

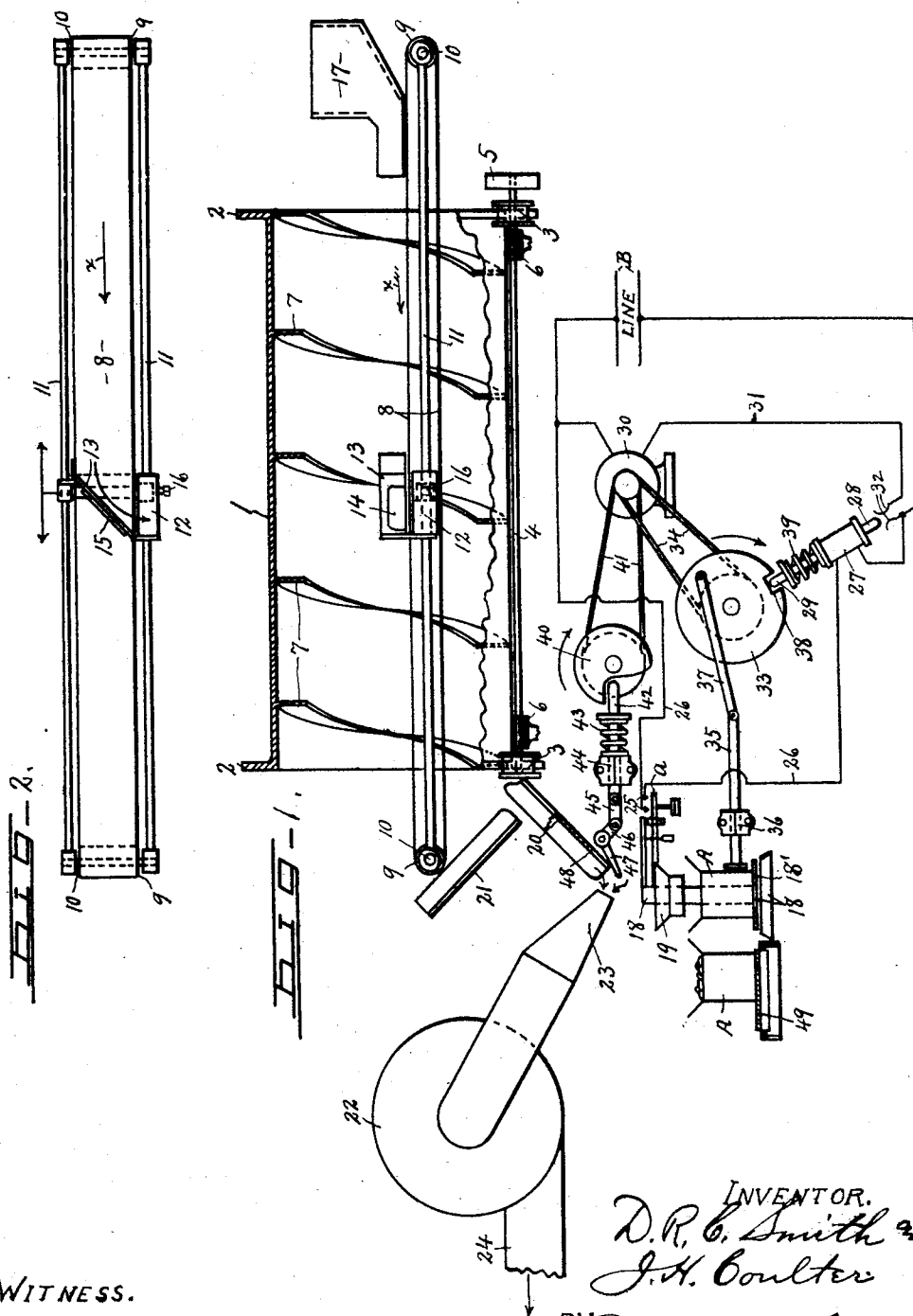
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D. R. C. SMITH ET AL

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WEIGHING APPARATUS FOR PACKAGING ONIONS AND THE LIKE

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WITNESS.

F. T. DeBoalt

INVENTOR.
D. R. C. Smith et al
J. H. Coulter

BY *Denison Thompson*
ATTORNEYS.

UNITED STATES PATENT OFFICE

DAVID R. C. SMITH AND JOHN H. COULTER, OF CANASTOTA, NEW YORK

WEIGHING APPARATUS FOR PACKAGING ONIONS AND THE LIKE

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This invention relates to apparatus for packaging onions and other vegetables or fruits in relatively small quantities of predetermined weight for wholesale or retail use.

