United States Patent [19]

Haifley et al.

[11] **3,815,898**

[45] **June 11, 1974**

[54] **LABEL HANDLING MECHANISM**

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[73] Assignee: **Franklin Electric Co., Inc.,** Bluffton, Ind.

[22] Filed: **May 24, 1972**

[21] Appl. No.: **256,265**

[52] **U.S. Cl.**..... **271/65,** 156/499, 156/556, 156/DIG. 36, 156/DIG. 51, 271/185, 271/207

[51] **Int. Cl.**..... **B65h 29/58,** B32b 31/00

[58] **Field of Search**... 271/65, 64, 86, 61 R, 61 TR, 271/176, 184, 185, 186, 207; 193/39; 156/499, 556, DIG. 36, 51

[56] **References Cited**

UNITED STATES PATENTS

1,525,528	2/1925	Widell	271/64 X
3,189,342	6/1965	Bocock	271/64
3,319,768	5/1967	Holzhauer et al.	193/39 X
3,321,078	5/1967	Treiber	271/61 X
3,410,552	11/1968	Collier et al.	271/65
3,612,515	10/1971	Bergeson	271/86

Primary Examiner—Evon C. Blunk
Assistant Examiner—James W. Miller
Attorney, Agent, or Firm—Hibben, Noyes & Bicknell

[57] **ABSTRACT**

This disclosure deals with a mechanism for handling a label issued by a label printing mechanism of, for example, automatic weighing, computing and labeling apparatus. Such a label has printing on one side thereof, and the label moves downwardly in a substantially vertical plane as it leaves the label printing mechanism. The mechanism includes a diverter positioned in the path of the label, the diverter deflecting the label laterally to place the printing either facing upwardly or facing downwardly. After being deflected, the label slides to a removal station where it may be picked up either manually or automatically. When the label includes a heat activatable adhesive on its side opposite the printing, the mechanism further includes a heater which may be used to activate the adhesive.

11 Claims, 12 Drawing Figures

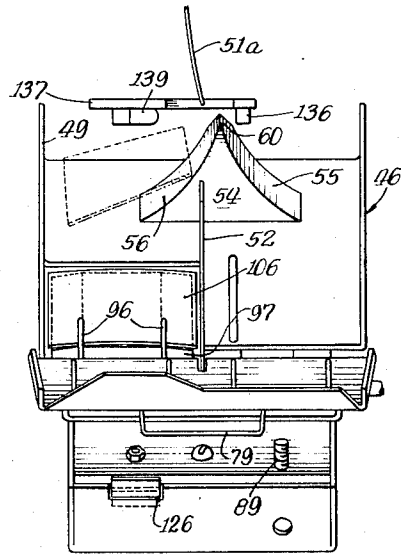
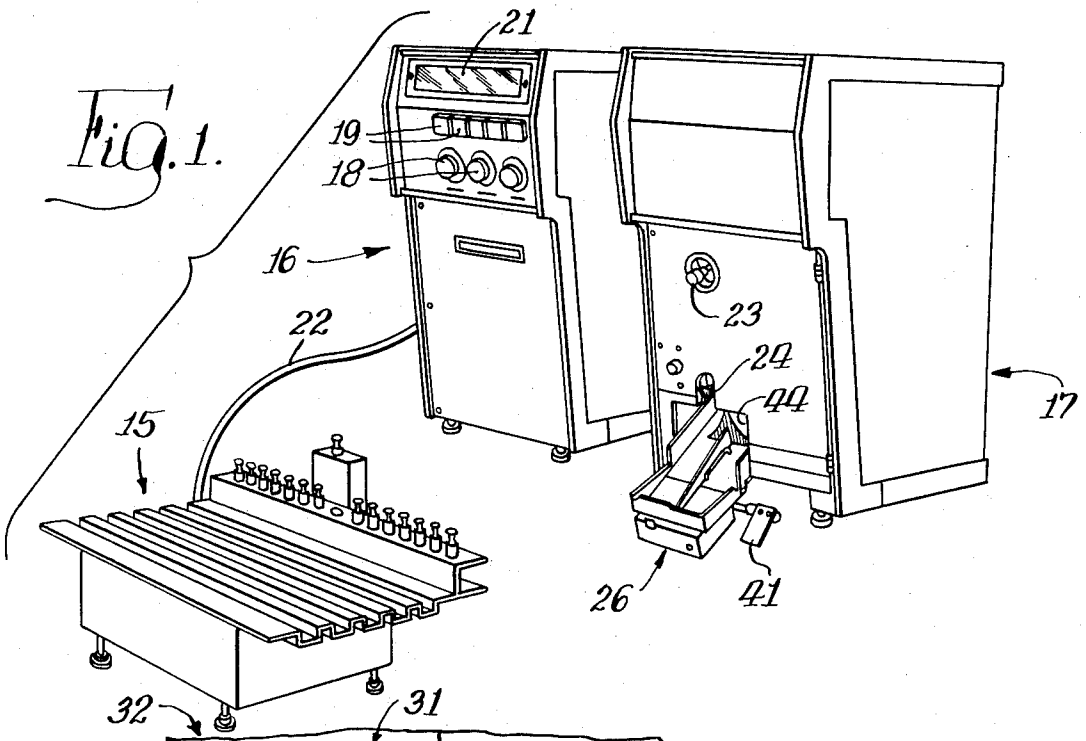


Fig. 1.



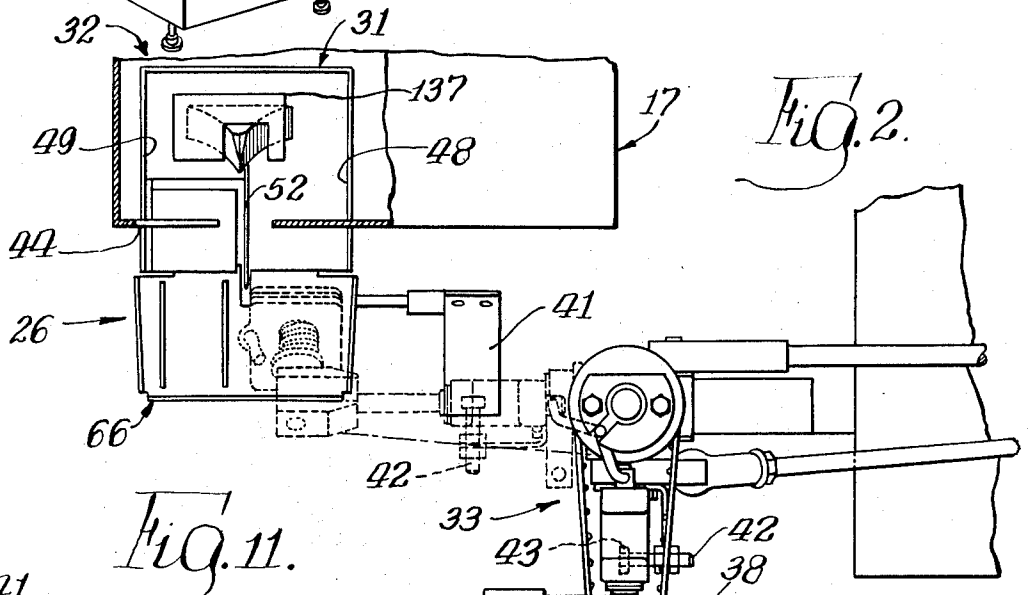
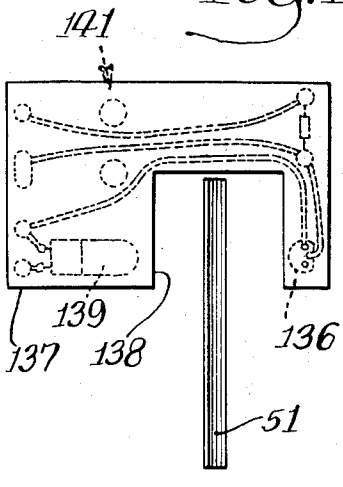


Fig. 2.

Fig. 11.



