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R. J. SHOLTZ

PACKAGE SORTER

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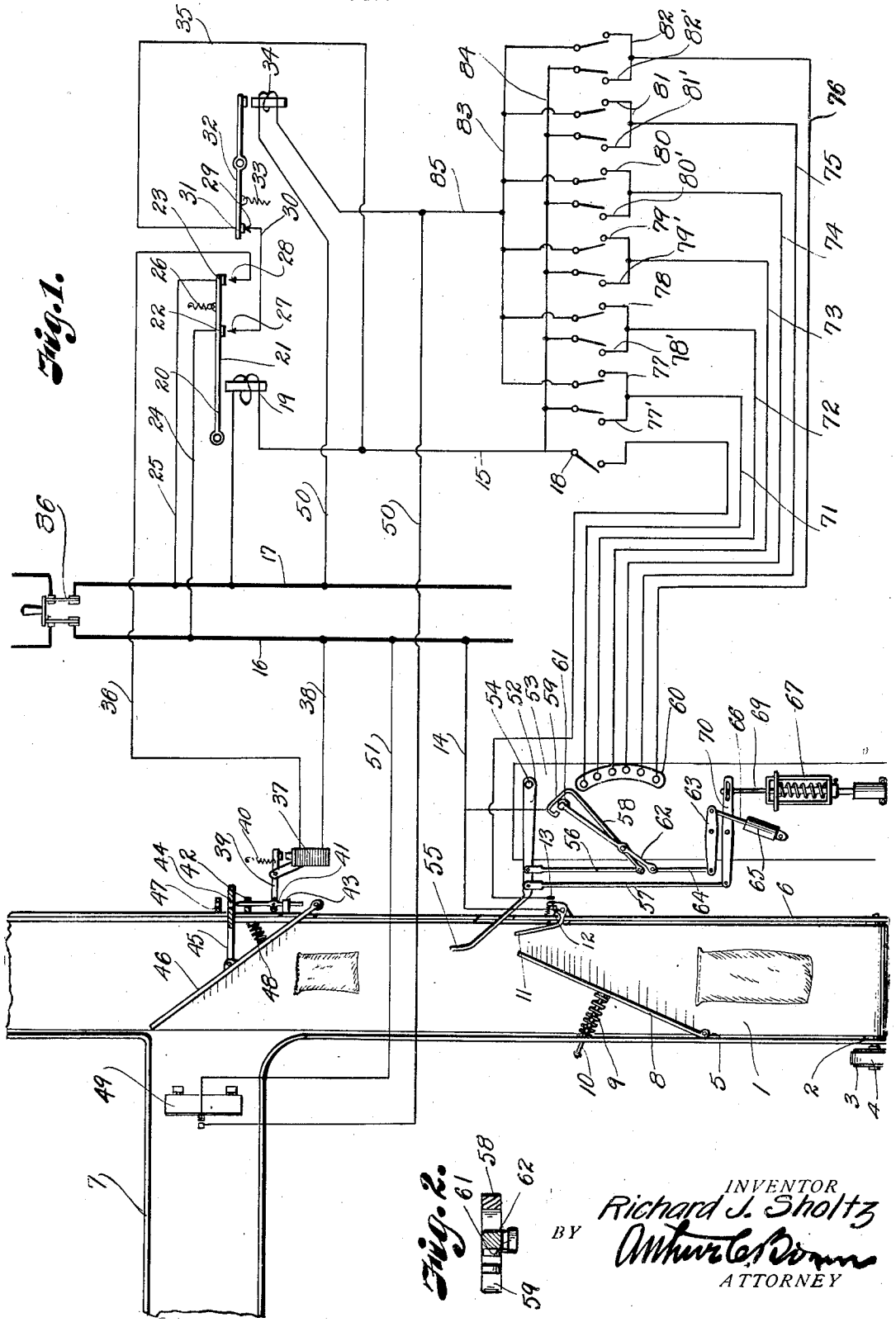


Fig. 1.

Fig. 2.

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RICHARD J. SHOLTZ, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-THIRD TO EMANUEL M. RÁCZ AND ONE-THIRD TO CLARENCE M. HARDENBERGH, BOTH OF KANSAS CITY, MISSOURI.

PACKAGE SORTER.

