will swing upwardly, as shown in Figure 7, the connection between the sections comprising an arm 8 on the section 6 and an arm 9 on the section 3, and a link 10 pivotally connecting said arms. A tension spring 11 is connected to an arm 12 on the section 3 so as normally to hold the table sections in their common plane, a stop screw 13 being mounted in one of the side pieces 1 to be engaged by said arm 12 for limiting the movement of the table sections under the influence of said spring. The tension of the spring 11 is adjustable by the screw 11a to set the table sections for tilting under rolls of different weights.

As heretofore stated, it is desirable that the rolls be fed or conveyed at a high rate of speed, for example, 180 per minute, and the invention contemplates novel means for accelerating the relative movement of the table sections 3 and 6 to insure that the doubles shall be almost instantaneously ejected through the discharge opening J.

This means is shown as comprising a knurled roller 14 which is journalled in a yoke 15 which, in turn, is mounted on slide guide rods 16 in guide cheeks 17 on the side pieces 1, springs 18 normally holding the yoke at its upper position in engagement with a stop screw 19 and with the periphery of the roll 14 spaced from the table sections a distance slightly greater than the diameter of a normal dough roll B. The stop screw 19 is screwed in the top bar 2 and has a handle 20 for convenient adjustment to set the roller 14 in the desired spaced relation to the table C. A lock nut 21 is provided for holding the screw in adjusted positions.

The roller 14 is driven at high speed, for example, 400 R. P. M., in the direction of the arrows so that when the periphery of the roller engages a double, it will propel the roll through the discharge opening J, as shown in Figure 7. The roller may be driven by any suitable means but it is shown as carried by a shaft 22 which is journalled in the yoke 15 and passes through slots 24 in the side pieces 1, and has a belt and pulley connection 23 with any suitable source of power.

In operation of the machine, dough rolls of normal diameter will freely roll over the table C from the feeding conveyor A to the transfer conveyor D, but when a dough roll of greater than normal diameter or weight, for example, a double, reaches the periphery of the roller 14, gravity and the roller will simultaneously act upon the dough roll to almost instantaneously swing the table sections 3 and 6 relative to each other to form the discharge opening J and at the same time flip the dough roll quickly through the discharge opening into the receptacle H. This operation is extremely rapid and has been found to take care of doubles when the rolls are being fed at a rate of 180 per minute, which is a striking result when compared with the operation of doubles eliminators heretofore known to us.

While we have shown and described the invention as embodied in certain structural details, it will be understood that this is primarily for the purpose of illustrating the now preferred form of the invention and that many modifications

and changes may be made in the construction of the machine and the adaptation of the doubles eliminator mechanism to other types of article handling machines within the spirit and scope of the invention. For example, while preferably the table sections 3 and 6 are arranged so that the lower section 6 swings upwardly and the upper section swings downwardly, the sections might be arranged to move in other ways to form the discharge opening between the adjacent edges thereof.

We claim:

1. The combination of a support, a table comprising at least two sections normaly disposed in edge to edge relation in a common plane and relatively movably mounted on said support so that the adjacent edge portions thereof can move simultaneously in opposite directions out of said plane to form an opening between them for ejection of certain articles from the table, mechanism holding said table sections in said common plane so that articles of predetermined size may roll completely across the table in a direction transverse of said edges of the sections and providing for said relative movement of said sections upon movement of larger articles onto said table to cause ejection of said larger articles through said opening between said sections, a roller journaled on said support parallel to and above said table with its periphery spaced from the table a distance greater and less than the diameters of the first-mentioned articles and said larger articles respectively, and means for rotating said roller so that the larger articles will be engaged by the periphery of the roller and projected thereby through said discharge opening.

2. The combination of a support, a table comprising at least two sections normally disposed in edge to edge relation in a common plane and relatively movably mounted on said support so that the adjacent edge portions thereof can move simultaneously in opposite directions out of said plane to form an opening between them for ejection of certain articles from the table, mechanism holding said table sections in said common plane so that articles of predetermined size may roll completely across the table in a direction transverse of said edges of the sections and providing for said relative movement of said sections upon movement of larger articles onto said table to cause ejection of said larger articles through said opening between said sections, said table sections being hingedly mounted on said support in an inclined plane to cause movement of said articles by gravity over the table, and the upper table section being swingable downwardly out of said plane, a roller journaled on said support parallel to and above said table with its periphery spaced from the table a distance greater and less than the diameters of the first-mentioned articles and said larger articles respectively, and means for rotating said roller so that the larger articles will be engaged by the periphery of the roller and projected thereby through said discharge opening.

3. The combination of a support, a table comprising at least two sections normally disposed in edge to edge relation in a common plane and relatively movably mounted on said support so that the adjacent edge portions thereof can move simultaneously in opposite directions out of said plane to form an opening between them for ejection of certain articles from the table, mechanism holding said table sections in said common plane so that articles of predetermined size may roll completely across the table in a direction

transverse of said edges of the sections and providing for said relative movement of said sections upon movement of larger articles onto said table to cause ejection of said larger articles through said opening between said sections, said mechanism including a connection between said sections to cause simultaneous movement thereof and means yieldingly resisting said movement of one of said table sections out of said plane, a roller journaled on said support parallel to and above said table with its periphery spaced from the table a distance greater and less than the diameters of the first-mentioned articles and said larger articles respectively, and means for rotating said roller so that the larger articles will be engaged by the periphery of the roller and projected thereby through said discharge opening.

4. The combination of a support, a table comprising at least two sections normally disposed in edge to edge relation in a common plane and relatively movably mounted on said support so that the adjacent edge portions thereof can move simultaneously in opposite directions out of said plane to form an opening between them for ejection of certain articles from the table, mechanism holding said table sections in said common plane so that articles of predetermined size may roll completely across the table in a direction transverse of said edges of the sections and providing for said relative movement of said sections upon movement of larger articles onto said table to cause ejection of said larger articles through said opening between said sections, said table sections being hingedly mounted on said support in an inclined plane to cause movement of said articles by gravity over the table, and the upper table section being swingable downwardly out of said plane, and said mechanism comprising an arm rigidly connected to each table section, a link pivotally connecting said arms, and means yieldingly resisting said movement of one of said table sections.

5. The combination of a support, a table comprising at least two sections normally disposed in edge to edge relation in a common plane and relatively movably mounted on said support so that the adjacent edge portions thereof can move simultaneously in opposite directions out of said plane to form an opening between them for

ejection of certain articles from the table, mechanism holding said table sections in said common plane so that articles of predetermined size may roll completely across the table in a direction transverse of said edges of the sections and providing for said relative movement of said sections upon movement of larger articles onto said table to cause ejection of said larger articles through said opening between said sections, said table sections being hingedly mounted on said support in an inclined plane to cause movement of said articles by gravity over the table, and the upper table section being swingable downwardly out of said plane, and said mechanism comprising an arm rigidly connected to each table section, a link pivotally connecting said arms, a second arm on one of said table sections, a spring having one end connected to said second arm, means connecting the other end of said spring to said support, whereby one of said table sections is normally actuated by said spring in the direction opposite to the direction of said movement out of said plane, and stop means for limiting movement of said section by said spring to locate said section normally in said plane.

6. The combination as defined in claim 5 with addition of a roller journaled on said support parallel to and above said table with its periphery spaced from the table a distance greater and less than the diameters of said first-mentioned articles and said larger articles respectively, and means for rotating said roller so that the larger articles will be engaged by the periphery of the roller and projected thereby through said discharge opening.

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