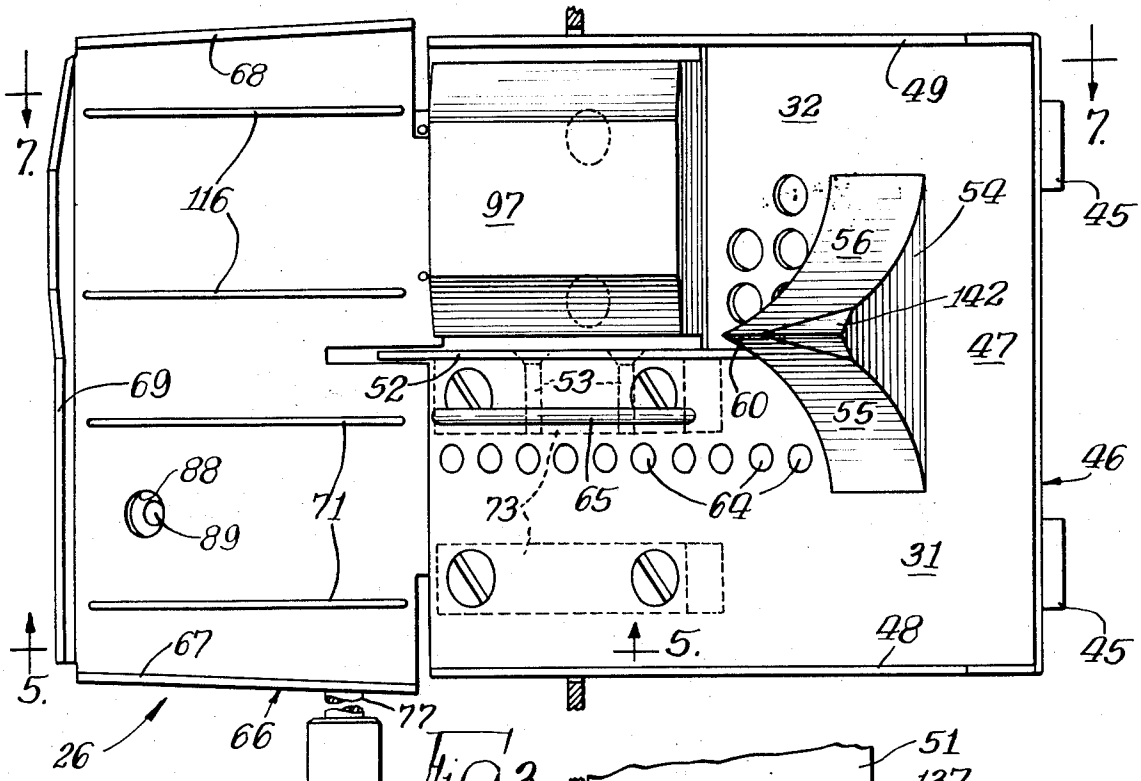

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Fig. 3.

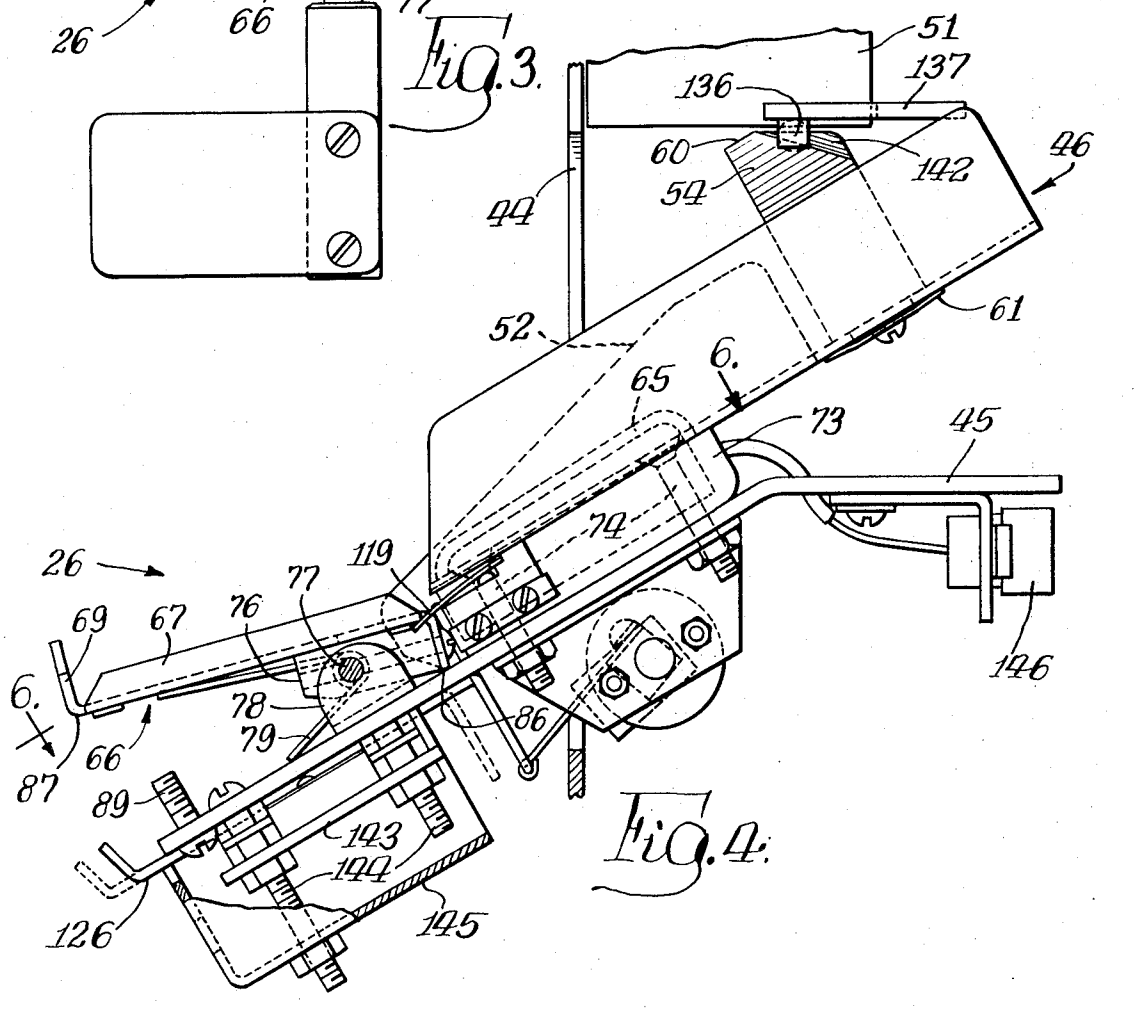

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Fig. 4.

Fig. 5.

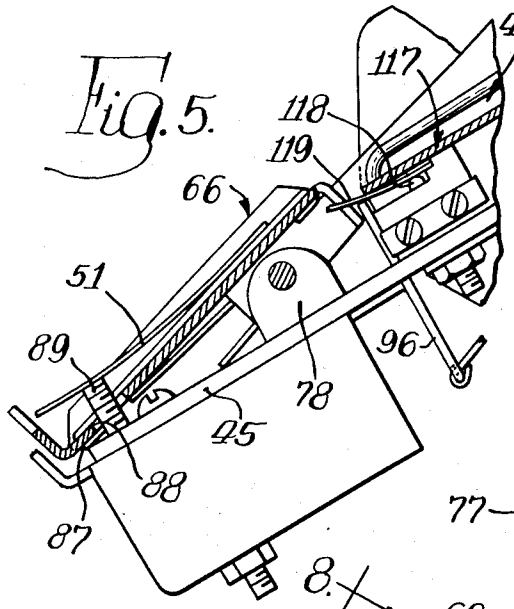
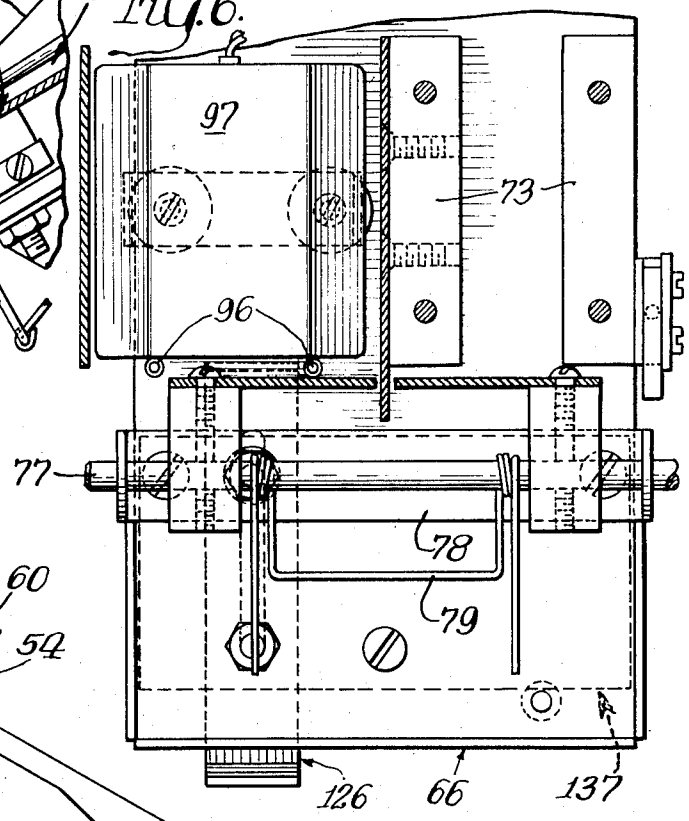


Fig. 6.



