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SLICING AND WEIGHING MACHINE

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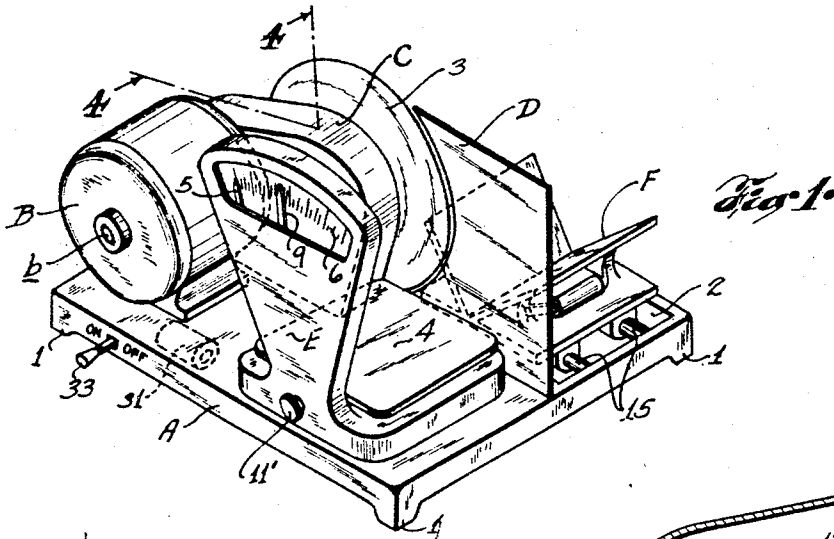


Fig. 1.

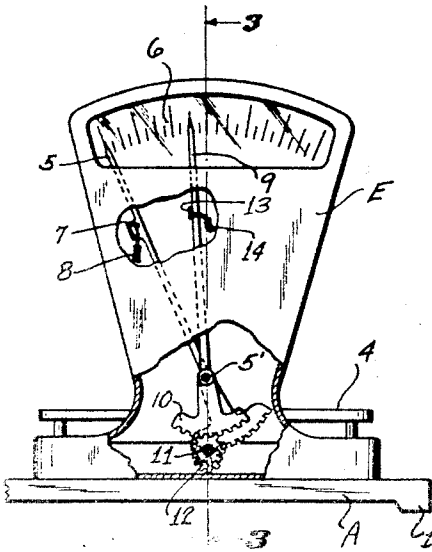


Fig. 2.

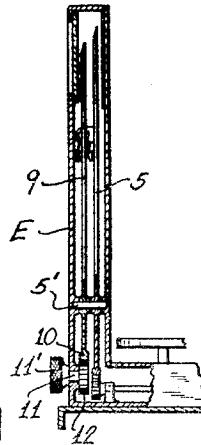


Fig. 3.

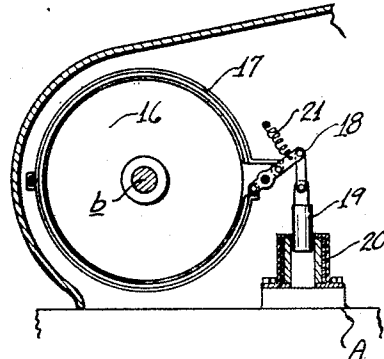


Fig. 4.

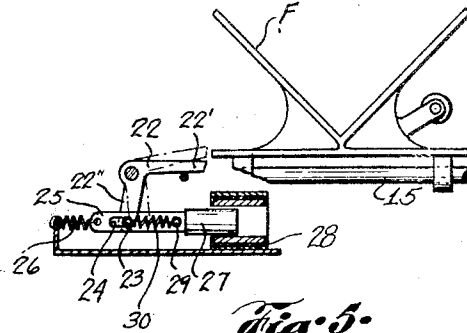


Fig. 5.

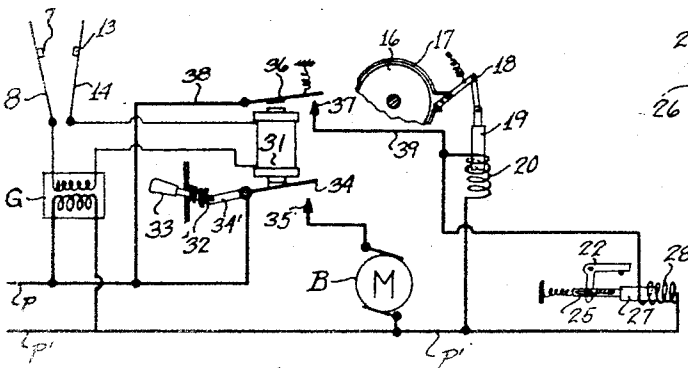


Fig. 6.