It is well-known that onions and the like are encased in more or less useless husks particularly after they have been removed from the ground and have been exposed to the atmosphere for any considerable period of time and while the present invention may be used for packaging other vegetables and fruits it is specifically designed for the packaging of onions.

The main object is to provide simple and efficient means for automatically removing and separating the husks from the onions and simultaneously packaging the husked onions in relatively small bags or cartons of predetermined weights or measures ready for retailing to the consumers and thereby relieving the retailer from the laborious process of measuring out small quantities from bulk stock to suit the demands of the consumer, all of which greatly reduces the expense of handling the onions between the producer and consumer.

Other objects and uses relating to specific parts of the apparatus will be brought out in the following description.

In the drawing:

Figure 1 is a diagrammatic view, partly in section, of an apparatus for husking onions, removing the husked onions and weighing the same.

Figure 2 is a top plan of the conveyor belt used in connection with the husking mechanism showing also the means for deflecting the onions from the belt at any point in the travel of the upper side thereof.

As illustrated, this device comprises a tubular cylindrical drum 1 having opposite end flanges 2 which are journaled upon roller bearings 3 to permit the drum to rotate about a substantially horizontal axis, the rollers 3 being located equal distances from and at opposite sides of a vertical plane passing through the axis of the drum 1, the rollers 3 at at least one side of the drum may be connected by a suitable driving shaft 4 having at

its one end a pulley 5 adapted to be connected to said available source of power, not shown.

The entire weight of the drum is borne by the rollers 3 which are provided with annular grooves in which the flanges 2 rest to hold the drum against relative endwise movement, it being understood that the shaft 4 will also be held against endwise movement by any suitable bearings 6.

The rotation of one or the other sets of rollers 3 through the medium of the connecting shaft 4 serves to rotate the drum more or less slowly about its axis.

The drum 1 is provided with an internal screw, consisting of blades 7 projecting inwardly from the inner periphery thereof but relatively short radially or of just sufficient radial depth to assure the feeding of the onions which may be deposited into the interior of the drum from one end to the opposite end thereof as will be hereinafter more fully explained.

An endless belt 8 is extended horizontally through and beyond the opposite ends of the drum 1 in a plane slightly below but parallel with the axis thereof, said belt having its opposite ends supported upon suitable pulleys 9 which, in turn, are mounted upon coaxial shafts 10 extending axially through and beyond the ends of the drums of the pulley 9, as shown in Figure 2.

The outer ends of the shafts 10 are connected by lengthwise guide rods 11 extending along opposite sides of the belt 8 in proximity thereto for receiving and supporting a slidable cross head 12 having apertured bearings through which the rods 11 are passed.

This cross head 12 is movable lengthwise of and upon the rods 11 between the lower and upper sides of the belt 8 and is provided with a deflecting plate 13 extending diagonally across the upper surface of the top side of the belt closely adjacent thereto and has its opposite ends connected to the cross head 12 at opposite edges of the belt and in sufficiently spaced relation thereto to permit free movement of the upper side of the belt without friction with the cross head 12 or deflecting plate 13.

This deflecting plate 13 is inclined hori-

zontally in the direction of movement of the upper side of the belt 8 as indicated by arrow *x*, Figure 2, and is provided midway between its ends with an opening 14 extending upwardly from the lower edge thereof a sufficient height to allow the onions carried by the belt to pass therethrough, the width of the opening 14 being approximately equal to the width of the adjacent portion of the belt so as to allow all of the onions which may rest upon the upper side of the belt to readily pass through the opening 14 unless the latter is closed.

The opening 14 is, however, provided with a closure 15 adapted to be moved vertically to and from a position across the opening 14 in suitable guides, not shown, on the deflecting plate 13, as shown in Figure 2.

As previously stated, this deflecting plate 13 and its supporting cross head 12 are adjustable to different positions along the guide rods 11 between the opposite ends of the drum 1 and may be set and locked in any position of adjustment by means of a set screw 16, the position of the deflecting plate depending upon the condition of the onions to be husked. That is, the husks of some onions may be more numerous, looser and drier than others and, therefore, may require a shorter period of tumbling in the drum 1 than those having firmer and more edible layers and the primary object of the deflecting plate 13 and its adjustability along the belt 8 is to enable the onions to be deflected from the belt into the interior of the drum at different distances from the receiving end of the drum according to the condition of the husks of the onions.