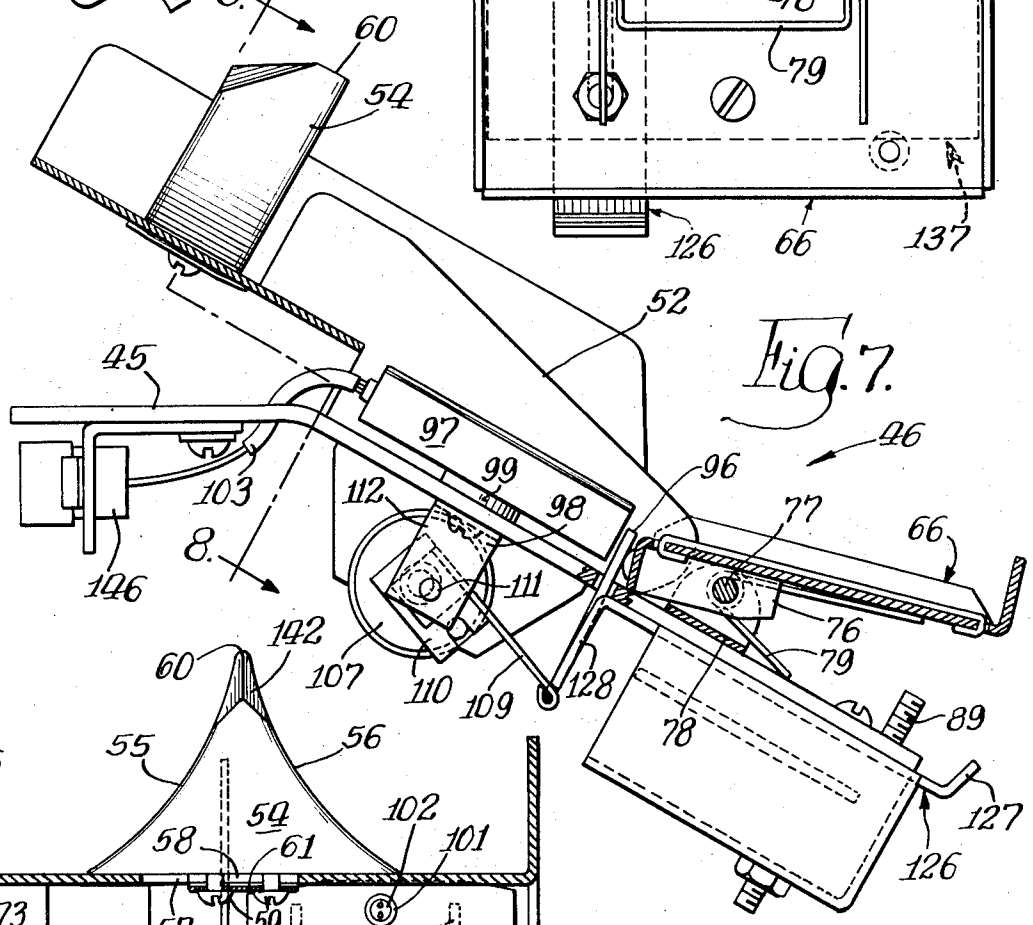


Fig. 7.

Fig. 8.

Fig. 10.

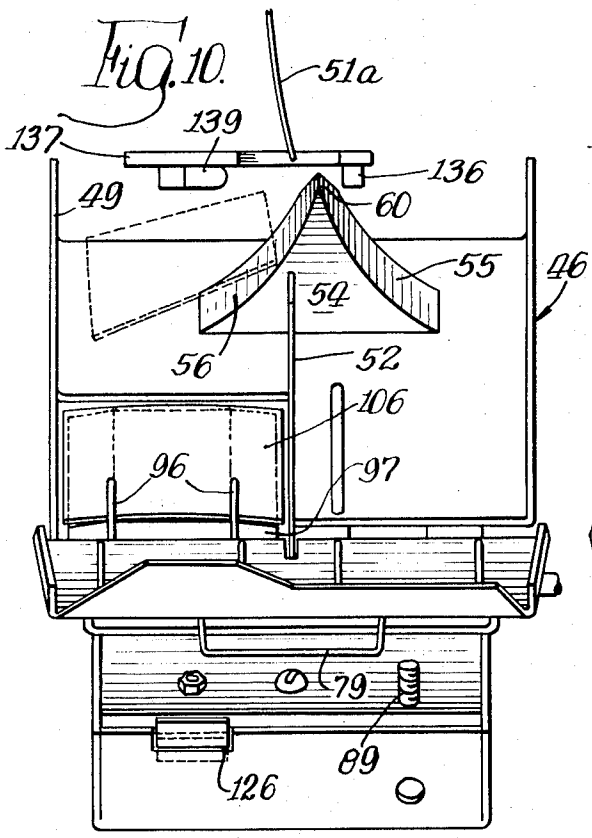
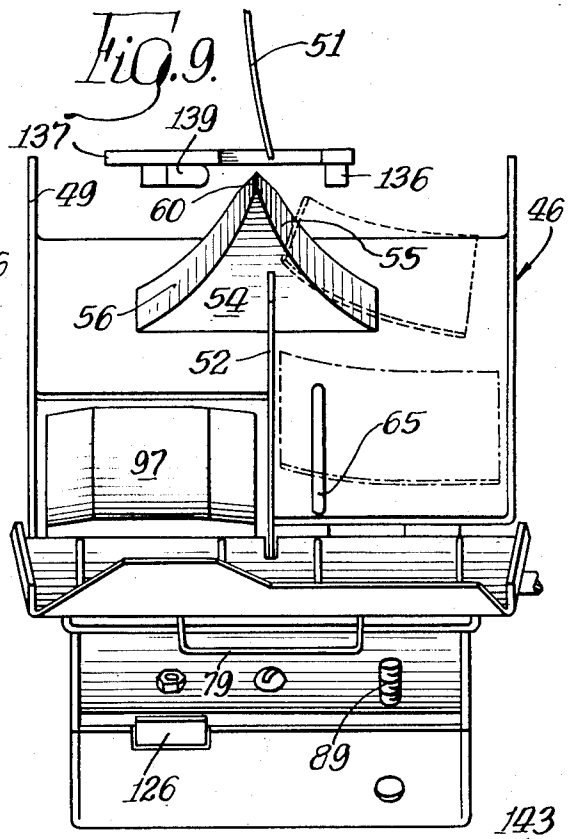


Fig. 9.



