

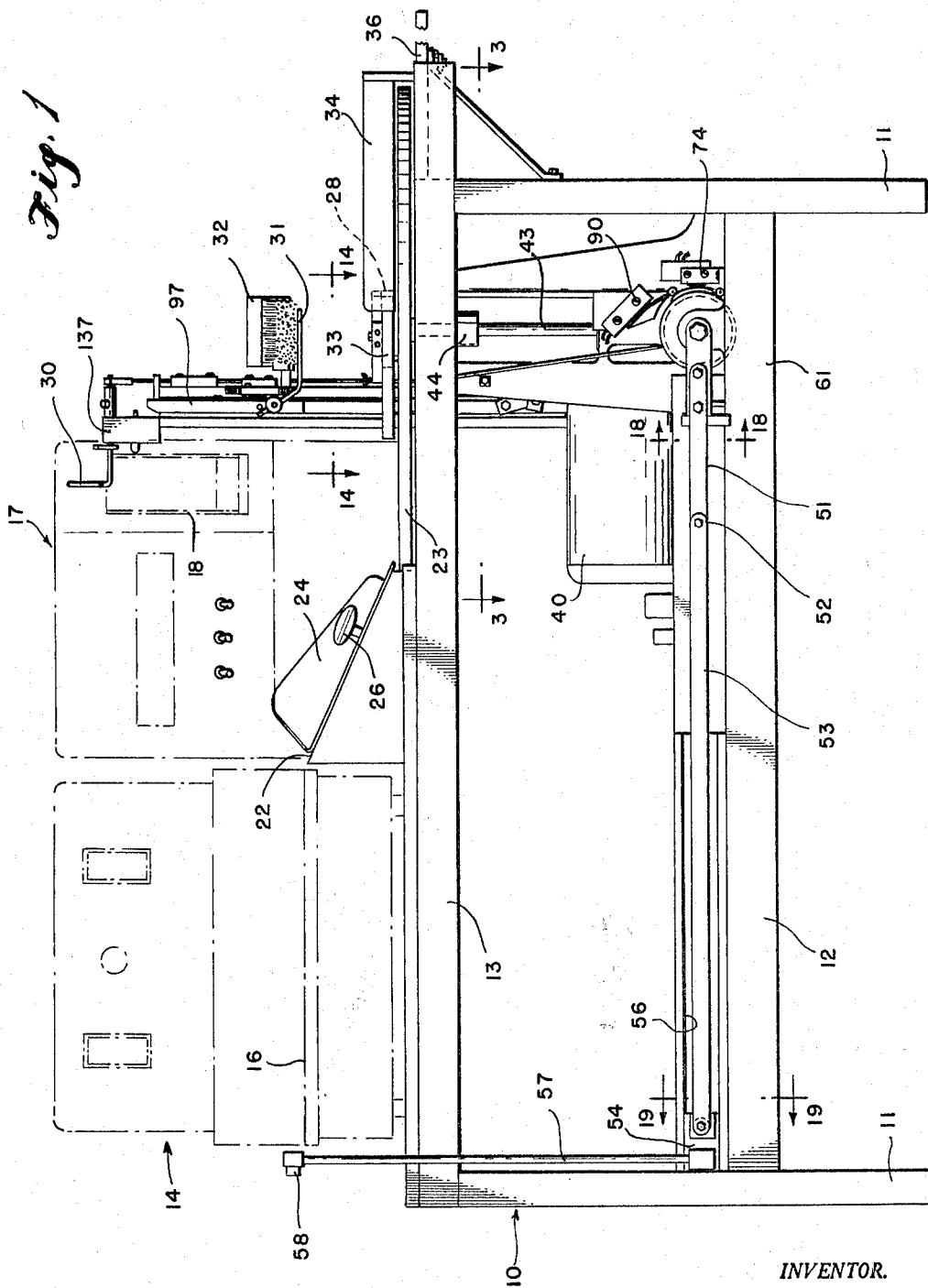
Nov. 8, 1966

M. S. PARKS
LABELING MACHINE

3,284,271

Filed May 10, 1962

10 Sheets-Sheet 1



INVENTOR.
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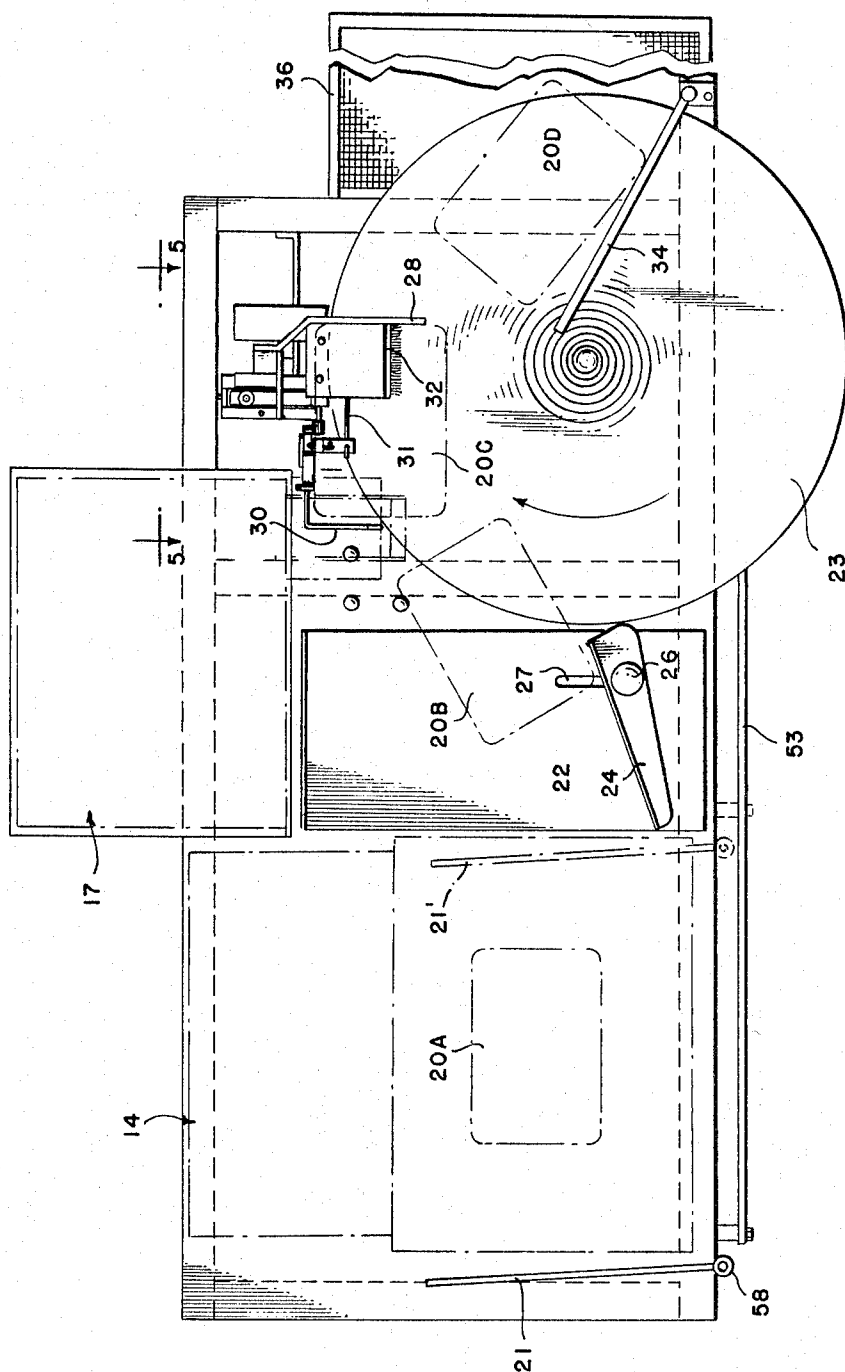
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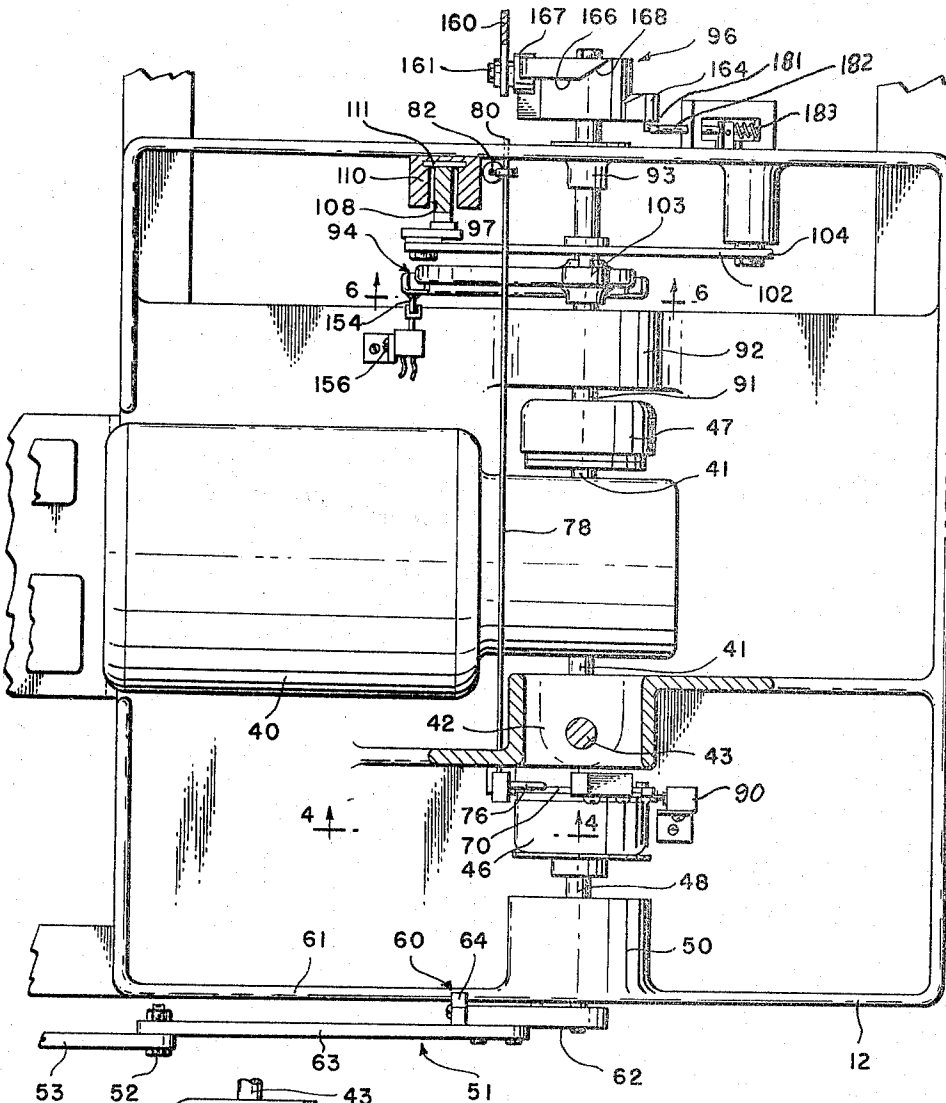