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To all whom it may concern:

Be it known that I, RICHARD J. SHOLTZ, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Package Sorters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to sorting apparatus and it particularly contemplates the provision of means for segregating articles or packages so that all those approximating a certain size or weight, or any predetermined number of certain sizes or weights, may be diverted into a single channel. For example, in flour mills the flour is put up in bags containing 6 pounds, 12 pounds, 24 pounds, 48 pounds, 96 pounds, 140 pounds and 200 pounds. If it is desired to group the packages of any particular denomination, such as in loading cars or loading a dock preparatory to shipment, considerable time and labor will be consumed in separating the bags or packages from the heterogeneous group unless some means is provided for automatically effecting the separation. I have provided a novel means whereby the separation may be accomplished and while the invention is particularly designed for use in flour mills, it is obvious that in its generic aspect it is susceptible for uses other than those encountered in a flour mill, so in so far as the generic conception of my invention is involved I wish it to be understood that the invention contemplates the application wherever the broad principle may be put into use.

The broad embodiment of my invention as well as the novel details of construction of the preferred embodiment of my invention will be clearly understood by reference to the following description in connection with the accompanying drawings, in which

Fig. 1 is a diagrammatic view of the preferred embodiment of a sorter constructed in accordance with my invention, and

Fig. 2 is a sectional view of the contacts for the compensating mechanism.

Referring now to the drawings by numerals, 1 designates a charger belt onto which the articles to be sorted may be delivered either manually or mechanically. The charger belt is driven by suitable mechanism diagrammatically shown as a roller 2 having a pulley 3 rigid therewith to receive motion from a belt 4 deriving its motion from a suitable source not shown. The charger belt or movable table runs between the two upright sides 5 and 6 of a guideway and at suitable intervals I provide one or more intersecting chutes 7, there being only one shown. It is to be understood however that additional intersecting guideways or chutes may be employed wherever necessary.

Secured to one of the side walls of the guideway is an article guide or directing plate 8 urged diagonally across the path of the charger belt or guideway, the plate being urged into diagonal position by the expansion spring 9 which is coiled about the rod 10, one end of which is connected to the plate 8 and the other end of which extends through the side wall 5. Therefore as the articles pass along the guideway they will be deflected over toward the wall 6 to contact with a feeler finger 11 pivoted to the wall 6 and carrying a contact 12 which, when the feeler-finger 11 moves over to the side of the wall 6, will contact with a fixed contact 13 to close an electrical circuit consisting of the conductors 14 and 15, electrically connected to the main electrical line consisting of the conductors 16 and 17. In the circuit consisting of the conductors 14 and 15, and more specifically in the conductor 15, is a switch 18 and a magnet coil 19, the magnet being effective to attract the armature 20 of the circuit closing relay 21. The circuit closing relay has two contact points 22 and 23, in electrical connection with the conductors 16 and 17 through the wires 24 and 25. The relay is normally urged into open position by the spring 26. When the circuit consisting of the conductors 14 and 15 and the feeler-finger contacts, 12 and 13 is closed, the magnet 19 will draw down the armature 20 so that the contacts 22 and 23

will contact with the fixed contacts 27 and 28. The fixed contact 27 is connected separately to the fixed contact 29 by a wire 30 and it is adapted to close a circuit with a contact 31 on the pivoted circuit closing relay arm 32, normally closed by a spring 33 but adapted to be operated to break the contacts 29 and 31 when the coil 34 is energized through a circuit to be hereinafter referred to. When the contacts 29 and 31 are together the current will flow through wire 24, through wire 30, through contact 29, contact 31 through wire 35 to conductor 15 to coil 19. When the contacts 23 and 28 are together, as they will be together when contacts 22 and 27 are together, the current will flow from the main line 17 through wire 25, through contacts 23 and 28, through wire 36 to the magnet coil 37, back to conductor 16, through wire 38 to cause the magnet 37 to oppose the spring 40 and draw the armature 39 to the magnet coil 37, inducing a longitudinal movement to the detent pin 41 in the guides 42 and 43 so that the pin will pass through an opening 44 in the latch bar 45 pivoted to the pivoted plate 46, the pin having movement enough to pass through opening 44 of the latch bar to perforate keeper-lug 47 so that the plate 46 will be held rigid, for otherwise the weight of the package would swing the pivoted plate 46 against the spring 48 and compress it enough, to allow the article or package to proceed along a straight line.