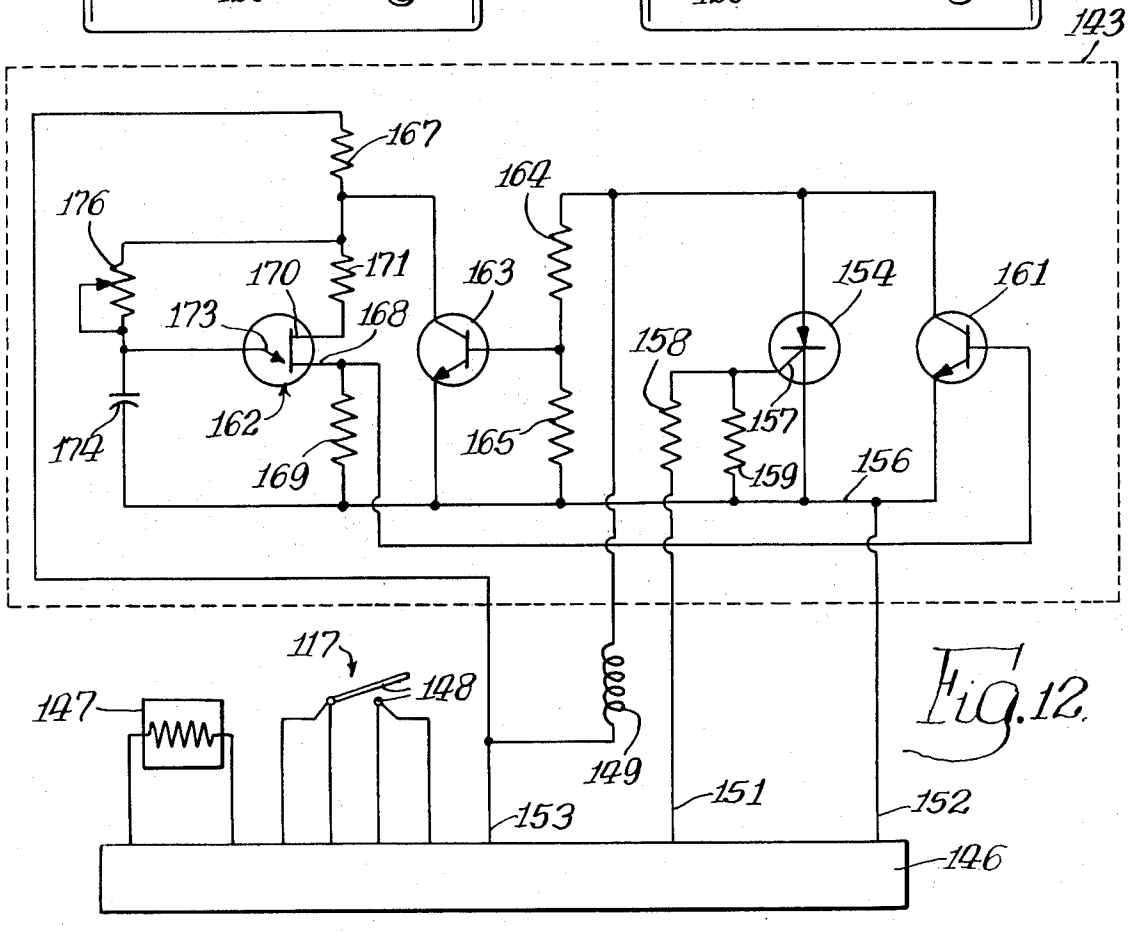


Fig. 12.

LABEL HANDLING MECHANISM

A label handling mechanism of the general character disclosed in Collier et al U.S. Pat. No. 3,410,552, dated Nov. 12, 1968, which is assigned to the assignee of the present application, is designed to receive a printed label from a label printer and to prepare the label for application to a package. Generally, where an automatic labeling machine is provided to remove a label from the mechanism and place the label on a package, the mechanism presents the label to the labeling machine with its printed side facing upwardly. Where the labels are placed on the packages by hand, the labels are presented to an operator with its printed side facing downwardly. If the label includes a heat activatable adhesive on its side opposite the printing, the automatic labeling machine may include a heater for activating the adhesive. For hand operation with a label having such an adhesive, a heater may be provided in the label handling mechanism to activate the adhesive.

While such prior art arrangements are operable, they have a number of disadvantages. For example, the heater of the label handling mechanism is exposed and an operator can easily be burned when picking up a label, if he is not careful. Moreover, a label may remain too long on a heater and become overheated. Further, the prior art arrangements require a relatively complicated device to position a label with its printed side facing either upwardly or downwardly.

It is therefore an object of this invention to overcome the foregoing difficulties by providing a label handling mechanism including an uncomplicated and easily adjustable device for positioning a label with its printed side facing either upwardly or downwardly, and further including a label heater which may be used when the label includes a heat activatable adhesive, and which will not overheat the label. The label handling mechanism is designed to receive a label which has printing on one side thereof and which is moving downwardly in a substantially vertical plane, and the mechanism is mounted below and in the path of the downwardly moving label. The mechanism includes an inclined chute which receives the label at the upper end thereof, and at the upper end of the chute is mounted a label diverter which deflects or turns a falling label 90° before the label falls into and slides down the chute to a removal station. The diverter may be adjusted to turn the label to place its printed side facing either upwardly or downwardly. Where the label includes a heat activatable adhesive, a heater of the mechanism may be used to activate the adhesive.

This invention may be better understood and other objects, features and advantages may be more apparent from the following detailed description taken in conjunction with the accompanying figures of the drawings, in which:

FIG. 1 is a perspective view of a computer scale including a label handling mechanism embodying the invention;

FIG. 2 is an enlarged fragmentary view illustrating the operation of the label handling mechanism with an automatic labeling machine;

FIG. 3 is a further enlarged plan view of the mechanism;

FIG. 4 is a side view of the mechanism shown in FIG. 3;

FIG. 5 is a fragmentary sectional view taken on the line 5—5 of FIG. 3;

FIG. 6 is a fragmentary sectional view taken on the line 6—6 of FIG. 4;

FIG. 7 is a sectional view taken on the line 7—7 of FIG. 3;

FIG. 8 is a sectional view taken on the line 8—8 of FIG. 7;

FIG. 9 is a view illustrating the position of the parts when in one mode of operation of the label handling mechanism;

FIG. 10 is a view generally similar to FIG. 9 but illustrating the position of the parts when in a different mode of operation of the label handling mechanism;

FIG. 11 is a fragmentary view taken on the line 11—11 of FIG. 4; and

FIG. 12 is a schematic diagram of an electrical control circuit of the mechanism.

With reference to the drawings, FIG. 1 illustrates a computer scale apparatus including a weighing unit **15**, a computer unit **16**, and a label printer unit **17**. The computer unit **16** includes circuitry (not shown) for computing total price and weight information, price setting dials **18**, manually operated control push buttons **19**, and a space **21** for status lights and a visual weight display. The unit **16** receives weight information from the weighing unit **15** by a cable **22**, and feeds the computed information to the printer unit **17**. The unit **17** includes provisions for a commodity code selector **23** and a commodity print slug **24**, and further includes a label handling mechanism **26** which receives printed labels from the printing mechanism (not shown) of the unit **17** and presents the labels for application to a package either automatically using a labeling machine or manually.

While the construction and operation of the label handling **26** is described in detail in connection with an automatic transfer and labeling machine of the character disclosed in the Omar Hansen Jr. U.S. Pat. No. 3,384,524, issued May 21, 1968, and in the J. R. Collier et al U.S. Pat. No. 3,410,552, it should be understood that the mechanism is equally useful without an automatic labeling machine or with other types of labeling machines. For example, the mechanism may be used with an automatic labeling machine of the character disclosed in the Fellner et al U.S. Pat. No. 3,372,079, and when used with such a machine, the mechanism **26** would be adjusted to present unheated labels with their printed sides facing downwardly as will be explained.

Further, while the operation of the mechanism **26** is described in detail herein when receiving labels having a heat activatable adhesion thereon, the mechanism could also be used with labels which do not have an adhesive thereon. In such operation, the mechanism would present the labels with their printed sides facing either upwardly or downwardly, and a separate device might be provided to apply an adhesive to the labels after they are removed from the mechanism.

Considering first the operation of the mechansim with a labeling machine as shown in the Hansen Jr. U.S. Pat. No. 3,384,524, and when using labels having a heat activatable coating thereon, when the label handling mechanism **26** is being used in an automatic mode of operation, labels are presented at the lower end of an automatic side, indicated generally by the reference numeral **31** in FIG. **2**, of the mechanism. When the mechanism is being used in a manual mode of opera-

tion, labels are presented at the lower end of a manual side of the mechanism, the manual side being indicated generally by the reference numeral 32. Briefly, the transfer and labeling machine described in detail in the Hansen Jr. U.S. Pat. No. 3,384,524 includes a package transport path over which the package 34 is pushed by a transfer arm 36. The label pickup mechanism includes a label pickup head 37 which is pivotally fastened to the outer end of an arm 38. In operation, the labeling machine swings the arm 38 and the head 37 to one position, shown in full lines in FIG. 2, where the head 37 places the label on the top surface of the package 34, and to a second position shown in dashed lines in FIG. 2, where the head 37 is swung to a position where it faces the lower end of the automatic side 31 of the label handling mechanism 26. The head 37 includes a suction pickup arrangement which picks up a label from the mechanism 26 when the label pickup head 37 is in the dashed line position, and the label is held on the underside of the head 37 until the label is applied to the package 34. The label arrives at the lower end, which may be considered a removal location, of the automatic side 31 of the mechanism 26 with its printed side facing upwardly, and normally a heat activatable adhesive coating covers the underside of the label. The label pickup head 37 includes a heater which heats the label in order to activate the adhesive during the time that the pickup head 37 is holding the label.