Fig. 3

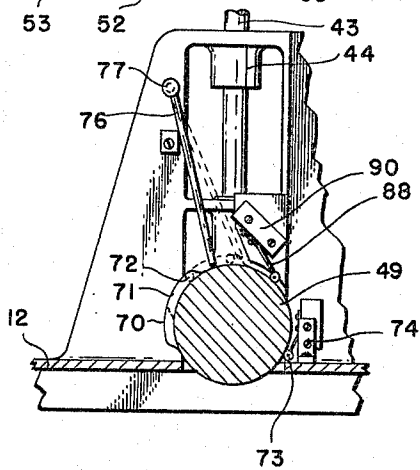


Fig. 4

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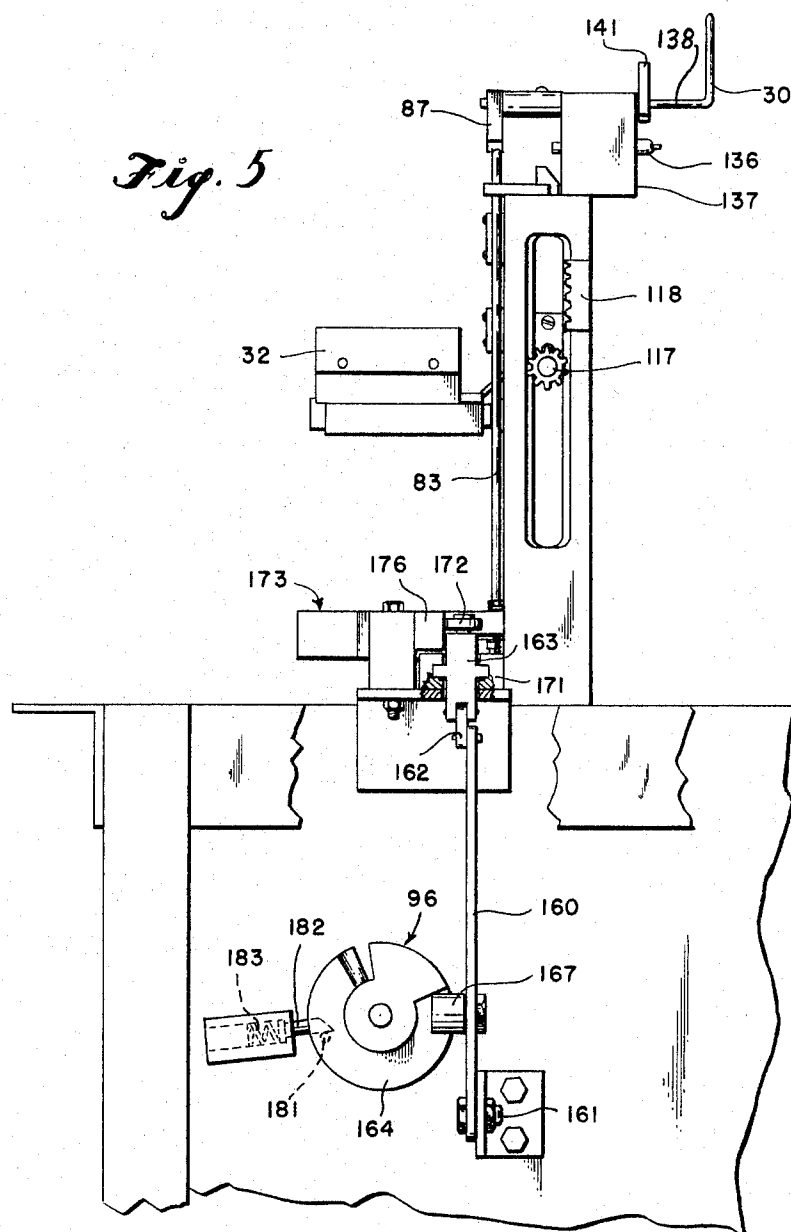
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Fig. 6

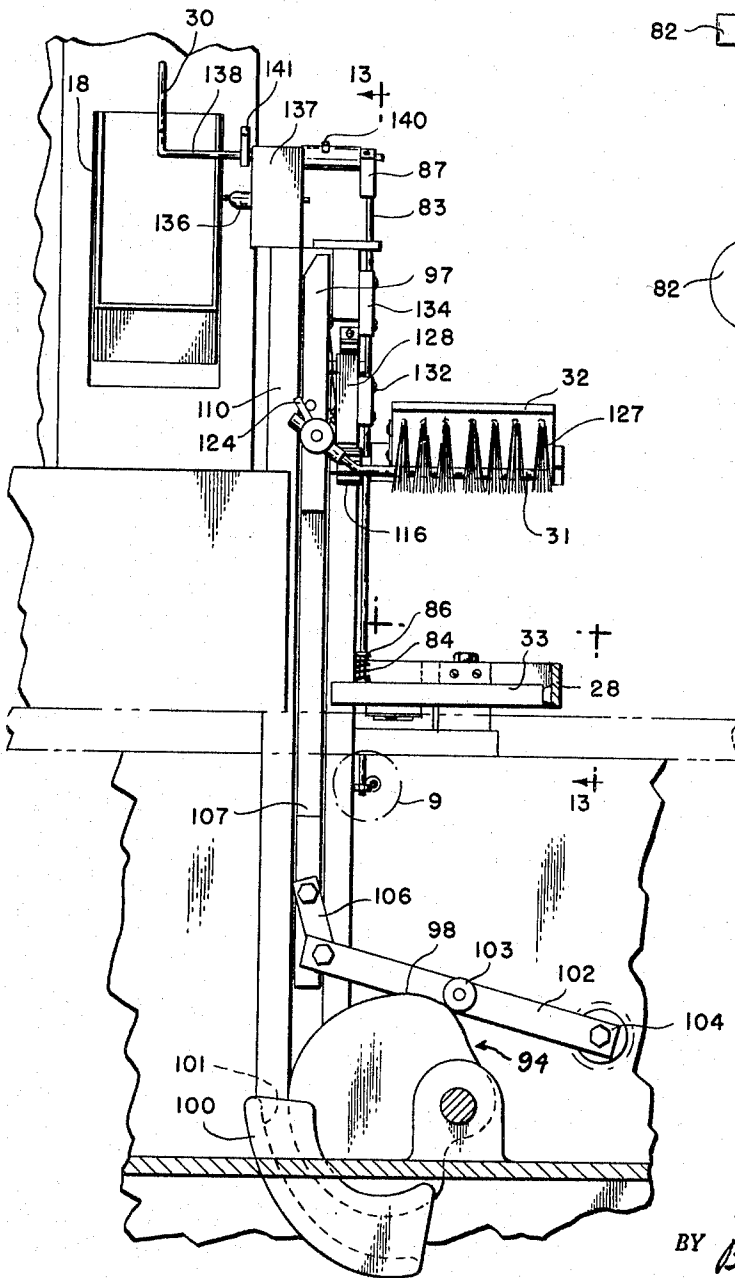


Fig. 9

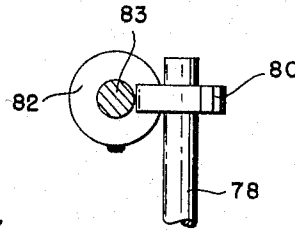
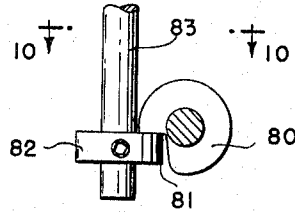