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SLICING AND WEIGHING MACHINE

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4 Claims. (Cl. 249—62)

This invention relates in general to certain new and useful improvements in slicing machinery and has for its principal object the provision of a slicing machine which will automatically receive the substance slices and simultaneously weigh them, giving a continuous indication of the aggregate weight of substance slices delivered by the machine in any one cutting operation.

My invention also has for an object the provision of a slicing machine which may be set for any predetermined aggregate weight of substance slices and will automatically discontinue the slicing operations as soon as the predetermined weight has been reached, preventing any further delivery of substance slices above such predetermined weight.

My invention has for a further object the provision of a slicing machine of the type stated which is extremely simple and economical in construction, maintenance, and operation costs; and which is otherwise highly efficient and satisfactory in the performance of its intended objects.

And with the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of the several parts presently described and pointed out in the claims.

In the accompanying drawing,

Figure 1 is a perspective view of a slicing machine constructed in accordance with and embodying my present invention;

Figure 2 is a fragmentary side elevational view of the slicing machine, partly broken away and in section for more detailed illustration of the weighing and setting mechanism;

Figure 3 is a fragmentary vertical sectional view of the weighing and setting mechanism, taken approximately along the line 3—3, Figure 2;

Figure 4 is a fragmentary vertical sectional view of the slicing machine, taken approximately along the line 4—4, Figure 1;

Figure 5 is a fragmentary view of the slicing machine, partly broken away and in section, for more detailed illustration of the carriage lock mechanism; and

Figure 6 is a schematic view of the wiring diagram of the slicing machine.

Referring now more in detail and by reference characters to the drawing, which illustrates a preferred embodiment of my invention, A designates a flat preferably rectangular base having suitable downwardly presented supporting legs 1 and being provided with a rectangular opening 2 formed inwardly of and parallel to a lengthwise margin of the base A, as best seen in Figure

1 and for purposes presently more fully appearing.

Mounted rigidly upon the upwardly presented face of the base A, is an electrical motor B connected in any conventional manner to a suitable source of electric power, the latter not being shown. Also mounted rigidly on the upwardly presented face of the base A, is a conventional protectively housed rotary slicing knife mechanism C operatively connected to the drive shaft of the motor B and having a circular or disk-like cutting blade 3, a gauge plate D being mounted on the base A in upstanding alignment with the circular cutting blade 3 for regulating the thickness of the substance slices, as well as for protecting the user against accident.

Likewise mounted rigidly on the upwardly presented face of the base A in suitable juxtaposition to the cutting blade 3 and the gauge plate D for receiving the substance slices as they are cut by the cutting mechanism C, is the weighing mechanism E having a flat slice-receiving weighing platform 4 operably mounted for vertically shiftable movement responsive to the weight of the substance slices deposited thereon, and being connected by any suitable weighing system of springs or levers to an indicating hand 5 rotatably mounted on a small shaft or pin 5' for swingable movement in front of a graduated indicating scale 6. The indicating hand 5 is provided intermediate its ends with an electrical contact point 7 connected to a flexible lead wire 8. Also rotatably mounted on the small shaft or pin 5' for swingable movement over the indicating scale 6 in a plane spaced from the plane of movement of the indicating hand 5, is a setting arm 9 provided at its lower end with an arcuate or segmental rack 10, as best seen in Figures 2 and 3.

Journalled in and extending through the side wall of the weighing mechanism E, is a setting knob shaft 11 provided at its outwardly extending end with a setting knob 11' and at its inwardly extending end with a pinion 12 arranged for operative meshing engagement with the segmental rack 10 of the setting arm 9. The setting arm 9 is further provided intermediate its ends with an electrical contact member 13 connected to a flexible lead 14. The contact member 13 is so positioned along the setting arm 9 as to contactingly engage the electrical contact member 7 of the indicating hand 5 when the indicating hand 5 and the setting arm 9 are in overlying registration, all as best seen in Figures 2 and 3 and for purposes presently more fully appearing.

Rigidly mounted in the base A and extending transversely across the aperture 2 thereof, is a pair of laterally spaced parallel slide rods 15. Shiftably mounted on the slide rods 15 for reciprocation past the cutting wheel 3 of the cutting mechanism C, is a substance carrier F which may be of any conventional character and design, although for purposes of illustration I have shown a substance carrier of the V-shaped manually operable type.

Mounted rigidly on the drive shaft b of the motor B interiorly of the housing of the cutter mechanism C, is a brake drum 16 provided with an encircling brake band 17, which is, in turn, actuated through a suitable lever and link mechanism, as at 18, to the shiftable core 19 of a fixed solenoid 20, which is, in turn, rigidly mounted upon the base A. The lever and link mechanism 18 is suitably provided with a tension spring 21 for normally maintaining the brake band 17 and the brake actuating mechanism out of engagement with the drum 16, all as best seen in Figure 4 and for purposes presently more fully appearing.