The labeling machine further includes means for turning an arm 41 of the label handling mechanism for a purpose to be described hereinafter, as a label is being picked up. In the present instance, such means for turning the arm 41 includes a bolt 42 which is secured to the pivotable arm 38 and moves therewith. The head 43 of the bolt 42 is located to strike the arm 41 and swing the arm 41 rearwardly as will be described hereinafter. Since the label pickup mechanism 33 forms no part of the present invention and since it is described in detail in the previously mentioned Omar Hansen Jr. patent, the mechanism 33 will not be described in further detail.

The label handling mechanism 26 includes a bracket 45 (FIG. 4) and is mounted on the frame of the printed unit 17. The mechanism 26 is positioned in an opening 44 (FIGS. 1 and 2) formed in the lower part of the front panel of the unit 17. With particular reference to FIGS. 3 through 8, the label handling mechanism 26 further includes a downwardly inclined chute 46 having a flat portion 47 and upwardly turned sides 48 and 49 which form guides for preventing a label from sliding off the chute 46. The chute 46 is fastened to the bracket 45 by two mounting blocks 73 and screws 74. The upper end of the chute 46 is located below and in the path of a downwardly moving label 51 (FIG. 4) which leaves a set of label issuing rollers (not shown) of a label printing mechanism included in the unit 17. The label, as it leaves the issuing rollers, is usually bowed slightly as shown in FIGS. 9 and 10 because it is unreeled from a round roll of labels. Further, the label, in the present illustration, is ejected by the issuing rollers at a slight angle, as shown in FIGS. 9 and 10, of approximately 7° from the vertical. Of course, the label handling mechanism 26 will also work as well or better in a printing unit where the label leaving the issuing rollers is perfectly flat and is moving in a vertical plane. As shown in FIG. 1, the mechanism 26 slopes downwardly and forwardly from the front of the unit 17 and is located such that the label, when moving downwardly, is substantially in the plane of a center guide 52 which is substantially midway between the sides 48 and 49 of the chute 46. The center guide 52 is fastened to one of the blocks 73 as by screws 53. The guide 52 and the side 49 between them form the manual side 32 of the mechanism, and the center guide 52 and the side 48 form the automatic side 31 of the label handling mechanism.

To direct the issued label 51 to either the manual side 32 or to the automatic side 31, depending upon the mode of operation of the label handling mechanism, a label diverter 54 is mounted on the upper surface of the chute 46 in the path of the label 51. With particular reference to FIGS. 8, 9 and 10, the diverter 54 includes a concave surface 55 on the manual side thereof and a similar concave surface 56 on its automatic side. The two surfaces 55 and 56 slope downwardly from a peak 60 which is adjacent the center guide 52. The diverter 54 is mounted such that it is manually shiftable laterally of the center guide 52 in order to direct the lable to one side or the other of the chute. For this purpose, a laterally elongated slot 57 (FIG. 8) is formed in the flat portion 47 of the chute 46 below the diverter 54, and a flat generally square spacer 58 is positioned in the slot 57. The spacer is secured to the flat underside of the diverter 54 as by screws 59, the screws 59 also holding a clip 61 (FIG. 4) in place against the bottom surface of the spacer 58. The clip 61 overlies the edges of the slot 57, as shown in FIG. 4, and is bent to form a spring. The clip 61, therefore, by overlying the edges of the slot 57, prevents the diverter 54 from coming loose from the chute 46 and, by exerting a spring force, holds the diverter 54 in a selected position.

As shown in FIG. 8, the slot 57 extends farther in the direction of the automatic side 31 than it does in the direction of the manual side 32. Consequently, as shown in FIGS. 9 and 10, the diverter 54 is movable farther toward the automatic side than toward the manual side. This is important where the labels are bowed slightly and are issued at a slight angle, as shown in FIGS. 9 and 10 and previously discussed. If the labels were flat and moved straight downwardly, the diverter 54 could be arranged to shift equal distances toward both sides of the center quide 52.

When the label handling mechanism is used in conjunction with an automatic labeling machine, the label diverter 54 is manually shifted to the left as shown in FIGS. 2, 3, 4 and 9. A label 51 issued by the printing mechanism of the unit 17 moves downwardly and, as seen in FIG. 9, the lower edge of the label 51 is to the right of the peak 60. Consequently, the label is deflected by the surface 55 toward the right to the automatic side 31 of the label chute 46. The label 51, as seen in FIG. 9, has its printed side facing toward the right and its adhesive side facing toward the left. The lower edge of the label 51 strikes the curved surface 55 of the diverter 54 and the lower edge is tipped to the right as the label slides downwardly on the surface 55, thus placing the label 51 with its printed side facing upwardly. The label 51 after being tipped into the automatic side 31 slides down the side 31 due to the downward slope of the label chute 46 and due to the momentum of the label. To reduce the frictional drag between the label and the chute 46, the upper surface of the chute may be coated with a smooth low-friction material such as Teflon. However, in the present instance,

a wire 65 is fastened to the chute adjacent the guide 52, the wire 65 extending generally parallel to and spaced above the upper surface of the chute 46. As shown in FIG. 9, the wire 65 lifts one side of the label off the chute 46, thus reducing the contact area between the chute and the label. The side 31 of the chute may become hot due to the heater on the manual side 31 of the chute. The wire 65 further serves to hold the adhesive coated bottom side of the label off the chute 46. Holes 64 may be formed in the chute 46 to help dissipate the heat.

Across the lower end of the label chute is a pivotally mounted label trap 66 which receives the labor after it slides off of the chute.

The trap 66 is generally flat and is bent upwardly at its two sides, as indicated at 67 and 68, and across its lower side 69. Again, a pair of forwardly extending wires 71 are preferably fastened to the upper surface of the label trap 66 on the automatic side 31 to hold the label off the surface of the trap. Adjacent its upper edge, the label trap 66 has secured to its underside a pair of label trap mounting blocks 76 (FIGS. 4 and 7) and the blocks 76 are secured to a laterally extending shaft 77 which is pivotally mounted on a U-shaped trap bracket 78 secured to the main mounting bracket 45. Holes are formed in the arms of the U-shaped bracket 78 and the shaft 77 is positioned in the holes. A torsion spring 79 is wound around the shaft 77 and exerts a force between the bracket 45 and the underside of the label trap 66 tending to pivot the label trap 66 in the clockwise direction as seen in FIG. 4.

As shown in FIG. 4, the amount of pivotal movement of the label trap 66 is limited by a downwardly bent upper end 86 of the trap 66 striking the upper surface of the chute bracket 45, and maximum pivotal movement in the counter-clockwise direction as seen in FIGS. 4 and 5 is limited by the lower end 87 of the label trap 66 striking the upper surface of the bracket 45 (FIG. 5). When in its normal upwardly pivoted position, the label trap 66 has less incline from horizontal than the chute 46, as shown in FIGS. 4 and 7, resulting in a tendency of a label sliding onto the trap to slow down. This reduced incline helps to prevent a label from sailing off the lower end of the label trap. As shown in FIGS. 3, 4 and 5, a hole 88 is formed in the label trap 66 on the automatic side 31. A bolt 89 is fastened to the bracket 45 below the hold 88, the bolt being smaller in diameter than the hole 88, and when the label trap 66 is pivoted downwardly to the position shown in FIG. 5, the bolt 89 extends upwardly through the hole 88 in order to lift a label, indicated by the numeral 51 in FIG. 5, upwardly for reasons to be described hereinafter.

During operation in the automatic mode, a label slides down the chute 46 and the label trap 66 until it meets the lower side 69 of the trap where it remains until removed by the label pickup mechanism. The label pickup mechanism 33 automatically pivots the label trap 66 downwardly when picking up a label. This is accomplished by the bolt 42, previously described, striking the arm 41 as shown in FIG. 2, the arm 41 being secured to the end of the shaft 77 which is adjacent the label pickup mechanism 33. The bolt 42 is located to swing the arm 41 downwardly and thereby pivot the label trap 66 from the position shown in FIG. 4 to the position shown in FIG. 5, at the same time as the label pickup head 37 arrives at a position over the label trap 66. Such pivotal movement of the label trap 66 downwardly results in the bolt 89 lifting the label 51 upwardly to a position where it is easily picked up by the suction mechanism of the label pickup head 37, as previously explained. Further, in the even the pickup head 37 for some reason fails to remove the label 51 from the label trap, the label 51 is automatically discarded from the label trap. Such discard is accomplished because the bolt 89 lifts the lower edge of the label sufficiently high that it clears the upper edge of the upturned lower side 69 of the label trap 66 as shown in FIG. 5. Thus, the height of the bolt 89 is adjusted relative to the height of the portion of the lower side 59, which is on the automatic side of the label chute to cause the label to slide over the side 69 when it is not picked up. Assuming that the label pickup head 37 has properly picked up a label from the label trap, movement of the label pickup mechanism and the bolt 42 from the dashed line position toward the solid line position shown in FIG. 2 results in the bolt 42 moving away from the arm 41. The arm 41 and the label trap 66 then swing upwardly to the position shown in FIGS. 4 and 7 due to the action of the torsion spring 79.