Fig. 10

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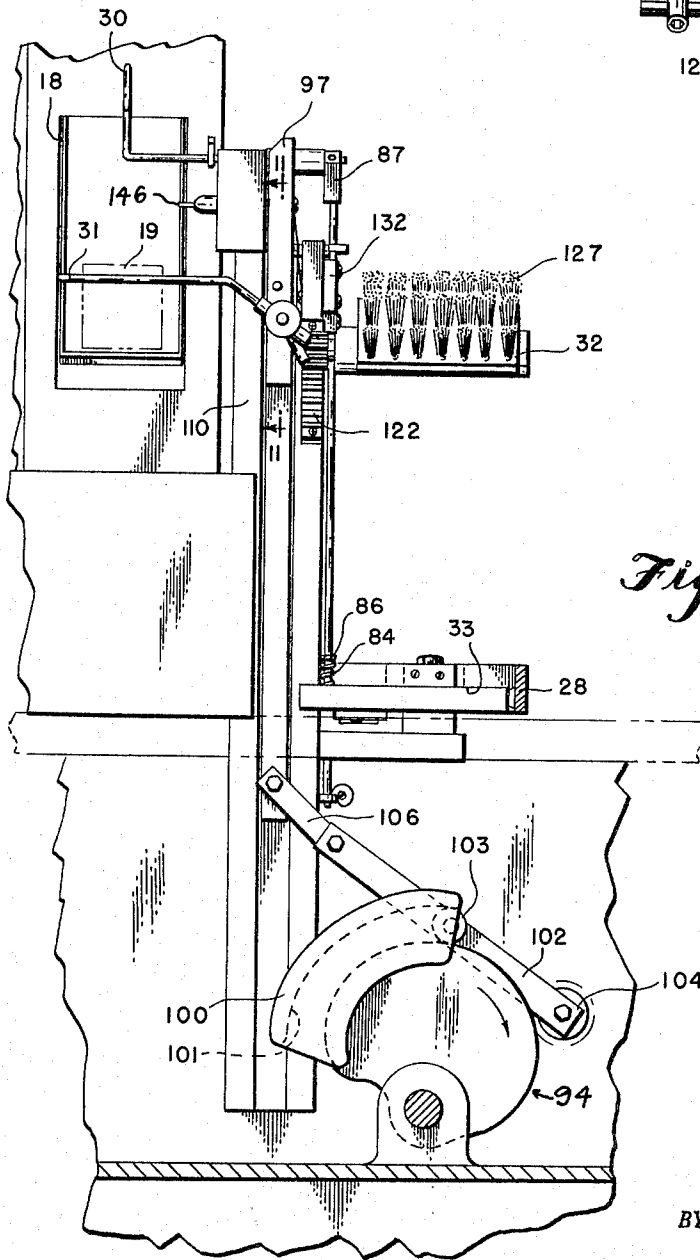


Fig. 7

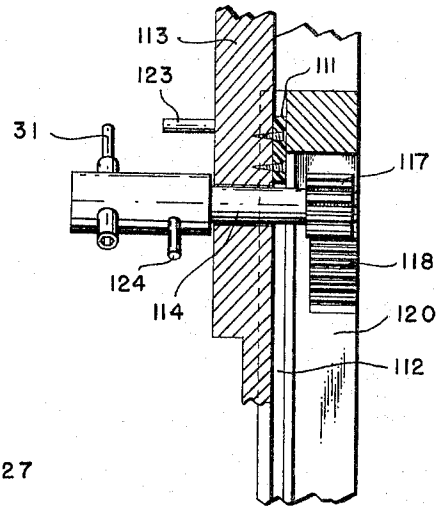


Fig. 11

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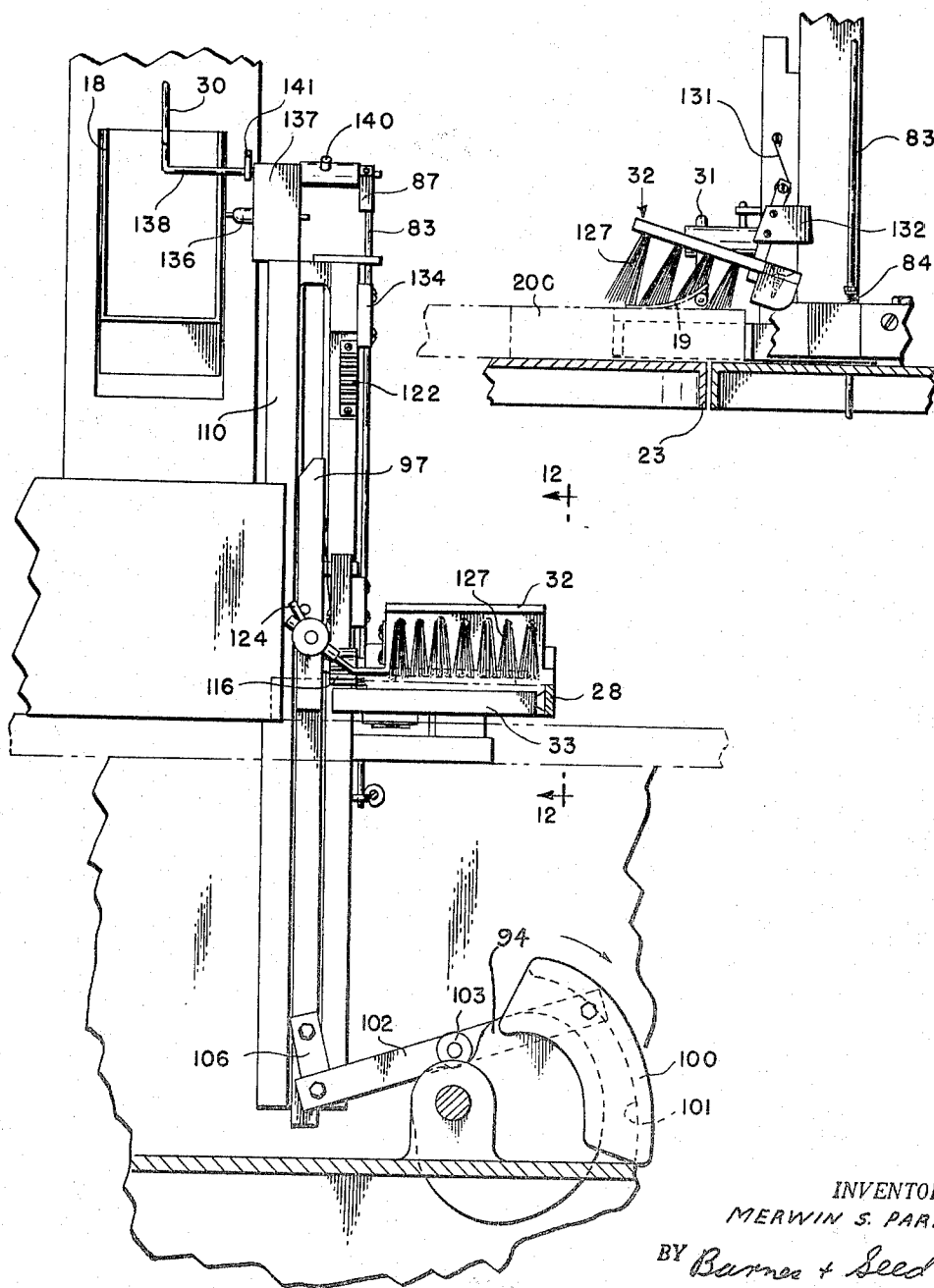
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Fig. 8

Fig. 12



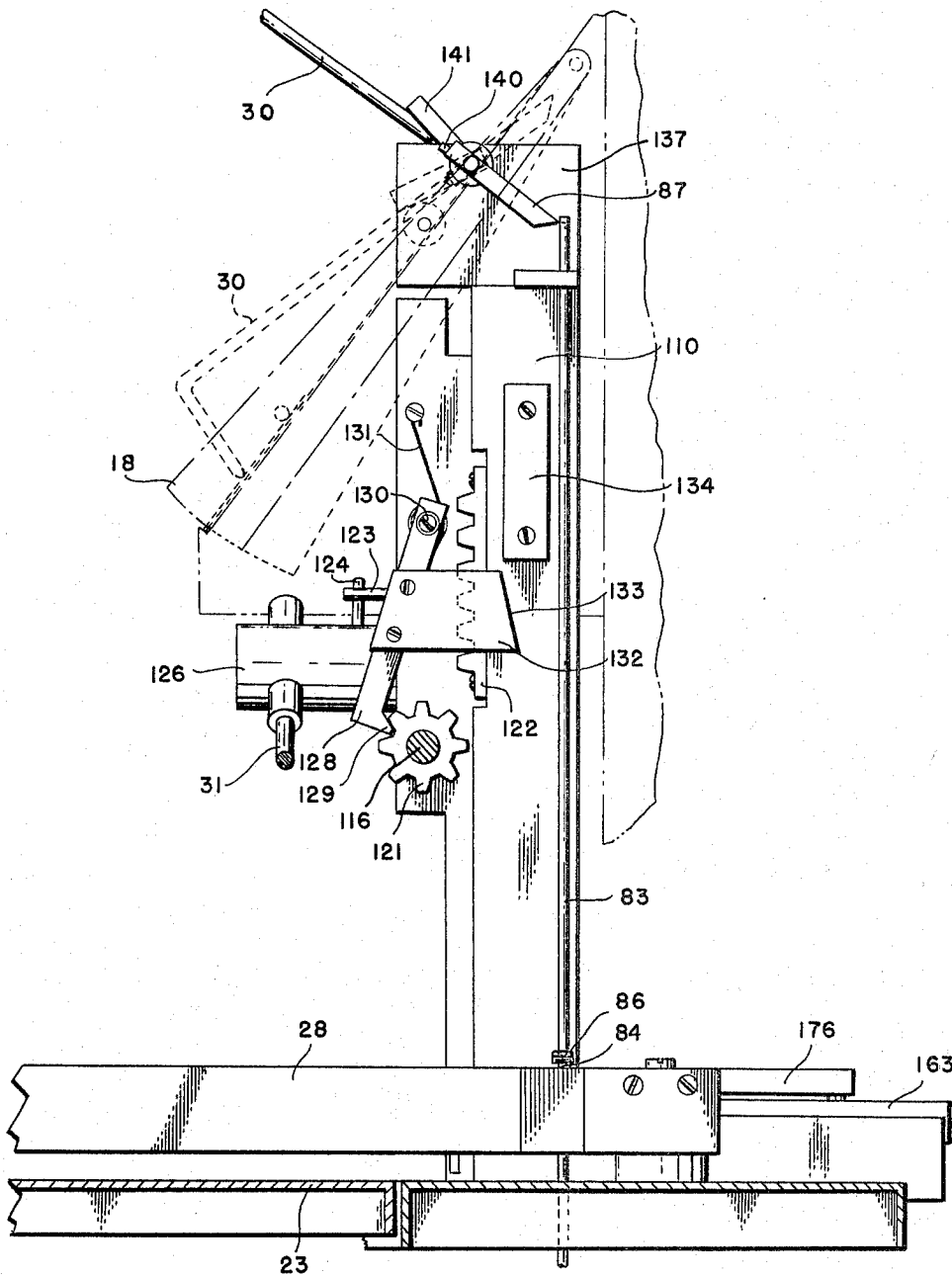
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Fig. 14