On the other hand, if the onions are fresh and all of the layers are solid and edible the gate or closure 15 may be opened to allow the onions to be fed by the belt 8 entirely through the drum and through the opening 14 without deflecting them into the drum.

A hopper 17 may be supported in any desired manner in proximity to and preferably directly over the receiving end of the belt 8 at the corresponding end of the drum 1 for receiving the onions to be treated and permitting them to be fed by gravity directly upon the upper side of the belt to be carried into or through the drum 1 as may be required according to the condition of the husks of the onions.

A weighing scale 18 may be supported in any suitable manner in a plane below and some distance beyond the delivery end of the drum 1 for receiving and supporting a carton, bag or other container A, the weighing scales being provided with the usual platform 18' upon which the carton A is removably supported.

A guide tube or supplemental hopper 19 may be supported upon the upright or other fixed portion of the weighing scale 18 or upon any other available support so as to assume

a position directly over the open upper end of the carton or bag A but below the delivery end of the drum 1.

A guide chute 20 is suitably supported at the delivery end of the drum 1 to extend downwardly and forwardly from the lower side thereof with its lower end directly over the supplemental hopper 19 for guiding the onions from the delivery end of the tube 1 into said hopper and thence into the container A.

A similar but reversely inclined chute 21 is supported at the delivery end of the belt 8 to receive the onions therefrom and to convey them into the guide chute 20.

A suction pump or blower 22 may be supported in any suitable position preferably at the rear of the drum 1 and is provided with a suitable nozzle 23 in close proximity to the delivery end of the chute 20 for removing the husks which may have been separated from the onions in transit through the drum 1, said husks being conducted from the pump through a delivery tube 24 to any place of deposit away from the husked onions.

Suitable means is provided for automatically cutting off the feed of the husked onions from the chute 20 into the receptacle A when the onions in the receptacle reach a predetermined weight as indicated by the weighing scales 18 and for this purpose the free end of the movable member or weighing beam —*a*— of the scale may form an electric conductor as the movable part of an electric switch to contact with a pair of terminals 25 of an electric circuit 26 deriving current from the main line circuit B so that when the quantity of onions deposited in the container A reaches a predetermined weight as indicated by the scales 18 the elevation of the free end of the movable member 8 will close the circuit 26 through a solenoid 27 in said circuit.

This solenoid is provided with a movable core or plunger having one end constituting a movable switch member 28 and its other end serving as a locking member 29 for a purpose hereinafter described.

An electric motor 30 is connected by a wire 31 across the solenoid circuit 26 through the medium of normally separated switch terminals 32 which are adapted to be engaged by the adjacent end 28 of the solenoid plunger for closing the circuit through the motor when the solenoid is energized in the manner previously described.

It is now evident that the electric motor 30 is controlled by the solenoid switch 28 and that the energizing of the solenoid is controlled by the movable member —*a*— of the carrying scales so that instantly upon the filling of the container A to the required weight the solenoid switch member 28 may be operated to close the circuit through the motor 30.

Suitable means is provided for displacing the container A from the platform 18' of the weighing scales as soon as it is filled with onions of predetermined weight indicated by the scales and simultaneously with the energizing of the solenoid 27 and for this purpose is provided a rotary disk 33 which may be supported in any suitable manner and is adapted to be driven by a motor 30 through the medium of a belt 34, Figure 1.

A push rod 35 is provided with a bearing 36 for reciprocal movement across the upper surface of the platform 18' of the weighing scales for the purpose of displacing the filled container A from said platform, said push rod being connected by a pitman 37 to the disk 33 at one side of its axis of rotation and a sufficient distance from said axis to cause the displacement of the container entirely from the platform at each revolution of the disk.

The disk 33 is provided with a peripheral notch 38 which is normally engaged by the locking member 29 of the solenoid 27 and is yieldingly held in its locking position by a spring 49.

When the disk 33 is locked against rotation by its locking member 29 the push rod 35 will be withdrawn to one side of the platform 18' of the scales to allow the container A to stand squarely thereon and to permit replacement of empty containers after the filled containers have been removed.

It is now evident that at practically the same instant that the required weight of the onions is deposited in the container A the solenoid circuit 26 will be closed by contact of the member —a— with the terminals 25 thereby closing the motor circuit for operating the motor at which time the locking member 29 will be withdrawn from the notch 38 in the disk 33 to permit said disk to be rotated by the motor for causing the push rod 35 to displace the filled container A from the platform 18'.