As previously mentioned, the label handling mechanism may also be used in a manual mode of operation. The label handling mechanism is adjusted for operation in the manual mode by manually shifting the diverter 54 toward the right from the position shown in FIG. 9 to the position shown in FIG. 10. In the FIG. 10 position, the peak 60 of the diverter 54 is to the right of the center guide 52 and the lower edge of a falling label 51*a*, and the label 51*a* falling downwardly from the label issuing mechanism strikes the side 56 of the diverter 54. The side 56 slopes downwardly from the peak 60 in the direction of the side 49, and a label striking the side 56 is tipped into the manual side of the label chute 46. As previously mentioned, the label leaves the printer and the issuing rollers with its printed side facing toward the right, and therefore the printing is on the bottom side of the label when it slides into the manual side of the chute. The label then slides down the manual side between the side 49 and the guide 52 until it is caught by a pair of fingers 96 which are located at the lower edge of a heater block 97 (FIGS. 3, 7 and 10). The heater block 97 is fastened to the bracket 45 as by screws 98 (FIG. 7) and washer-spacer 99 are preferably provided between the bracket 45 and the underside of the heater block 97 to insulate the bracket 45 from the heater block. The block 97 in the present instance is made of a solid block of metal having a hole 101 (FIG. 8) formed therein which receives a heater cartridge 102. The cartridge 102 is connected by electrical conductors 103 to a connector 146 fastened to the bracket 45 and the cartridge 102 includes an electric heating coil which heats the block 97. The upper surface of the heater block 97 may be flat or it may be shaped to enhance heating of the labels, depending upon the characteristics of the label paper. In the present instance, as is best shown in FIGS. 9 and 10, the sides of the block 97 are machined down so that the upper surface of the block bows downwardly slightly at its sides. This shape may be advantageous in some instances as where a label is received from the printer having a slight curl, causing the label to curve downwardly at the sides of the block 97. By removing the metal at the sides of the block 97, maximum contact area may be obtained between the heater block 97 and

the label 106 for more effective heating of both the sides and the center of the label. Of course, other shapes of the block may be provided when using label paper having other characteristics.

As previously mentioned, the fingers 96 catch a label sliding down the manual side of the label chute and hold the label on top of the block 97 for a predetermined length of time which is calculated to be sufficient to activate the adhesive on the label. The fingers are then retracted to the position shown in FIGS. 4 and 5 permitting the label to slide off the heater block into the trap 66. This assures that the label will remain on top of the heater block 97 for only a certain length of time thereby preventing the label from being excessively heated and possibly scorched. The mechanism for moving the fingers 96 upwardly and downwardly includes a rotary solenoid 107 (FIGS. 7 and 8) fastened to the underside of the bracket 45 by a solenoid mounting bracket 108. The solenoid 107 is connected by a linkage to pivot the fingers 96, the foregoing linkage in the present instance includes an arm 109 which is pivotally connected to the lower ends of the fingers 96, and a block 110 which is secured to the arm 109 and is fastened to a shaft 111 (FIGS. 7 and 8), the shaft 111 being supported by a U-shaped bracket 112 on the underside of the chute bracket 45. A disk and pin 113 connect the rotary solenoid 107 to the shaft 111 (FIG. 8).

The rotary solenoid 107 is a conventional type having a built-in spring which urges the shaft 111 to a position where the fingers 96 are retracted. The position of the fingers 96 when retracted is shown in FIGS. 4 and 7, and it will be apparent that the upper ends of the fingers 96 are below the level of the heater block 97 and the label trap 66, and therefore the fingers 96, when retracted, permit a label to slide downwardly from the heater block 97 to the label trap 66. In operation as will be explained hereinafter, the fingers 96 are moved upwardly by energization of the rotary solenoid 107 for the calculated time. At the end of this time, the rotary solenoid 107 is de-energized and the fingers 96 are retracted, permitting the label to slide downwardly from the heater block 97 into the label trap.

The portion of the label trap 66 downwardly from the heater block 97 again may be provided with a pair of spaced wires 116 (FIG. 3) which hold the label off of the surface of the label trap 66. After the label slides into the label trap 66 below the heater block 97, this area of the trap 66 also being considered a removal location, an operator manually removes the label and applies it to a package. To accomplish this, the operator simply presses a finger on the upper surface of the label, and since the label has its activated adhesive side facing upwardly, the label sticks to the operator's finger making it easy to pick up the label. When removing the label, the operator is supposed to press downwardly hard enough to pivot the trap 66 down in order to actuate a switch, as will be explained. The type of adhesive used on such labels is one that will remain sticky once it has been activated by being heated. In other words, the adhesive will not lose its stickiness after it has cooled off, and therefore the operator can remove the label at his convenience.

While the diverter 54 may have other shapes and still work satisfactorily, it has been found that the shape disclosed herein produces excellent results. The concave surfaces 55 and 56 tip or deflect the labels into the associated sides of the chute 46 without either slowing the labels down too much or causing the labels to sail off beyond the chute. As will be apparent from FIGS. 3, 9 and 10, a downwardly moving label 51 first strikes the diverter on the upper part of the rearward edge of one of the surfaces 55 and 56, just below the portion 142 of the diverter. A label striking the diverter rides down the above rearward edge as the label is tipped toward one of the sides of the chute, and the downward momentum of the label causes it simultaneously to move down the chute and toward one of the sides until it strikes the side. This downward momentum of the label causes it to continue moving down the chute without pause after striking the side of the chute. The foregoing label movement is important because it results in the label moving down the chute as rapidly as possible without sailing off the chute. It should be realized that the labels are ejected by the issuing rollers of the label printer at high speed, and it is an important advantage of the diverter disclosed herein that it is capable of tipping the labels and moving them down the chute without causing them to sail. In the present instance, the radius of the arcs forming the surfaces 55 and 56 is in the neighborhood of two inches, and the total width of the diverter 54 is approximately one half the total width of the chute 46. The diverter 54 is of course symmetrical about the peak 60, and the height of the diverter is approximately three-fourths of its width.

It will be apparent from the foregoing that the label trap 66 is pivoted downwardly on the shaft 77 both during automatic operation and during manual operation. Such pivotal movement of the label trap when a label is being picked up actuates a microswitch 117 (FIG. 5). The microswitch 117 is positioned on the underside of the chute bracket 45 and is fastened to one of the blocks 73 (FIG. 8) on the automatic side of the label chute 46. The switch 117 includes an actuator button 118 and a leaf 119 which is fastened to the switch 117 housing and extends over the top of the button 118 to a position where it underlies the upper edge portion of the label trap 66. When the label trap 66 is in its normal upwardly pivoted position, shown in FIG. 4, the upper edge portion of the label trap 66 presses the leaf 119 downwardly and thereby holds the button 118 in. However, as shown in FIG. 5, when a label is picked up causing the label trap 66 to be pivoted downwardly as previously explained, the upper edge of the label trap 66 moves upwardly out of engagement with the leaf 119, thus releasing the button 118. The switch 117, also shown in FIG. 12, is wired normally closed when there is no pressure on the button 118, and it is therefore momentarily closed when a label is being picked up. The switch 117 may be connected in the computer circuits and supply a signal thereto when the trap 66 swings downwardly.