Pivotally mounted on the under side of the base A adjacent the inner lengthwise margin of the base aperture 2 is a bell crank member 22 having a horizontally extending arm 22' for optional engagement with the base portion of the substance carrier F, the bell crank member 20 being so positioned on the base A with respect to the cutting knife 3 as to prevent movement of the substance carrier F toward the cutting knife 3 for further slice-cutting operation when the bell crank arm 22' is in substance carrier engaging position. The other bell crank arm 22'' is provided with a pin 23 for disposition in the slot 24 of an actuator bar 25. The actuator bar 25 is at its one end rigidly connected to a tension spring 26 and at its other end is rigidly connected to the shiftable core bar 27 of a solenoid 28 rigidly mounted on the machine base A. The actuator bar 25 is further provided with an outwardly presented pin 29 for supporting engagement with one end of a tension spring 30, which is, in turn, at its other end, mounted on the pin 23 of the bell crank arm 22'', all as best seen in Figure 5 and for purposes presently more fully appearing.

Also operatively mounted on the under side of the base A, is a double pole relay 31 of any conventional design and a toggle member 32 having a manually operable arm 33 extending outwardly beyond a marginal edge of the base A for convenient manual operation.

Referring now to the wiring diagram in Figure 6, it will be evident that the indicator arm contact member 7 is connected through the flexible lead 8 to one side of the secondary winding of a conventional transformer G, the primary of the transformer G being connected across the main power lines p, p'. The other side of the secondary winding of the transformer G is connected to one terminal of the winding on the relay 31, the other relay winding terminal being connected through the flexible lead 14 to the setting arm contact point 13. One magnetic pole of the relay 31 is disposed in juxtaposition to the switch bar 34, which is, in turn, swingably mounted and provided with a preferably integral extension 34' pivotally connected to the inner end of the toggle arm 33, the switch bar 34 being arranged for circuit completing engagement with a switch terminal 35, which is, in turn, connected to one terminal of the motor B, the other

terminal of the motor B being connected directly to one of the power lines p'. The other magnetic pole of the relay 31 is disposed in operative juxtaposition to a pivotally mounted switch blade 36, which is arranged for circuit completing engagement with a switch terminal 37 and is connected through the lead 38 to the power line p. The terminal 37 is connected through the lead 39 to one terminal of the solenoid 20 and also to one terminal of the solenoid 28, the other terminals of the solenoids 20 and 28 being each connected directly to the power line p'.

In operation, the setting arm 9 is moved to any predetermined position corresponding to the particular weight of material desired to be sliced. Since, at this moment, no slices have been as yet delivered onto the platform 4, the indicating arm will remain at zero and the contact point 7 thereof will accordingly be out of engagement with the contact point 13 of the indicating arm 9. Under these conditions, the circuit through the transformer to the winding of the relay 31 will be incomplete and the relay will accordingly be inoperative. Since the relay is inoperative, the switch blade 36 will also be out of engagement with the terminal 37 and the circuit to the solenoids 20 and 28 will likewise be incomplete. The toggle arm 33 may then be swung or pivoted to bring the switch blade 34 into operative engagement with the terminal 35, thus completing the circuit to the motor B and setting the cutting mechanism in operation. Since the circuit to the solenoids 20 and 28 is incomplete, the motor brake band 17 will be disengaged from the motor brake drum 16 and the carriage locking bell crank member 22 will likewise be in disengaged position, permitting free movement of the substance carrier F. The operator thereupon may reciprocate the substance carrier F to and fro past the cutting knife for slicing operation. As the slices are cut, they will drop of their own weight upon the platform 4 of the weighing mechanism E and cumulatively swing the indicator hand 5 toward the setting arm 9. As soon as a sufficient number of slices have been cut to bring the indicating arm up to the desired weight, the contact point 7 thereof will be brought into engagement with the contact point 13 of the setting arm 9, thereby completing the circuit through the winding of the relay 31, whereupon the relay will become energized and simultaneously swing the switch blade 34 out of operative engagement with the terminal 35 and swing the switch blade 36 into operative engagement with the terminal 37, thereby breaking the circuit to the motor B and completing the circuit to the solenoids 20, 28. The solenoids 20 and 28 will each thereupon become energized and the brake band 17 will be moved into braking engagement with the motor brake drum 16 and the carriage locking bell crank member 22 will be moved upwardly into carriage locking position, as shown in dotted lines in Figure 5. The carriage may then be moved backwardly over the bell crank arm 22', which will swing downwardly against the action of the spring 30, allowing the carrier F to clear, but will then swing upwardly for latch-like engagement and prevent further movement of the substance carrier F for a subsequent substance cutting stroke. At the same time, by reason of the braking action of the brake band 17, the entire cutting mechanism will be brought to rest. As soon as the operator removes the substance slices from the platform 4, the indicating hand 5 will swing backwardly again to zero and the con-

act member 7 thereof will again be moved out of engagement with the contact member 13 of the setting arm 9, whereupon the relay 31 will become de-energized and the switch blade 36 will be released, breaking the circuits to the solenoids 20, 28, and accordingly releasing both the motor braking and carriage locking mechanisms. The switch blade 34, however, although released from the relay, will nevertheless be maintained out of engagement with the terminal 35 by means of the toggle arm 33 and the machine will be restored to original inoperative position.