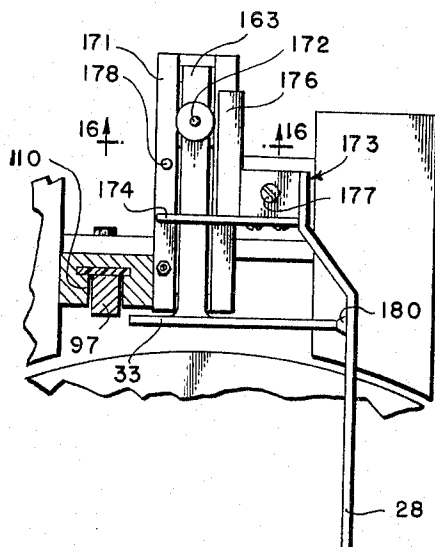


Fig. 15

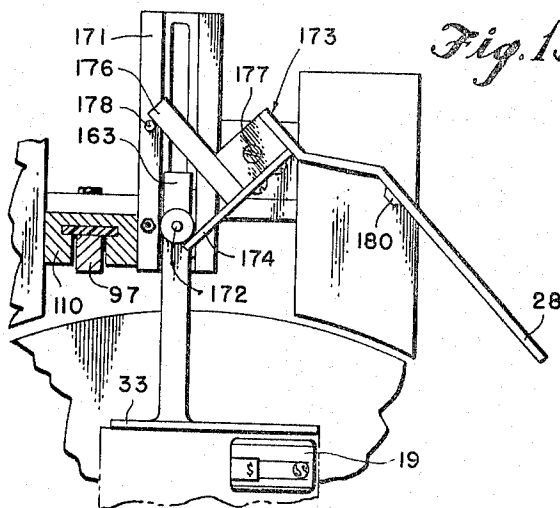


Fig. 16

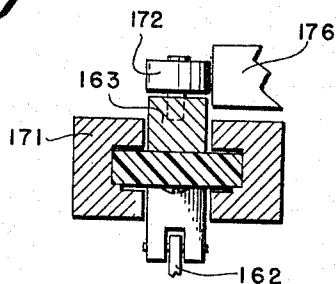


Fig. 18

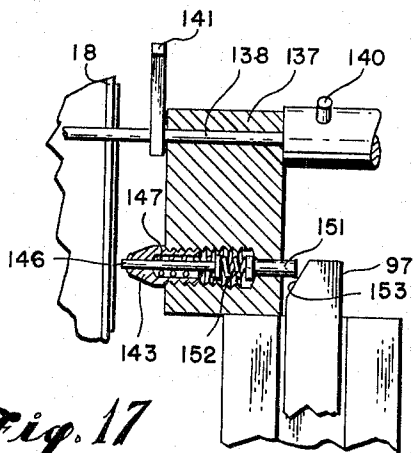
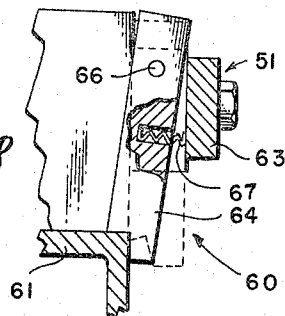


Fig. 17

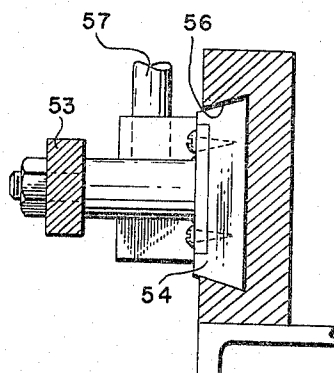


Fig. 19

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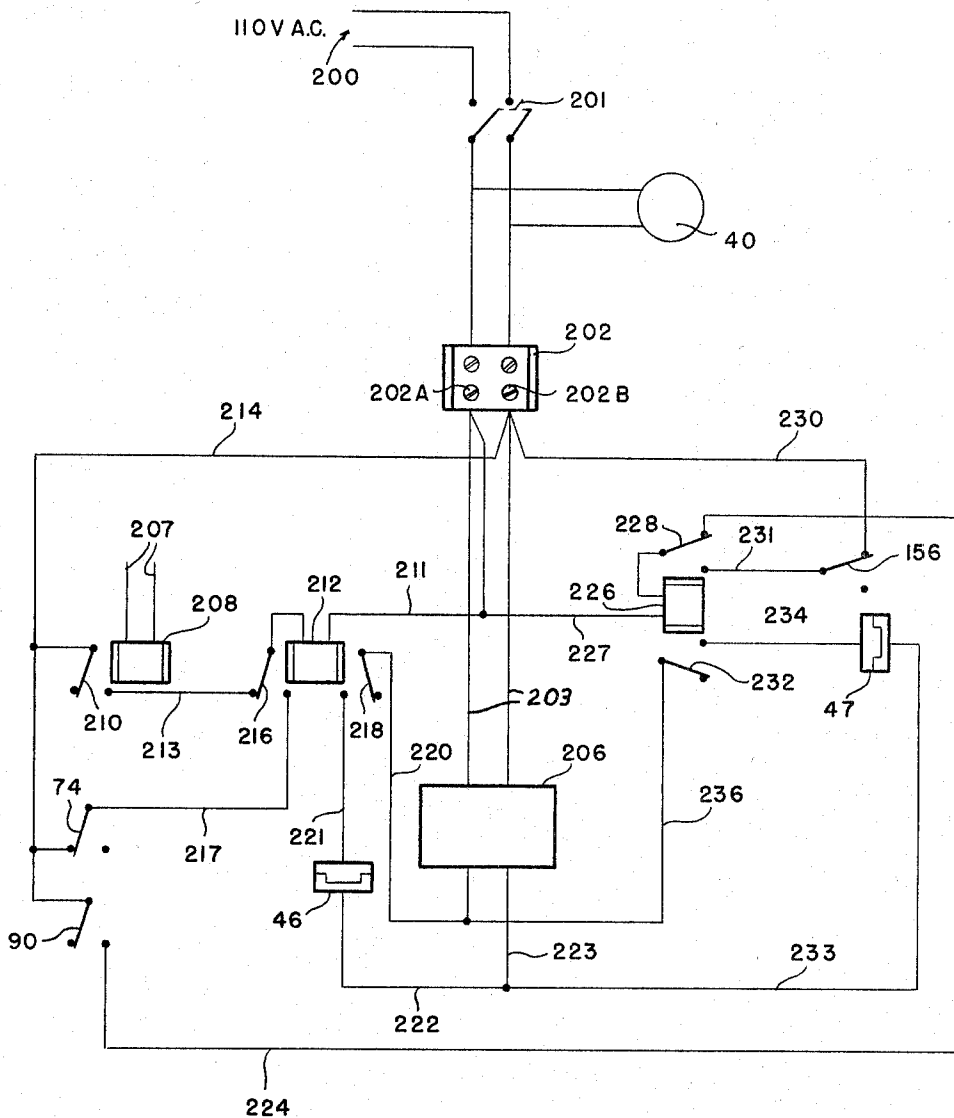


Fig. 20

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LABELING MACHINE

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3 Claims. (Cl. 156—566)

This invention relates to the art of labeling, and more particularly to a method and apparatus for the application of labels to packages of varying sizes and shapes, such as packages of meat, where each label is prepared individually to display on its package the weight and price of the meat contained therein.

The prior art provides a method and apparatus for mechanically packaging meat and depositing such packaged meat onto a scale. Operatively connected to this scale is a prior art machine which, in response to the weighing of the packaged meat, produces a label on which is printed not only the weight and per-pound price, but also the product of these two, which is the price of the meat in that particular package, the apparatus being pre-set according to the per-pound price of the particular cut of the run of meat then being wrapped in packages.

Both the scale and label producing machine are incorporated into the apparatus of the present invention, which acts to push the package from its weighing station on the scale onto a rotating table, which carries the package to a labeling station where a hold arm halts the package while the table continues to rotate therebeneath. The label producing machine has by this time already discharged the label for this package into a holding frame where a heating element causes the heat sensitive adhering surface of the label to become adhesive. A small drop arm depresses the label against the heating element to insure proper contact therewith during this brief heating period. As the package arrives at its labeling station, the drop arm lifts away from the label, and a pick-up arm swings across to contact the adhesive surface of the label and carry the label onto the top surface of the package.