When the deflecting plate or gate 46 is held rigid by the pin or detent 41 the article will be deflected toward the off-chute or guideway 7, as it passes into the off-chute or guideway 7 it will operate a switch 49 to operate the normally closed circuit breaker 32 to break the contact between the two conductors 35 and 30. The conductor 50 includes the magnet coil 34 under one end of the pivoted lever 32 and it is connected to the main line conductor 17. The conductor 51 is connected directly to the main line conductor 16. As soon as the contacts 29 and 31 are broken the current will cease to be supplied to the magnet coil 19 so the spring 26 will pull the armature 20 off the contacts 27 and 28 so that there will be no current flowing through any of the circuits.

As heretofore explained there may be any number of off-chutes 7. Each off-chute will divert a bag or article having a given weight so some means must be provided for insuring all articles of a given weight, entering into the off-chute or guideway selected to receive them. In order to be sure that the proper articles or bags, as the case may be, are diverted to the proper chutes or guideways I provide a selector mechanism. The selector mechanism is shown as comprising a selector arm 52 pivoted to a support 53 at 54 and having a finger 55 which extends inwardly over the table or belt in the path of the bags or articles, adjacent to the feeler-finger 11. The arm 52 is connected to two links 56 and 57. The link 56 is connected to a pivoted contact arm 58 having a hooked end 59 electrically connected to the conductor 14. The hooked end 59 is in a different plane than the plane of the segmental contact bar 60 but it is adapted to contact with a contact 61 movable over the contact 60. The contact 61 is carried by a pivoted lever 62, connected to a pivoted lever 63 by a link 64. The lever 64 is connected to a spring actuated dash-pot 65 of usual construction by a link 66. The arm 52 is also connected to a spring compensating device 67 by a link 69 through a pivoted lever 70 which in turn is connected to the link 57. By referring to the drawings it will be seen that the selector mechanism has compensating members which, when the articles strike the finger 55, will cause relative movement between the hooked end 59 and the contact 61 so that initially the hooked end 59 and the contact 61 will come together, then as the two move over the segment bar 60 current will flow into the wire 71, wire 72, wire 73, wire 74, wire 75 or wire 76 dependent upon which of the switches, 77, 77′, 78, 78′, 79, 79′, 80, 80′, 81, 81′, 82, or 82′ is closed and if the selected switch is closed then the gate 46 will be locked only when current passes through the circuit having a closed switch 77′ to 82′ respectively. It will be observed that the switch bus-bar 83 is provided for the switches 77 to 82 and the bus-bar 84 is provided for the single throw switches 77′ to 82′ respectively. The bus-bar 83 is connected to the conductor 50 through a wire 85 and the bus-bar 84 is connected to the conductor 15.

The dash pot 65 is used in connection with the rod on the end of lever 63 so that the lever 62 will swing on its pivot at a relatively low rate of speed, slower than the lever 58 which is connected to lever 52 by a link 56. The lever 52 is connected to lever 70 by a link 57. The spring 67 will put under compression when the bag hits finger 55. When the bag hits finger 55 the hooked end 59 will contact with 61. As soon as the bag passes 55, pressure against finger 55 will be released. The spring 66 being freer to expand than the spring in dash-pot 65, will cause 59 to move away from 61 faster than the movement of 61, so the contact will be broken.

Suppose the parts are assembled as shown and it is desired to divert bags containing 24 pounds of flour through the off-chute 7. In this event the switch 78′ only will be closed, all others will be open. The im-

pact and friction of bags containing 6 pounds or 12 pounds of flour will not be sufficient to move the contact 61 to the contact for wire 72 on the segment 60 so these bags will flow past the finger 55, strike the gate 46 and pass on. Bags containing 48, 98, 140 or 200 pounds of flour will swing the arm 52 far enough, on account of the impact generated by their weight and the friction against the members 11 and 55, to move the contact 61 beyond the contact on segment 60 for wire 72, and since the switches 79, 80, 81 and 82 are closed and the switches 79′, 80′, 81′, and 82′ are open the current from lines 73, 74, 75 and 76 will flow through the bus-bar 83, line 85 energizing the magnet 34 to break the circuit which controls the pivoted plate 46, being free to swing back, permitting the passage of these bags past the chute 7. But, when a 24 pound sack of flour strikes finger 55 the contact 61 will move over to the contact on segment 60 for wire 72 then the current can flow through the circuits to cause the magnet 19 to attract the armature 20 and allow bolt 41 to enter the keeper-lug 47 to lock the gate 46. In its locked position the bag will be diverted into the off-chute 7 but just as soon as it passes over the switch 49 the circuit through wires 50 and 51 and the magnet 34 will be energized and the armature 32 will be drawn down so as to break the circuit through conductors 35, 30 and 24, thereby restoring all of the apparatus to its normal position.