It will be evident that by my invention I have provided a slicing machine which is extremely unique in its convenience and usefulness in connection with a variety of commercial uses. For instance, in a delicatessen or butcher shop, the clerk in slicing meat, cheese, or the like may set the machine to the weight desired by the particular customer and slice the substance directly onto the receiving platform. As soon as the desired weight has been reached, the machine will automatically be stopped without cutting other slices, thus eliminating the necessity of slicing a certain quantity of the substance by guesswork, removing it to a remote scale or weighing mechanism, and then cutting a few additional slices provided the desired weight has not been attained. In addition to this, the present invention prevents the cutting of slices over and beyond the desired weight. Previously if more of the substance was sliced than the desired amount, the extra slices were retained until the next customer came along. In this interim, the slices usually dried out and became unsalable. It will further be evident that the present invention can be with equal facility applied to entirely automatic slicing machines equipped with power driven feeding mechanism, in which event the clerk may set the machine to the weight desired by the customer, start the machine in operation, and leave it to wait on another customer or supply additional needs of the same customer, leaving the machine unattended during the slicing operation, since the machine will automatically discontinue slicing operations when the desired weight of substance has been sliced.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the slicing machine may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is,

1. In a slicing machine having a substance slicer, an electric motor for driving the slicer, a substance carrier, a shiftably mounted platform for receiving the substance slices, and limit switch means operatively connected to the platform for actuation responsive to movement thereof, control means comprising a toggle switch connected in series with the electric motor and having a manually operable arm for throwing the switch into circuit-closing position, a relay controlled by the limit switch for moving the switch into circuit-opening position, brake means operably mounted on the substance slicer for arresting further movement thereof, solenoid-actuated brake operating means connected to the brake means, and a second switch connected in series with the brake-actuating solenoid for selectively completing and breaking the circuit thereto, said switch being mounted for actuation by the relay.

2. In a slicing machine having a substance slicer, an electric motor for driving the slicer, a substance carrier, a shiftably mounted platform for receiving the substance slices, and limit switch means operatively connected to the platform for actuation responsive to movement thereof, control means comprising a toggle switch connected in series with the electric motor and having a manually operable arm for throwing the switch into circuit-closing position, a relay controlled by the limit switch for moving the switch into circuit-opening position, brake means operably mounted on the substance slicer for arresting further movement thereof, solenoid-actuated brake operating means connected to the brake means, and a second switch connected in series with the brake-actuating solenoid for selectively completing and breaking the circuit thereto, said switch being adapted for movement into circuit-completing position by the relay when the latter is energized and for movement into circuit-interrupting position when the relay is de-energized.

3. In a slicing machine having a substance slicer, an electric motor for driving the slicer, a substance carrier, a shiftably mounted platform for receiving the substance slices, and limit switch means operatively connected to the platform for actuation responsive to movement thereof, control means comprising a toggle switch connected in series with the electric motor and having a manually operable arm for throwing the switch into circuit-closing position, a relay controlled by the limit switch for moving the switch into circuit-opening position, a carrier lock operably mounted on the substance carrier for arresting further movement thereof, solenoid-actuated operating means connected to the carrier lock, and a second switch connected in series with the lock-actuating solenoid for selectively completing and breaking the circuit thereto, said switch being adapted for movement into circuit-completing position by the relay when the latter is energized and for movement into circuit-interrupting position when the relay is de-energized.

4. In a slicing machine having a substance slicer, an electric motor for driving the slicer, a substance carrier, a shiftably mounted platform for receiving the substance slices, limit switch means operably connected to the platform for actuation responsive to movement thereof, control means comprising a toggle switch connected in series with the electric motor and having a manually operable arm for throwing the switch into circuit-closing position, a relay controlled by the limit switch for moving the switch into circuit-opening position, brake means operably mounted on the substance slicer for arresting further movement thereof, solenoid actuated brake operating means connected to the brake means, a carrier lock operably mounted on the substance carrier for arresting further movement thereof, solenoid-actuated operating means connected to the carrier lock, and a second switch connected in series with the brake-actuating solenoid and the lock-actuating solenoid for simultaneously completing and breaking the circuits thereto, said switch being adapted for movement into circuit-completing position by the relay when the latter is energized and for movement into circuit-interrupting position when the relay is de-energized.

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