A brush, which has previously swung to an out-of-the-way position to allow the pick-up arm to carry the label onto the package, now swings to a position over the package and then descends to press with a moderate force the label onto the package. As the brush makes contact with the package, a kick-out mechanism pushes the package forward so that the brush wipes over the label and so that the pick-up arm slips from beneath the label. At the completion of this wiping action, the hold arm is moved away from the package, and the continuously rotating table carries the package to a stationary deflecting arm which diverts the package onto a discharge ramp.

Thus it is a principle object of the present invention to provide both a process and apparatus by which it is possible to quickly and properly apply individual labels to packages, according to the aforescribed operating sequence.

Prior to the advent of the machine of this invention, the labeling operation has been largely performed by hand. Machines for the purpose of labeling vari-sized packages have been heretofore devised, but the working mechanisms have been quite complicated, requiring that the same be marketed at a high figure.

Thus it is also an object to provide a machine which so accomplishes the labeling of the packages that the component parts of the machine may be manufactured and assembled quite economically, and which performs its intended functions with reliability and a minimum of maintenance costs.

Other more particular objects and advantages of the invention will, with the foregoing, appear and be under-

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stood in the course of the following description and claims, the invention consisting in the novel construction and in the adaptation and combination of parts hereinafter described and claimed.

In the accompanying drawings:

FIGURE 1 is a front elevational view of a labeling machine embodying preferred teachings of my invention.

FIG. 2 is a fragmentary top plan view thereof.

FIG. 3 is a fragmentary view taken in horizontal section along line 3—3 of FIG. 1.

FIG. 4 is a fragmentary transverse sectional view taken on line 4—4 of FIG. 3.

FIG. 5 is a fragmentary rear elevational view taken on line 5—5 of FIG. 2.

FIG. 6 is a fragmentary transverse sectional view showing the labeling mechanism in the initial stage of its cyclic operation, with the brush first beginning to raise, this view being taken from a transverse plane indicated at line 6—6 of FIG. 3.

FIG. 7 is a view similar to that of FIG. 6, showing the labeling mechanism in an intermediate stage of operation, with the brush being out of the way and the pick-up arm moved over to make initial contact with the label.

FIG. 8 is a view also similar to FIG. 6, showing the labeling mechanism at a later stage of its cyclic operation, with the brush being moved to a position to wipe over the label which has been carried onto the package by the pick-up arm.

FIG. 9 is a view taken on the same plane as is FIG. 6, and drawn to an enlarged scale to detail the mechanism circled at 9 in FIG. 6.

FIG. 10 is a fragmentary sectional view taken on line 10—10 of FIG. 9.

FIG. 11 is a fragmentary sectional view taken on line 11—11 of FIG. 7, and illustrating the gear and ratchet mechanism for the pick-up arm.

FIG. 12 is a fragmentary sectional view taken on line 12—12 of FIG. 8.

FIG. 13 is a fragmentary longitudinal sectional view taken on line 13—13 of FIG. 6, and showing in full lines the label depressing arm in raised position and in broken lines in a position to engage the label.

FIG. 14 is a fragmentary view in horizontal section taken on line 14—14 of FIG. 1, and drawn to an enlarged scale with respect thereto, this view showing the package holding mechanism in its initial hold position.

FIG. 15 is a view similar to FIG. 14, showing this same mechanism near the end of its cyclic operation, with the package being pushed forwardly and the hold arm being swung out to a release position.

FIG. 16 is a transverse sectional view taken on line 15—15 of FIG. 14.

FIG. 17 is a fragmentary transverse view partly in section, detailing the holding pin mechanism for the label containing frame.

FIG. 18 is a fragmentary sectional view taken on line 18—18 of FIG. 1 and drawn to an enlarged scale.

FIG. 19 is a fragmentary sectional view, taken on line 19—19 of FIG. 1 and drawn to an enlarged scale; and

FIG. 20 is a schematic wiring diagram for the electrical apparatus of my invention.

Referring to the accompanying drawings, numeral 10 designates a table-like frame comprising four corner support legs 11 and a lower and upper platform-like portion, designated 12 and 13, respectively. This frame is so designed that it is comparatively narrow from front to rear, having its greatest dimension between the sides. The lower platform 12 supports the drive and actuating mechanism of the machine while the components which directly perform the aforescribed steps of the labeling

operation in response to this actuating mechanism are carried by the upper platform 13.

Located on the left hand portion of the upper frame platform 13 is a scale (indicated schematically at 14) having a weighing platform 16. A label dispensing machine 17 (shown for the most part schematically) is located immediately to the right of this scale and at a rear center location on the upper frame platform 13. At the front upper right hand portion of this dispensing machine is a three-sided label holding frame 18 which defines a forwardly and downwardly sloping trough into which is deposited a label 19, with the weight and price information displayed on the downturned surface of the label, and the adhesive surface of the label facing upwardly.

A properly wrapped package, indicated generally by numeral 20, is deposited at 20a by a suitable conveying mechanism (not shown) onto the weighing platform 16. A sweep arm 21 is located a moderate distance above this platform, and, in its pre-operating position, is just to the left of the platform (as shown in full lines of FIG. 2). After the weight of the package is recorded by the scale and communicated automatically to the label dispensing machine 17, the arm 21 sweeps across the weighing platform (shown in broken lines at 21' in FIG. 2) to push the package onto a transfer ramp 22 which slopes from the weighing platform downwardly to the right to terminate at a level just above a circular rotating table 23. As the package (shown now at 20b) slides down this ramp, it is properly directed onto the rotating table by a guide arm 24, adjustably mounted on the ramp and held at a selected location thereon by means of a screw 26 which fits in a longitudinal slot 27 in this ramp. The continuous clockwise rotation of the table 23 then carries the package through about ninety degrees of travel to its labeling station where a hold arm 28, projecting radially inward over the rear portion of the table, halts the package at a location shown at 20c.

During this period when the package has moved from its weighing station on the scale to its labeling station, the label for this package has been dispensed (with its printed surface facing downward) into the holding frame 18, where a drop arm 30 falls to depress the label against a heating element (not shown) on the floor of the trough defined by this label holding frame. This brief contact with the heating element serves to make the heat sensitive upwardly facing surface of the label properly adhesive.

Shown respectively at 31 and 32 are a pick-up arm which serves to carry the label from the holding frame 18 onto the package, and a brush which presses the label against the package so that it will properly adhere thereto. The interaction of these two members with their actuating members will be described hereinafter in some detail, but it will be sufficient to here indicate only the co-operating action of these two. Both the brush and the pick-up arm have already been moved upwardly a moderate distance at the completion of the previous cycle of operation to an approximate position shown at FIG. 6 to permit the package to move to its labeling station. As the package is being moved to the labeling station, first the brush 32 swings on a transverse horizontal axis upwardly and rearwardly. When the brush has swung back to sufficient distance, the pick-up arm is clear to swing on a longitudinal axis upwardly and to the left, and then down to contact the upper adhesive surface of the label in the holding frame 18. Then the pick-up arm and the brush follow these same motions in reverse order, the pick-up arm first swinging to a location over the package now at its labeling station, and the brush then swinging forward to a location over the pick-up arm (which, by virtue of its 180° swing movement, now carries the label with its adhesive surface facing downwardly). The brush and the pick-up arm, with its label, now move together downwardly onto the package.

As the label contacts the package and the brush 32 presses the label onto the package, a kick-out bar 33, normally located in retracted position (as in FIG. 14), now moves forward (to a location shown in FIG. 15) to push the package forward toward the center of the rotating table. With the brush remaining stationary, this forward motion of the package causes the brush, in effect, to wipe over the label, which is thus caused to properly adhere to the package. As this kick-out bar 33 nears its end limit of forward travel, the hold arm 28 swings away from the package (as shown in FIG. 15) to permit the rotating table 23 to carry the package through another ninety (90°) degrees of travel. Here the package strikes a deflecting bar 34, located slightly above the table, which bar diverts the package (shown at 20d) off the rotating table and onto an adjacent discharge ramp 36 located to the right of the table 23.

Proceeding now to a description of the drive and actuating mechanism of the machine, there is mounted on the right hand portion of the lower platform 12 of the supporting frame 10 an electric motor 40, which, during the operation of this machine continuously turns a longitudinal drive shaft 41 in a clockwise direction, which shaft extends both forwardly and rearwardly of the motor. The forward extension of this shaft has, at its middle portion, by means of a suitable transmission (the housing for which is indicated at 42), positive engagement with a vertical shaft 43. This shaft extends through the upper frame portion 13, where it obtains bearing support at 44, to connect to the center of the circular table 23 so as to cause this table to continuously rotate during the operation of the machine. The forward and rear ends of the shaft 41 are operatively connected to front and rear magnetic clutches 46 and 47, respectively.

The engagement of this front magnetic clutch 46 occurs in response to an electric impulse which is emitted from the label dispensing machine 17 at the time this machine records and prints on a label the weight and price of the package 20. This engagement initiates one cycle of the labeling operation (the first step being the pushing of the package from the scale platform), and is immediately responsible for four functions. First, the sweep arm 21 is caused to move the package off the scale; second, the drop arm 30 is released so as to fall on the label; third, the rear clutch 47 is caused to become engaged to actuate other members to complete the labeling operation; and fourth, the clutch 46 trips a switch to disengage itself.