In some modes of operation, an operator of the machine may desire to have a label presented at the manual removal location with its adhesive side facing upwardly but without the adhesive having been activated by the heater 97. This may be accomplished by holding the fingers 96 in their retracted position, shown in FIG. 4, and while the heater block 97 may be turned off, it is preferably left on and the labels permitted to slide over it. To hold the fingers 96 in their retracted position, a deactivator 126 (FIGS. 4, 6 and 7) is provided. The deactivator 126 is generally Z-shaped in configuration, the center portion of the deactivator 126 being

slidably mounted underneath the bracket **45** and the lower arm of the Z extending upwardly as indicated by the numeral **127.** The other arm **128** of the Z extends downwardly adjacent the fingers **96** and the linkage **109.** When the deactivator **126** is pushed inwardly, the arm **128** extends between the linkage **109** and the bracket **45** and prevents the linkage **109** from swinging upwardly. For normal operation, the deactivator is pulled forwardly away from the linkage **109.**

The electrical circuitry of the label handling device includes a photocell **136** mounted on a printed circuit board **137** which is secured to the frame of the printer unit **17** above the label chute **46.** As shown in FIG. **11,** the printed circuit board **137** has a generally square shaped cutout **138** and the photocell **136** is positioned on one side of the cutout **138.** A lamp **139** is fastened to the board **137** on the opposite side of the cutout **138,** and the photocell **136** is positioned so that it normally receives light from the lamp **139.** Also mounted on the board **137** are other electrical components and conductors indicated generally by the reference numeral **141** which form a conventional circuit for generating a positive going pulse each time the light path from the lamp **139** to the cell **136** is broken by a label. The photocell circuit is connected through the connector part **146** to the circuit shown in FIG. **12** which controls energization of the solenoid **107.** The photocell circuit also may be connected in the computer circuits to signal the computer circuit when the printer does not issue a label after the computer has generated a print command signal.

As shown in FIG. **4,** the printed circuit board **137** is mounted above the label chute **46** and at a location where the label **51,** falling downwardly from the label issuing rolls of the printer mechanism, moves through the cutout **138** of the board **137** as shown in FIG. **11.** Thus, the label **51,** on passing down through the cutout **138,** breaks the light path from the lamp **139** to the photocell **136** and such breakage of the light path is of course detected by the photocell **136.** The photocell **136** thus senses the issuance of each label from the label printing mechanism, and, conversely, senses the absence of a label when one should have been issued. The board **137** is located immediately above the label diverter **54,** and to provide clearance for the board **137,** the upper corner, indicated by the numeral **142,** of the diverter **54,** may be removed as shown in FIG. **4.**

With reference to FIG. **12,** the electrical connector part **146** is illustrated schematically and is electrically connected by wires to a printed circuit board **143,** the rotary solenoid **107** and the microswitch **117,** such wires not being shown in FIGS. **1** to **11** to simplify the drawings. The board **143** (FIG. **4**) is fastened by bolts **144** to the underside of the bracket **45** and is enclosed in a housing **145.** The connector part **146** in the present instance has a conventional construction and includes a plurality of prongs which are adapted to mate with sockets of another connecter part (not shown). The other connector part is mounted within the printer unit **17** at a location where it is coupled to the part **146** when the bracket **45** is fastened to the frame of the printer unit **17.** The prongs of the part **146** are connected across the coil **147** of the cartridge **102** of the heater block **97,** and across the contacts **148** of the switch **117.** Two pairs of prongs may be connected to the contacts **148** so that the switch **117** may be readily connected in different computer circuits designed for manual and automatic operation of the apparatus. The connector part **146** further includes prongs connected to conductors **141, 152** and **153** which are connected to components on the board **143.**

The connector part (not shown) which couples with the part **146** includes sockets for connecting the coil **147** to a power supply and for connecting the contacts **148** to the computer circuits. This part includes additional sockets to connect the conductor **152** to ground, to connect the conductor **151** to the photocell **136** circuit, and to connect the conductor **153** to power supply of, for example, +13 VDC. The conductor **153** leads to a coil **149** of the rotary solenoid **107,** and through the coil **149** to the anode of an SCR **154.** The cathode of the SCR **154** is connected to a ground conductor **156** which leads to the ground conductor **152** of the connector **146.** The SCR **154** further includes a gate **157** which is connected through a resistor **158** to the conductor **151** which leads to the photocell **136** circuit previously described. The gate **157** is also connected through another resistor **159** to the ground conductor **156,** this connection to the gate **157** being provided to suppress transients.

The anode of the SCR **154** is further connected to the ground conductor **156** through a normally off transistor **161** which has its emitter and collector connected across the SCR **154.** The base of the transistor **161** is connected to one base **168** of the unijunction transistor **162** which is also normally off, this connection normally holding the transistor **161** biased off.

The circuit shown in FIG. **12** further includes another transistor **163** which has its base connected to a voltage divider arrangement consisting of the coil **49** and two resistors **164** and **165,** the components **149, 164** and **165** being connected in series between the conductors **152** and **153.** The base of the transistor **163** is connected to the juncture of the two resistors **164** and **165,** and the potential on the base of the transistor **163** is sufficient to normally hold the transistor **163** biased on. The emitter of the transistor **163** is connected to the ground conductor **156** and the collector of the transistor **163** is connected to the positive conductor **153** through a resistor **167,** with the result that current normally flows through the resistor **167** and the transistor **163.**

The base **168** of the transistor **162** is also connected through a resistor **169** to the ground conductor **156.** The second base **170** of the transistor **162** is connected to the collector of the transistor **163** through another resistor **171.** The emitter **173** of the transistor **162** is connected to the juncture of a timing capacitor **174** and a variable resistor **176,** the capacitor **174** and the resistor **176** being connected in series between the ground conductor **156** and the collector of the transistor **163.**

Considering the operation of the circuit shown in FIG. **12,** the potential on the conductor **151** is normally low and the SCR **154** is turned off. Current flows from the conductor **153** through the coil **149** and the resistors **164** and **165,** and while this current is enough to produce a voltage drop across the resistor **165** sufficient to bias the transistor **163** on, the current through the coil **149** is not sufficient to energize the rotary solenoid **107.** With the transistor **163** biased on, the juncture of the resistors **167** and **171** is near ground potential because the transistor **163** is essentially a short cir-

cuit, and therefore no charge accumulates on the capacitor 174. With no charge on the capacitor 174, the unijunction transistor 162 is also biased off.

When a label is issued by the label printer of the printing unit 17, it falls through the cutout 138 and breaks the light path between the photocell 136 and the lamp 139, thus producing a positive going pulse which appears on the conductor 151. This positive going pulse triggers the SCR 154 on and thus connects the coil 49 directly across the positive conductor 153 and the ground conductor 152. The solenoid 107 is therefore energized and the fingers 96 are extended upwardly to the position shown in FIG. 10, where they hold the label which has just dropped downwardly and broken the light path to the photocell 136.

As soon as the SCR 154 is triggered on, it shorts the two resistors 164 and 165 and biases off the transistor 163. With the transistor 163 off, current flows from the positive conductor 153 through the resistor 167, the resistor 176 and the capacitor 174 at a rate which is determined by the values of the two resistors 167 and 176, and when the capacitor charge has built up to a certain value, it triggers the unijunction transistor 162 on. Since the resistor 176 is variable, the time duration from the time that the SCR 154 is turned on until the transistor 162 is turned on may be readily adjusted. The time duration is normally about one second, and is preferably adjustable between the values of .25 second and 3 seconds. The length of time required for the capacitor 174 to charge is precalculated in accordance with the length of time required for a label to move past the photocell 136 and for the label to become heated while on the heater block 97.

As soon as the unijunction transistor 162 is turned on due to the discharge of the capacitor 174 through it, the potential on the base 168 rises and biases the transistor 161 on. Since the transistor 161 is connected directly across the SCR 154, the transistor 161 then shorts out the SCR 154 resulting in it being turned off and the coil 149 being de-energized. The spring built into the rotary solenoid 107 then retracts the fingers 96 and permits the label to slide downwardly from the heating block 97 into the label trap 66. After the capacitor 174 has discharged through the unijunction transistor 162, the unijunction transistor 162 stops conducting and then the transistor 161 is again biased off. The transistor 163 is then again biased on because with the transistor 161 and the SCR 154 both off, the short to ground is removed from across the two resistors 164 and 165. The circuit shown in FIG. 12 has then returned to its initial condition where it remains until the next label falls through the cutout 138.

As previously mentioned, the label handling mechanism 26 is useful in applications other than with an automatic labeling machine of the character disclosed in the previously mentioned Hansen Jr. patent. For example, the mechanism 26 may be used with a labeling machine of the character disclosed in the previously mentioned Fellner et al U.S. Pat. No. 3,372,079. When used with such a labeling machine, the diverter 54 is adjusted to the position shown in FIG. 10 where the labels are always turned to place their printed side down. For automatic operation with the Fellner et al machine, the deactivator 126 is pushed in, thereby holding the fingers 96 retracted. The labels then slide across the heater block 97 without being heated even though the heater may be on and into the trap 66 where they are picked up with their printed sides facing downwardly. In manual operation, the deactivator 126 is pulled out and therefore the fingers 96 momentarily hold the labels on the heater block to activate the adhesive, as previously explained.