Suppose it is desired to divert bags containing 12 pounds and 48 pounds through the off-chute 7, then the switches 77′, 79′, 78, 80, 81 and 82 will be closed. Bags containing either 12 or 48 pounds will cause the operation of the device, all other bags will pass by because, ever though they operate finger 55, the contacts will be made for the circuit 50 which breaks the circuit to the magnet 37 and current cannot flow through the magnet 19, therefore the device will operate only to permit bags containing 12 or 48 pounds to pass into the off-chute 7. It will be apparent that when the contact 61 passes back over the contacts on segment 60 no current flows through the circuits since the compensating mechanism is so employed that on the return movement the two arms 58 and 62 are separated and the hooked end 59 will move away from contact 61. The finger 11 is particularly provided for the 6 pound sacks however it may be used for the smallest sized sacks which pass over the belt.

The mechanism just described defines one unit of the system, each off-chute or diverting mechanism will have a complete layout such as is illustrated in the drawings and each will operate independently of the other. It is to be understood of course that circuits for conductors 16 and 17 can be supplied from a commercial line through the switch 86.

What I claim and desire to secure by Letters-Patent is:—

1. A device of the class described comprising an article guideway, an off-chute co-operating with the guideway, an article deflector for deflecting articles from the guideway into the off-chute and electrically operated means actuatable in response to impact and friction of the articles for rendering the deflector operative.

2. A device of the class described comprising a guideway, an off-chute co-operating with the guideway, a normally inoperative deflector at the intersection of the off-chute with the guideway and electrically operated means operative in response to impact and friction for rendering the deflector operative.

3. A device of the class described comprising a guideway, an off-chute intersecting the guideway, a normally inoperative deflector disposed diagonally across the guideway at the intersection of the chute therewith, means for holding the deflector rigid in diagonal position across the guideway and electrically operated means movable in response to impact for rendering the first named means operative.

4. A device of the class described, a main passageway, an off-take passageway co-operating with the main passageway, a yielding normally inoperative gate for directing material from the main passageway to the off-take passageway, a locking means for the gate including an electrically operative element, and means against which the material may contact in advance of the gate for energizing a circuit to cause the electrically operated element of the gate to function.

5. A device of the class described comprising a guideway, an off-take chute co-operating with the guideway, a gate for deflecting articles from the guideway into the the chute, a locking device for the gate to hold it in functional position, an electrical circuit for controlling the locking device, a plurality of independent conductors for energizing the circuit, the conductors having contact points, one for each, a movable contact adapted to independently engage the contacts for the conductors and means for varying the amplitude of the movable contact in response to the weight of the article traveling down the guideway.

6. A device of the class described, a main guideway, an auxiliary off-chute guideway, a gate for deflecting articles from the main guideway to the off-chute guideway, means for locking the gate in functional position, an electric circuit for energizing the first named means, a relay circuit for rendering

the first named circuit effective, a feeler-finger in the first named circuit in the path of articles moving down the guideway, a switch arm for the first named circuit having a part extending across the guideway for contact with the articles after they have passed the feeler-finger.

7. A device of the class described, a main guideway, an auxiliary of off-chute guideways, a gate for deflecting articles from the main guideway to the off-chute guideway, means for locking the gate in functional position, an electric circuit for energizing the first said means, a relay circuit for rendering the first named circuit effective, a feeler-finger in the first named circuit in the path of articles moving down the guideway, a switch arm for the first named circuit having a part extending across the guideway for contact with the articles after they have passed the feeler-finger, a deflector in advance of the feeler-finger and the arm for deflecting the articles into contact with the feeler-finger and the arm.

8. A device of the class described, a main guideway, an off-take guideway communicating with the first named guideway, a normally yielding deflector gate across the main guideway, means for holding the gate rigid, means for actuating the first named means and means in the off-take guideway for rendering the first named means effective so that the gate may yield after an article has passed over the last named means.

9. A device of the class described comprising a passageway, an off-take passageway communicating with the first, a gate at the intersection of the off-take passageway with the first named passageway, said gate being normally yieldable so that articles may pass the off-take passageway, electrically operated means for holding the gate rigid and means in the first named passageway rendered effective by impact of articles passing along the first named passageway to render the electrically operated means effective.

In testimony whereof I affix my signature.

RICHARD J. SHOLTZ.