With regard to the first of these functions, there is extending forwardly from, and rigidly attached to, the driven component 49 of the front magnetic clutch 46, a shaft 48, which is an axial prolongation of the drive shaft 41. This shaft is journaled within a bearing member at 50 and is rigidly attached at its forward end to a crank 51, the end of which is pivotally secured at 52 to one end of a rod 53. The opposite (i.e. left hand) end of this rod is secured to a block 54 (see FIG. 19) mounted for reciprocal slide motion in a horizontal, laterally extending slide-way 56, located at the front left hand side of the lower frame portion 12. Rigidly secured to this block 54 is a riser arm 57 which reaches above the scale platform 16 to be firmly fastened at an elbow 58 to the aforementioned push arm 21. The pre-operating position of the crank arm (i.e. the position at the beginning of the cyclic labeling operation) is (as shown in FIG. 1) extending laterally to the left, so that in a cycle of operation, one clockwise revolution of the shaft 48 with its crank 51 causes the slide block 54 to reciprocate once so as to move the sweep arm 21 across the weighing platform and then back to its rest position at the left of the weighing platform.

To hold the crank in its horizontal rest position after such a cyclic revolution of the crank, there is provided a catch mechanism 60 (see FIG. 18) to engage the front angle iron of the lower frame portion 12. To provide for this catch mechanism the crank 51 is formed as two

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aligned overlapping members, the inner member 62 being secured to shaft 48, and the outer front member 63 fronting the inner member and being bolted thereto. The catch member 64 is pivoted at 66 to the inner member 62, and a spring 67 in the catch member presses against the outer crank member 63 to urge the lower end of the catch rearwardly to extend over the front angle iron 61. Thus as the crank moves upwardly near the end of one cycle of operation, the catch will strike the angle iron 61 so as to be pushed forward. After the catch passes the angle iron, it will spring rearwardly over this front angle iron 61 to prevent the crank from dropping below a horizontal position when the magnetic clutch 46 is released at the completion of an operating cycle.

Proceeding to the aforementioned remaining three functions of this front clutch 46 (i.e. releasing the drop arm 30, engaging the rear clutch 47 and then disengaging itself), there is rigidly secured to the driven component 49 of the front clutch a cam 70 having a protrusion 71 extending along approximately seventy degrees of the peripheral cam surface. Extending rearwardly from this protrusion is a finger 72. In normal, pre-operating position, this finger is located just forward of (i.e. clockwise of) an operating lever 73 of a front clutch disengaging switch 74. Thus, when the front clutch 46 becomes engaged in response to the impulse from the label dispenser 17, just before the completion of one clockwise revolution of the driven clutch component 49, this finger 72 trips the lever 73 to disengage the clutch 46. The momentum of the driven clutch component 49 with its crank arms 51 is sufficient to carry the crank arm slightly above the front angle member 61, so that as the crank arm drops slightly the catch mechanism 60 holds the crank in its horizontal pre-operating position.

About half-way through the cycle of revolution of the driven clutch component 49, the cam finger 72 moves a lever 76 (to a location shown in broken lines in FIG. 4), which lever depends from its pivot at 77 near the upper frame portion 13. This lever is secured at its pivot to a longitudinal rod 78 which extends to the rear of the frame. Rigidly secured to the rear of this rod 78 is a collar 80 having a reentrant cut-out which produces a downwardly facing shoulder 81 (see FIGS. 9 and 10), that engages in the manner of a lever the top surface of a collar 82 rigidly secured to the lower end of an upstanding rod 83 (see FIGS. 9 and 10). When the finger 72 moves the lever 76 to the right, the resultant counter-clockwise movement of the lever collar 80 depresses the collar and rod 82-83, against the force of a compression spring 84 sleeved on this rod 83 and pressing upwardly against a protuberance 86 on the rod 83 (see FIG. 6). This action pulls the upper end of the rod 84 away from a hold finger 87 to release the label depressing drop arm 30 (this latter function to be described subsequently in more detail). Thus it can be seen that as the sweep arm 21 has pushed the package 20 onto the transfer ramp (which occurs at the time the driven clutch component 49 has completed a half revolution), the drop arm 30 falls on the label, which has first been dispensed into the holding frame 18, to depress the label against the heating element in the floor of the trough defined by this frame.

At approximately the three quarter point of the cyclic revolution of the driven clutch component 49, the cam protrusion 71 engages an operating lever 88 of a second switch 90 which causes the rear magnetic clutch 47 to become engaged. This clutch, as does the clutch 46, moves its driven component through one revolution in the operating cycle of this machine.

Proceeding now to a description of the portion of the actuating and control mechanism which is powered through the rear magnetic clutch 47, the driven component (not shown) of this clutch is rigidly secured to a shaft 91 which is a rearwardly extending axial prolongation of the drive shaft 41. This shaft 91 obtains

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bearing support from the lower frame portion 12 at 92 and 93, and has at its midlength a cam 94 and at its extreme rear another cam 96. The cam 94 functions to raise and lower an operating head 97 (to be described hereinafter in detail) so as to move the pick-up arm 31 and the brush 32 according to their aforescribed operating pattern, and the rear cam 96 functions to operate the kick-out bar 33 and to release the hold arm 28.

Referring now to FIGURES 6, 7, 8, which illustrate the cam 94 and its associated operating head in three successive stages of operation, it can be seen that the cam has a peripheral cam surface 98, and has reaching over a portion of this cam surface a curved lip 100 which forms with such surface a cam groove 101, which acts to control the movement of the head 97 at its upper limit of travel. The follower arm 102 for this cam has at its mid-length a roller 103 to engage the cam surface, and is pivoted at its right end to the supporting frame at 104 while its left end is pivotally connected through a shackle 106 to the lower end of a vertical bar 107, whose upper end is attached to, or made integral with, the head 97.

This head 97 is mounted for vertical slide motion in a forwardly facing trough 108 defined by a channel-like slideway 110 rigidly secured to, and reaching above and below, the upper frame portion 13. The head 97 is conveniently made with a rear tongue portion 111 which fits into opposed vertical slots 112 located in the side walls of the trough, and a front piece 113 which is located just forward of the slideway 110. Both the pick-up arm 31 and the brush 32 are pivotally mounted on the head, the arm being positioned in front of the head with its pivot shaft 114 extending longitudinally there-through, and the brush being located first to the right of the head with its pivot shaft 116 extended transversely herein.

Rigidly secured to the rear of the pick-up arm shaft 114 is a pinion 117 which, when the head 97 is near its upper limit of travel, engages a vertical gear rack 118, located along the left-hand side wall 120 of the slideway trough 108 (see FIG. 11). A second pinion 121 is rigidly secured to the brush shaft 116 to similarly engage a second gear rack 122 secured to the right front face of the slideway.

These gear racks are so arranged that for the first portion of upward vertical travel of the head 97 neither gear is engaged. Near the upper limit of travel of the head 97, however, the gear 121 first engages its rack 122 and rotates about a quarter of a revolution before the gear 117 becomes engaged. The effect of this is that the brush 32 is swung upwardly along its horizontal transverse axis nearly 90° before the pick-up arm 31 begins its counter-clockwise swing motion about its longitudinal axis to contact the label 19 in the holding frame 18. Also as the head 97 begins its descent, the arm 31, now carrying the label will be caused to swing along its return path to arrive first at a position over the package 20c at its labeling station, and the brush 32 will arrive at its position over the pick-up arm shortly thereafter.

Protruding forwardly from the head 97 and located slightly above the pick-up arm pivot shaft 114 is a stop pin 123 which is arranged to engage a finger 124 fixed to a member 126 secured to the front of the pick-up arm shaft 114, so that this arm 31 will be held horizontally over the package 20 at its labeling station. To lock the brush 32 in its wiping position (i.e. with its bristles 127 extending downwardly), there is a pawl 128 having at its lower end a tooth 129 to engage the pinion 121, the pawl being pivotally mounted at its upper end at 130 on the head 97 at a location above the shaft 116. A spring 131 mounted on the head 97 acts to depress the tooth 129 in dogging relationship against the pinion 121 to prevent rotation thereof. To retract the tooth 129 so as to allow the gear 121 to rotate when the head 97 is near its upper

limit of travel, there is attached to the pawl 128 a rearwardly extending cam member 132, whose rear contact surface 133 slopes downwardly and rearwardly. A plate 134, fixed to the right side of the slideway 110, contacts in a wedging fashion the surface 133 as the head 97 moves upwardly so as to push the pawl 128 forward to a release position.

Besides cooperating with the slideway 110 to produce the particular coacting movements of the pick-up arm 31 and brush 32, the vertical movement of the operating head 97 also serves two other functions, namely, to move the label depressing drop arm 30 up from the label 19 in the holding frame 18 so as to allow the pick-up arm to contact the label; and to operate a spring loaded catch member 136 which holds the label holding frame 18 in depressed position after the pick-up arm has contacted the label.

To describe the apparatus which accomplishes these two functions, there is located at the upper left hand side of slideway 110 a support block 137 in which is pivotally mounted about a transverse horizontal axis a rod 138 which is rigidly secured at its left end to the pivoted end of the drop arm 30. Extending radially from this rod is the aforementioned hold finger 87, which in pre-operating position is engaged by the vertical rod 83 so that the drop arm is held in its upwardly extending position (shown in full lines in FIG. 13). Also extending radially from this rod 138 are a lifting finger 140 extending over, and engaged by, the head 97 on its upward travel in a manner to lift the drop arm from the label, and a stop finger 141 reaching over the catch member 136 so that as the drop arm 30 falls to depress the label against the heating element, this finger 141 will contact the member 136 so that as the drop arm 30 falls to depress the label against the heating element, this finger 141 will contact the member 136 to cushion the fall of drop arm 30 onto the label.