Immediately upon the displacement of the filled container from the platform, the weighing beam —a— of the scales will be moved by its own weight out of contact with the terminals 25 to open the solenoid circuit and allow the locking member 29 to be returned to its locking position by the spring 39 as soon as the notch 38 is registered with the locking member 29 or at the end of one complete revolution of the disk which displaces the carton A from the platform 18' and immediately returns the push rod 35 to its starting position.

Instantly upon the return of the solenoid plunger to its locking position it will also break the motor circuit to stop the motor circuit and at the same time stop the motor through the medium of the belt connection 34 between the disk 33 and motor shaft.

Suitable means is also provided for stop-

ping the flow of the onions from the chute 20 into the hopper 19 simultaneously with the closing of the solenoid circuit 26 or immediately upon the filling of the container A to the required weight and for this purpose a rotary cam 40 is supported in any desired manner and operatively connected by a belt 41 to the shaft of the motor 30.

This cam 40 is adapted to operate a push rod 42 against the retracting spring 43, said push rod being reciprocally movable in a relative stationary bearing 44.

The push rod 42 is connected by a link 45 to one arm of a bell crank lever 46 which may be pivotally supported in any desired manner adjacent the lower end of the chute 20 and is provided with a series of radially projecting fingers 47 which are movable in slots 48 in the bottom of the lower end of the chute 20 to project across the path of movement of the onions along the chute for temporarily stopping the flow of the onions from the chute to the hopper immediately upon the filling of the container A with onions to the required weight.

The cam 40 is arranged to operate the push rod 42 and gate 47 controlled thereby once during each revolution of the disk 33 or immediately upon the filling of the container A to the required weight and resultant energizing of the solenoid 27 in the manner previously explained.

In other words, the cam 40 is constructed and timed to close the gate 47 immediately upon the operation of the push rod 35 for displacing the filled container A from the platform 18' and to return to its normal position simultaneously with the return of the push rod 35.

It, therefore, follows that the disk 33 and cam disk 40 will be simultaneously rotated one complete revolution at a time to effect the simultaneous operation of the cut-off 47 and push rod 35 from their normal positions shown by full lines, Figure 1, to their operative positions.

As the filled containers A are displaced from the platform 18' of the weighing scales by the push rod 35 they are deposited upon a separate support 49 which may be another conveyor-belt or its equivalent for removing the filled containers as fast as they are displaced from the weighing scales.

It will be noted from the foregoing description of the operation of the machine that the process consists, as previously stated, in automatically removing the loose husks from the onions, removing the husks, conducting the husked onions into a suitable container.

We claim:

1. In a weighing apparatus, the combination of a scale upon which the individual containers to be filled and weighed are successively placed, mechanism for feeding the

material to be weighed into the container on the scale, an electric motor, a rotary cam driven by the motor, means controlled by the scale for controlling the operation of the motor, and means actuated by the cam for stopping the flow of the material into the container on the scale when the latter is operated by a predetermined weight of the container and material therein.

2. In a weighing apparatus, the combination of a scale upon which the individual containers to be filled and weighed are successively placed, mechanism for feeding the material to be weighed into the container on the scale, a rotary disk, means normally locking the disk against rotation, means controlled by the scale for releasing the locking means, means for rotating the disk when released, and a push rod actuated by the disk for displacing the container with the material therein from the scale.

3. The combination with a weighing scale upon which the individual containers to be filled and weighed are successively placed, and means for feeding material into the container on the scale, of a rotary element, means including a detent for normally holding said element against rotation, means brought into action by the operation of said scale when the container and material therein reaches a predetermined weight for tripping the detent, means for rotating said element when the detent is tripped, and means actuated by the rotation of said element for cutting off the feed of material to the container.

4. The combination with a weighing scale upon which the individual containers to be filled and weighed are successively placed, and means for feeding material into the container on the scale, of rotary actuators connected for simultaneous rotation, a detent normally holding both of said actuators against rotation, means brought into action by the operation of the scale through the weight of the container and material therein for tripping the detent, means for rotating the actuators when the detent is tripped, means actuated by one of the actuators for cutting off the feed of material to the container, and means actuated by the other actuator for displacing the charged container from the scale.

In witness whereof we have hereunto set our hands this 1st day of April, 1929.

DAVID R. C. SMITH.
JOHN H. COULTER.