Also as previously mentioned, the mechanism 26 may be used with labels which do not have a heat activatable adhesive, and with labels which do not have an adhesive coating of any kind. In such use, the deactivator 126 is pushed in to hold the fingers 96 retracted, and the diverter 54 is adjusted to turn the labels to place the printed side facing either upwardly or downwardly, as desired.

It will be apparent from the foregoing detailed description that a novel and useful label handling mechanism has been provided. The mechanism may be used in conjunction with different kinds of labeling machines, and it is readily adjustable for use either in a manual mode of operation or in an automatic mode of operation. When in the manual mode of operation, the heater used with such operation is not at the removal location where the operator picks up the label, and therefore the operator cannot burn his finger when picking up a label. Further, the label is held on the heater block only for a length of time sufficient to activate the adhesive. When the label handling mechanism is being used in the automatic mode of operation with the Hansen Jr. labeling machine, the mechanism includes means for discarding a label in the event it is not picked up by the automatic labeling machine. The screw 89 has the further advantage of lifting the label up so that it is easily picked up by the suction mechanism of the label pickup head of the Hansen Jr. machine.

We claim:

1. A label handling mechanism adapted to receive a label moving downwardly in a generally vertical first plane of movement, said mechanism comprising an inclined chute adapted to be positioned below said label and intersecting said first plane, a label diverter mounted above said chute and in the path of said downwardly moving label, said diverter including first and second portions each of which when positioned to intersect said plane is adapted to deflect said label laterally of said first plane in a second plane of movement, said first and second portions deflecting said label in opposite directions into different sides of said chute, said chute being inclined downwardly from said diverter and guiding said label in a third plane of movement, means supporting said diverter for lateral adjustment on said chute, said diverter when adjusted in one direction having one of said portions located in said plane and when adjusted in the opposite direction having the other of said portions located in said plane, said supporting means comprising spring means for holding said diverter in either of its adjusted positions.

2. A label handling mechanism adapted to receive a label moving downwardly in a generally vertical plane, said mechanism comprising an inclined chute adapted to be positioned below said label and intersecting said plane, a label diverter mounted above said chute and in the path of said downwardly moving label, said diverter including first and second portions each of which when positioned to intersect said plane is adapted to deflect said label laterally of said plane, said first and second portions deflecting said label in opposite directions into different sides of said chute, said chute being

divided into first and second laterally adjacent inclined sides which are on opposite sides of said plane, said diverter deflecting a label into one or the other of said sides, a heater mounted in one of said sides downwardly of said diverter, and means for holding a label on said heater for a predetermined length of time, said holding means comprising a label stop which is extendable to one position where it is in the path of a label and prevents a label from sliding off said heater and which is retractable to a second position where it is out of the path of a label, and means connected to said label stop for extending said stop in response to a label falling into said mechanism and for retracting said stop a predetermined time thereafter, said last named means including a photocell circuit adapted to respond to a label falling into said chute, and solenoid means connected to respond to said photocell circuit and to extend said stop in response thereto.

3. A mechanism as in claim **2,** wherein said last named means further includes a timing circuit connected to said photocell means and to said solenoid means, said solenoid means being energized in response to said photocell circuit to extend said stop and being de-energized a predetermined time thereafter by said timing circuit to retract said stop.

4. A label handling mechanism adapted to receive a label moving downwardly in a generally vertical first plane of movement, said mechanism comprising an inclined chute adapted to be positioned below said label and intersecting said first plane, a label diverter mounted above said chute and in the path of said downwardly moving label, said diverter including first and second portions each of which when positioned to intersect said plane is adapted to deflect said label laterally of said first plane in a second plane of movement, said first and second portions deflecting said label in opposite directions into different sides of said chute, said chute being inclined downwardly from said diverter and guiding said label in a third plane of movement, said chute being divided into first and second laterally adjacent inclined sides which are on opposite sides of said plane, said diverter deflecting a label into one or the other of said sides, a heater mounted in one of said sides downwardly of said diverter, means for holding a label on said heater for a predetermined length of time, said holding means comprising a label stop which is extendable to one position where it is in the path of a label and prevents a label from sliding off said heater and which is retractable to a second position where it is out of the path of a label, means connected to said label stop for extending said stop in response to a label falling into said mechanism and for retracting said stop a predetermined time thereafter, and manually adjustable means for holding said label stop in said second position.

5. A label handling mechanism adapted to receive a label moving downwardly in a generally vertical first plane of movement, said mechanism comprising an inclined chute adapted to be positioned below said label and intersecting said first plane, a label diverter mounted above said chute and in the path of said downwardly moving label, said diverter including first and second portions each of which when positioned to intersect said plane is adapted to deflect said label laterally of said first plane in a second plane of movement, said first and second portions deflecting said label in opposite directions into different sides of said chute, said chute being inclined downwardly from said diverter and guiding said label in a third plane of movement, and a label trap mounted at the downward end of said chute and extending across said downward end, said trap receiving a label which slides off said downward end of said chute and forming a removal location for labels at each side of said trap, at least one side of said chute and said trap has wire means extending across the upper surface thereof to hold at least a portion of the label off said surface.

6. A label handling mechanism adapted to receive a label moving downwardly in a generally vertical first plane of movement, said mechanism comprising an inclined chute adapted to be positioned below said label and intersecting said first plane, a label diverter mounted above said chute and in the path of said downwardly moving label, said diverter including first and second portions each of which when positioned to intersect said plane is adapted to deflect said label laterally of said first plane in a second plane of movement, said first and second portions deflecting said label in opposite directions into different sides of said chute, said chute being inclined downwardly from said diverter and guiding said label in a third plane of movement, and a label trap mounted at the downward end of said chute and extending across said downward end, said trap receiving a label which slides off said downward end of said chute and forming a removal location for labels at each side of said trap, said trap being pivotally mounted on a laterally extending axis which is adjacent the upper side of said trap.

7. A mechanism as in claim **6** and further including a switch for controlling operation of a machine on which said label chute is mounted, said switch being mounted adjacent said trap and adapted to be actuated in response to said trap being pivoted.

8. A label handling mechanism adapted to receive a label moving downwardly in a generally vertical plane, said mechanism comprising an inclined chute adapted to be positioned below said label and intersecting said plane, a label diverter mounted above said chute and in the path of said downwardly moving label, said diverter including first and second portions each of which when positioned to intersect said plane is adapted to deflect said label laterally of said plane, said first and second portions deflecting said label in opposite directions into different sides of said chute, a label trap mounted at the downward end of said chute and extending across said downward end, said trap receiving a label which slides off said downward end of said chute and forming a removal location for labels at each side of said trap, said mechanism being usable in either a first mode of operation or in a second mode of operation, and said trap forming a first removal location for use in said first mode and a second removal location for use in said second mode, a hole being formed in said trap in said first removal location, and further including means adapted to extend upwardly through said hole and lift a label upwardly as a label is being removed from said first removal location.

9. A mechanism as in claim **8,** wherein said trap is pivotally mounted for downward movement as a label is being removed therefrom, said last named means being mounted below said trap and said last named means extending through said hole when said trap is pivoted downwardly.

10. A mechanism as in claim 8, wherein said trap includes an upwardly turned bottom side which normally prevents a label from sliding off said trap, said means adapted to extend upwardly through said hole and lift said label above the level of said side to enable a label to slide off said chute in the event the label is not properly removed.

11. A label handling mechanism for use with a label printer, said printer issuing a label downwardly in a substantially vertical plane, said mechanism comprising a label chute adapted to be positioned under the point of issuance of the label, said chute being inclined downwardly, a label diverter positioned at the upper side of said chute in the path of said downwardly issued label, said diverter having a slanted surface on a lateral side thereof, said lateral surface intersecting said plane of said label, whereby said label strikes said slanted surface and is deflected to one side of said chute and then slides downwardly in said chute, said diverter being located adjacent the upper end of said one side of said chute, the lower end of said one side of said chute forming a removal station for said label, a heater mounted in said chute between said upper and lower ends, and retractable means for momentarily holding a label on said heater, and deactivator means connectable to said retractable means for preventing operation of said retractable means.

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