To describe the functions more particularly, as previously indicated, the drop arm 30, in its pre-operating position, extends forwardly and upwardly, the arm being held in this position by the rod 83 engaging the hold finger 87. When the rod 83 is lowered by the finger 72 of the front clutch component 49 engaging the lever 76 in the aforedescribed manner, the finger 87 is released and the arm 30 falls onto the label 19, with the finger 141 performing its aforementioned cushion action by contacting the catch member 136. Shortly after this, the cam 94 begins to raise the operating head 97 which then engages the lift finger 140 to raise the drop arm to its pre-operating position, the hold finger 87 swinging downwardly to first depress the rod 83 against the action of its associated spring 84, and then allowing the rod 83 to spring up to catch the finger 87 and hold the drop arm 30 in raised position. As before stated, this drop arm must be raised from the label to allow the pick-up arm to swing over to engage the label.

With regard to the aforementioned catch member 136, as the pick-up arm 31 descends onto the label, this arm depresses the holding frame 18 into the label dispensing machine so that the arm may make proper contact with the label. As the pick-up arm is lifting the label from the frame 18, the catch member 136 holds this frame in its depressed position until the label is completely free of the frame, at which time the operating head 97 is descending to allow the catch mechanism to return to its release position and permit a spring mechanism (not shown) within the label dispensing machine to raise the frame 18 to its pre-operating position.

To describe this action more fully (referring now to FIG. 17), threaded into a socket in the support block 137 is a nipple 143 having a relatively small front opening to accommodate a catch pin 146, which extends there-through. This opening leads into larger rear nipple opening which in turn opens to the socket and accommodates a relatively small compression spring 147 sleeved onto the catch pin 146. This spring 147 bears against a head flange formed at the rear of the catch pin 146 and also

bears against the forward portion of the nipple. At the base of the socket there is formed in the support block 137 a through opening which accommodates a plunger pin 151 that extends rearwardly over the operating head 97, and whose head bears against a relatively heavy compression spring 152, positioned in the socket and bearing in turn against the head flange of the catch pin 146.

The top left hand portion of the head 97 is beveled at 153, so that as the head begins its ascent at the beginning of its operating cycle, the plunger pin 151 will be pressed inwardly against the larger spring 152 to move the catch pin 146 against the side of the holding frame 18 so as to compress the smaller spring 147 to some extent. When the pick-up arm 31 depresses the holding frame, the catch pin 146 springs over the frame, thus preventing this frame from rising as the pick-up arm carries the label from the frame. The head flange of the pin 146 engages the rear of the nipple 143 to limit the outward movement of the catch pin. The descent of the operating head below the level of the plunger pin 151 allows the plunger pin to spring out to relieve the force of the spring 152 on the catch pin 146 and allow the smaller spring 147 to retract the catch pin and allow the holding frame 18 to spring up into its preoperating position.

It is believed that clarity in understanding of the invention will be attained by here tracing the sequence of operation of these aforedescribed components whose operating movements are caused by the vertical movement of the operating head 97.

Referring now to FIG. 6, it can be seen that the cam 94 has not begun the clock-wise travel of its cyclic revolution. The drop arm 30 first falls onto the label 19 before the cam 94 begins its movement. When the cam 94 begins to move by virtue of the rear magnetic clutch 47 becoming engaged, the pick-up arm 31 and brush 32 begin to move upwardly a short distance, and the brush pinion 121 first begins to engage its rack 122.

In the showing of FIG. 7, the cam 94 has entered into the second quarter of its cycle of revolution. The head 97 has been raised sufficiently to depress the plunger pin 151 of the holding frame catch mechanism 136 and has also engaged the lift finger 140 to lift the drop arm 30 to its raised pre-operating position. Also the brush pinion 121 has traveled along its rack 122 sufficiently to rotate the brush 32 up to an out-of-the-way position, while just prior to this the cam member 132 by engaging the plate 134 has pushed the pawl 128 to release position. After the brush 32 had been raised somewhat less than a quarter revolution, the pinion 117 engaged its rack 118 to swing the pick-up arm 180° to contact the label 19. Although in the showing of FIG. 7, for clarity of illustration the brush 32 is shown as having been rotated somewhat less than 180°, in actuality, it will have swung nearly 270°. This arm 31, in contacting the label, also has depressed the label holding frame 18 to a location where the catch pin 146 was enabled to spring out to hold this frame in this depressed position.

In FIG. 8, the cam 94 has entered into the final half of its cycle of revolution. The pick-up arm 31 has carried the label 19 through 180° of travel to a location over the package at 20c, and the brush 32 has swung to a position over the package, with its bristles 127 extending downwardly, the pawl 128 now having engaged the locking pinion 121 in dogging relationship therewith to lock the brush relative to the head 97. Also, the head 97 has dropped so that the brush 32 now presses the label onto the top surface of the package at 20c.

At this stage of operation, the cam 94 has yet to perform one more function before completing its full operation. As this cam is completing its revolution, a finger 154, extending forwardly from the cam, trips a switch 156, which disengages the rear magnetic clutch 47, thus bringing the cams 94 and 96 to rest.

However, before such disengagement, but after the brush 32 has descended onto the package at 20c, the

rear cam 96 acts to operate the kick-out bar 33 and to move the hold arm 28 to allow the package to be carried to the deflecting bar 34 where the package is diverted onto the discharge ramp 36. The action of this cam 96 is to reciprocate through one stroke a lever 160, which is pivoted by its lower end at 161 to the supporting frame 10 and is connected at its upper end through a shackle 162 to slide block 163.

To accomplish such motion of the lever 160, the cam 96 has along its periphery both a rearwardly and forwardly facing cam surface, 164 and 166, respectively, which engage at different stages a roller 167 of the cam following lever 160. The cam surface 164 engages this roller through the first two thirds of this cam's cyclic revolution and acts to hold the lever 160 in a rearwardly extending position so as to maintain the kick-out bar 33 and hold arm 28 in the position shown in FIG. 14. At approximately this two-thirds point of the cam's revolution, the follower roller 167 is engaged by an initial portion 168 of the forwardly facing cam surface 166, this first cam surface portion being slanted at an angle with a transverse plane so that the lever 160 is caused to move forward to bring the kick-out bar and hold arm to the position shown in FIG. 15. The roller then rides along the surface 166 for a short accurate distance and then engages an initial rearwardly slanting portion of the cam surface 164 to cause the lever 160 to retract to its rest position.

To explain the cooperating action of the lever 160 with the hold arm 28 and the kick-out bar 33 referring again to FIGS. 14 and 15, it is seen that the block 163 is mounted in a longitudinally extending slideway 171 secured to the upper frame portion 13. The transverse kick-out bar 33 is rigidly secured to the front of the slide block 163, while a roller 172 is secured to the top rear portion of the slide block in a manner to operatively engage a hold arm member 173. This hold arm member is a substantial bell crank and is comprised of the hold arm 28 a lever bar 174 which is rigidly attached to, and extends to the left at right angles to the hold arm, and a limit arm 176 extending rearwardly from the approximate mid-point of the lever bar 174. The pivot 177 for this member 173 is located on the upper frame portion 13 at a point behind the hold arm 28 and the lever bar 174, and to the right of limit arm 176.

With the slide block 163 in its retracted, pre-operating position (as in FIG. 14), the lever bar 174 is positioned with its end portion a moderate distance in front of the slide-block roller 172. Thus as the slide block 163 begins its forward motion by virtue of the follower roller 167 engaging the cam surface portion 168, the kick-out bar 33 is first caused to move forward to push the package 20c forward so that the brush 32 wipes over the label 19. Near the end of the forward travel of the slide block and the kick-out bar, the slide block roller 172 engages the lever bar 174 to rotate the hold arm member 173 counter-clockwise so that the hold arm 28 swings out of the way to release the package 20c which is then carried by the rotating table 23 to the deflecting bar 34 and onto the discharge ramp 36. The limit arm 176 engages a stop pin 178 on the slideway 171 to prevent the slideblock from moving beyond the desired forward limit of travel.

As the lever roller 167 engages the cam surface 170 to retract the lever 160, the slide block 163 with its kick-out bar 33 retract, and the slide block roller 172 engages the limit arm 176 to swing the member 173 clockwise and return the hold arm 28 to its forwardly extending, pre-operating position. In such position the right end of the kick-out bar butts against the rear portion of the hold arm at 180 to prevent further clockwise swinging of the hold arm member 173, and the slide block roller 172 is adjacent the limit arm 176 to prevent counter-clockwise rotation of this member 173.

As the cams 94 and 96 are finishing their cycle of revolution and the finger 154 trips the switch 156 to disengage

the rear magnetic clutch 47, a catch finger 181 extending forwardly from the rear cam 96, passes by a spring loaded pin 182, mounted on the frame 10, thus depressing the pin against its spring 183 and then allowing the pin to spring out above the finger 181. This prevents the shaft 91 with its cams 94 and 96 from rotating counter-clockwise by force of gravity.

Referring now to FIG. 20, wherein is shown the wiring diagram of my invention, a 110 volt A.C. power source 200 feeds power through a double-pole switch 201 to a terminal block 202 and also to the aforementioned motor 40. Leads 203 feed current from the two sides of the terminal block 202a and 202b respectively to a 90 volt D.C. rectifier 206.

When a package is weighed on the scale and this weight is communicated to the label dispensing machine 17, an impulse is fed through wires 207 to a relay 208, causing the relay switch 210 to seal, so that current flows from one side 202a of the terminal block through lead 211, thence through relay 212, and through lines 213 and 214 to the other side 202b of the terminal block. This causes the relay switch 216 to break the flow of current through lines 211, 213 and 214, and cause current to flow through line 214, thence through the aforementioned normally closed switch 74, through line 217, relay 212, and line 211 to the other side of the terminal block 202, so as to hold relay 212 closed.

The initial closing of relay 212 also seals the relay switch 218, so as to cause current to flow from the rectifier 206 through lines 220 and 221, thence through the aforementioned front magnetic clutch 46 and back through lines 222 and 223 to the rectifier 206. After the driven component 49 of clutch 46 makes one cyclic revolution, the aforementioned finger 72 attached to this clutch component causes the switch 74 to open, thus releasing relay 212 so as to allow relay switch 218 to open and disengage the front magnetic clutch 46.

During the rotation of the driven component 49 of the front magnetic clutch 46, the aforementioned cam protrusion 71 of this driven clutch component causes the aforementioned normally open switch 90 to close, so that current flows through line 214, switch 90, line 224, through relay 226 and through line 227 to terminal block 202. This causes the relay switch 228 to move so as to break this last-mentioned current flow and to allow current to flow from the terminal block through line 230, thence through the aforementioned normally closed switch 156, thence through line 231, through relay 226 and line 227, back to terminal block 202, thus holding relay 226 closed.

The closing of his relay 226 also seals relay switch 232, so as to cause current to flow from the rectifier 206 through lines 223 and 233, through the aforementioned rear magnetic clutch 47 and thence through lines 234 and 236 back to rectifier 206. This causes the clutch 47 to become engaged to move the aforementioned cam members 94 and 96 through one cycle of revolution, at the end of which the aforementioned finger 154 on the cam 96 causes switch 156 to open momentarily so that relay 226 drops out, thus causing the rear magnetic clutch 47 to come to rest.

To summarize the operation of my invention, a properly wrapped package is deposited at 20a by suitable means onto the weighing platform 16 of a scale 14. As the scale registers the weight of the package and communicates this to the label dispensing machine 17, this machine 17 prints a label containing the price and weight information thereon and also emits an electrical impulse which causes the engagement of the front magnetic clutch 46 to the drive shaft 41 of the motor 40. The engagement of this clutch immediately causes the driven shaft 48 to rotate through one cycle of revolution so as to cause the sweep arm 21 to move across the weighing platform and push the package onto the transfer ramp 22 and then return to its pre-operating position at the left-hand side of the scale platform 16.

During this time, a label 19 has been deposited onto the label-holding frame 18, with its printed surface facing downwardly, and its adhesive surface facing upwardly. Approximately half-way through the revolution of the shaft 48, a finger 72 on the driven clutch member 49 engages a lever 76 which causes the drop arm 30 to fall on the label 19 so as to depress this label against a heating element lying on the floor of the trough defined by the label-holding frame 18.

At about the three-quarter point of the revolution of the driven clutch component 49, the cam protrusion 71 engages the switch 90 so as to cause the rear magnetic clutch 47 to become engaged and travel through one cycle of revolution. As the driven clutch component 49 completes its cycle of revolution, the finger 72 opens the switch 74 momentarily causing relay 212 to drop out so that the clutch 46 becomes disengaged, thus completing the cycle of revolution of this clutch component 49.

When the rear magnetic clutch 47 becomes engaged, so as to cause the cams 94 and 96 to go through one cycle of revolution, the cam 94 causes the operating head 97 to reciprocate through one cycle. As described previously, the reciprocation of this operating head 97 causes the brush 32 to swing upwardly and rearwardly to an out-of-the-way position and also causes the pick-up arm 31 to swing across onto the label-holding frame 18 so that this pick-up arm 31 may contact the upwardly facing adhesive face of the label 19. During this time, the top of the head 97 has engaged the lift finger 140 to raise the drop arm 30 from the label, and has also engaged the plunger pin 151 of the catch mechanism 136, so that as the drop arm depresses the label-holding frame 18, this catch mechanism 136 will keep this frame 18 in a depressed position until the pick-up arm has cleared the frame 18.

During the time the operating head is beginning its cyclic reciprocating movement, the package 20 which was swept from the weighing platform 16 has moved down the transfer ramp 22 onto the continuously rotating table 23 which carries the package to a labeling station at 20c at the rear of this rotating table, where the hold arm 28 halts the package. The package has reached this position by the time the operating head 97 begins its descent. As the operating head 97 descends, the pick-up arm carries the label 19 to a location over the package at 20c, and immediately after this the brush 32 swings forward to a position immediately above the pick-up arm. The descent of the operating head 97 also releases the catch mechanism 136 to allow the holding frame 18 to spring outwardly into place, and also allows the pawl 128 to engage the pinion 121 to lock the brush in its location directly above the label carried by the pick-up arm 31. Then the brush 32 and the pick-up arm 31, still carrying its label, descend onto the package at 20c.

At this time the cam 96 causes its cam following lever 160 to begin its cyclic reciprocation. The forward movement of this lever 160 causes the kick-out bar 33 to move forward so as to push the package at 20c forwardly from the pick-up arm 31 and brush 32. This action causes the pick-up arm 31 to slip out from under the label and also causes the brush 32, in effect, to wipe over the top surface of the label so as to cause it to properly adhere to the package. As the lever 160 nears its forward limit of travel, the hold arm 28 is caused to swing counter-clockwise so as to release the package at 20c and allow the rotating table 23 to carry the package to the right side of this table where the deflecting bar 34 diverts the package (shown at 20d) onto the discharge ramp 36.

As the lever 160 moves rearwardly on its cycle of reciprocation, the kick-out bar 33 is retracted to its pre-operating position, and the hold arm 28 is swung clockwise to its forwardly extending pre-operating position. When the lever 160 has completed its reciprocation, the

finger 154 on the cam 94 momentarily opens the switch 156 to cause the relay 226 to drop out and disengage the rear magnetic clutch 47 to complete the cyclic revolution of the cams 94 and 96. A catch finger 181 on the rear cam 96 engages a spring-loaded hold pin 182 so as to hold the cams 94 and 96 in their pre-operating position.

It is important to note that the pick-up arm 31 is of circular cross-section, the diameter of the arm being substantially less than the dimension of the label across which the arm reaches. Consequently, as the arm contacts the label, the contact area where the arm touches the adhesive surface of the label is of quite small width, the contact being in effect a line contact. Thus when the label is carried onto the package, most of the adhesive surface of the label is able to make contact with the package so that the arm 31 may be slipped from beneath the label without carrying the label along.

Also it should be noted that the adhesive material which coats the adhering surface of the label could be any one of a number of adhesives now commercially available, which are characterized in that at room temperature the adhesive has no adhering qualities, but when heated, will become properly adhesive.

It is believed that the invention will have been clearly understood from the foregoing detailed description of my now-preferred illustrated embodiment. Changes in the details of construction may be resorted to without departing from the spirit of the invention and it is accordingly any intention that no limitations be implied and that the hereto annexed claims be given the broadest interpretation to which the employed language fairly admits.

What I claim is:

1. In a labeling machine providing a table adapted to have a package stationed thereon for labeling, a carrier supported for vertical travel above the labeling station between an upper location elevated above and a lower location approximating the upper level of a package occupying the station, a pick-up arm mounted upon the carrier for reciprocal up and over swing movement about an approximately horizontal axis from a normal position extending horizontally in one lateral direction from center into and from a pick-up position extending horizontally in the other lateral direction from center, a brush also mounted upon the carrier for reciprocal swing movement from a normal position in which the same overlies the pick-up arm when the latter is in its normal position into and from a position out of the swing path of said pick-up arm, means operating when the carrier is in its elevated position for swinging the pick-up arm and the brush first moving the brush into its out-of-the-way position, then reciprocating the pick-up arm, and finally returning the brush, a frame for holding an adhesively-coated label, adhesive side up, located at the approximate upper limit of the carrier's travel in a location whereat the pick-up arm, moving to its pick-up position, is brought downwardly against the adhesive coating of the label to cause the label to adhere thereto and by its return swing transfers the label from the frame to a position overhead to the package with the adhesive side down, means made to operate when the pick-up arm and brush have completed their swing movements for operating the carrier reciprocally in its vertical motion first moving downwardly to place the label upon the package and then returning to the elevated position preparatory to initiating a following cycle of operation, and means acting upon the package while the arm is at its low position for pushing said package horizontally from beneath the arm and the brush so that the arm slips out from under the label while the brush wipes the label onto the package.

2. The machine of claim 1 in which the label-contacting surface of the pick-up arm has minimal width so that the arm easily slides from under the label when the package is pushed from beneath said arm and the brush.

3. In a machine for applying a label having an ad-

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hesively coated surface to a package at a labeling station, an operating head, pick-up means and brush means carried by said head, means for moving said head in a cyclic movement whereby said pick-up means is caused to contact the label and said brush means is caused to move to an out-of-the-way position to allow the pick-up means to contact the label, and then said pick-up means is caused to carry the label to a location with the adhesive surface of said label facing said package, and said brush means is caused to press said label onto said package so that the label will properly adhere thereto, and means for causing relative motion between said package and said brush means such as to cause the brush means to wipe across the exposed non-coated surface of said label while pressing against the label.

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