Nov. 24, 1964 O. V. HOLLIS 3,158,315

TAPE PERFORATOR ELECTRIC SHIFT AND UNSHIFT

Filed May 2, 1960 2 Sheets-Sheet 1

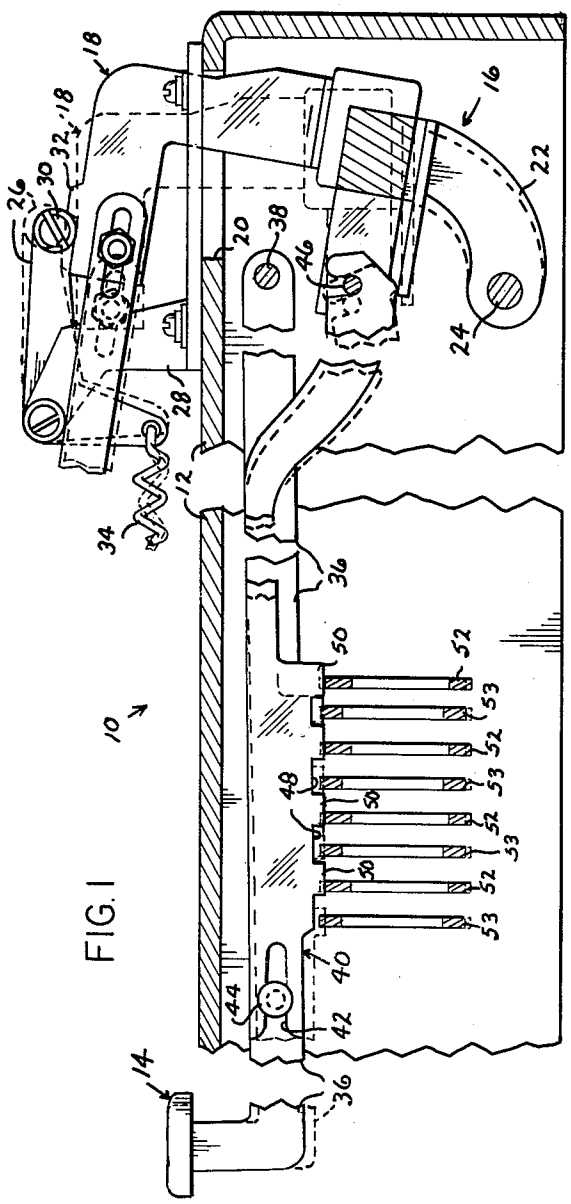


FIG. 1

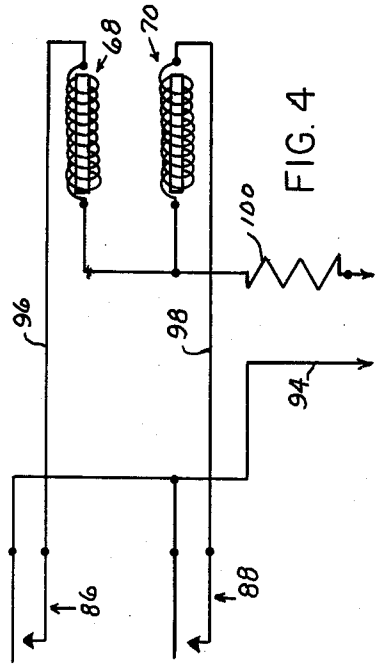


FIG. 4

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TAPE PERFORATOR ELECTRIC SHIFT AND UNSHIFT

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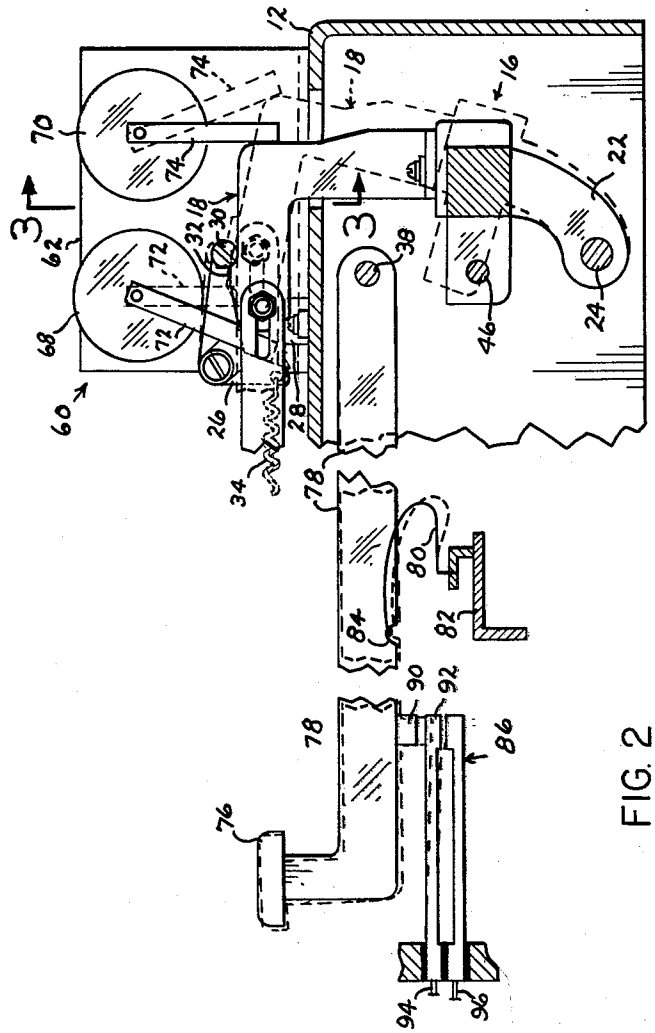


FIG. 2

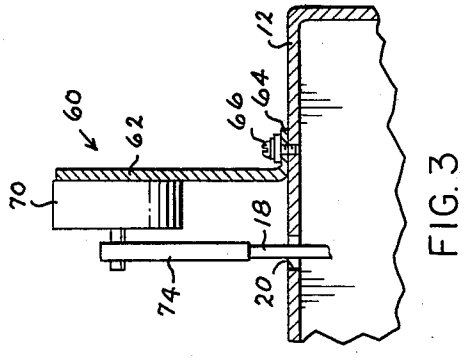


FIG. 3

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3,158,315
Patented Nov. 24, 1964

3,158,315

TAPE PERFORATOR ELECTRIC SHIFT AND UNSHIFT

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Filed May 2, 1960, Ser. No. 26,187
5 Claims. (Cl. 234—96)

The present invention relates to tape perforators and more particularly to a kit-modification or means for converting the manually tripped shift and unshift keys to an electro-magnetic trip action.

Tape perforating machines are used at the present for punching a type code in a control form or paper to be fed through an operating unit which automatically actuates a typesetting machine for casting type slugs. A number of electrical tripping means have been provided for converting the character selecting keys of tape perforating machines to electric operation, however, none of these devices, as far as I know, provide a means for actuating the machine between shift and unshift position. Most of the conventional shift and unshift mechanisms of tape perforating machines include a shift bail which pivots about a horizontal axis and is connected with each of the character coding keys to move the latter horizontally thereby altering their position with respect to counting selector bars so that the character key selected actuates the coding bars and forms upper or lower case characters in response to the shift or unshift position of the shift bail. This pivoting movement of the shift bail is a separate and distinct operation quite different from the movement of the character keys. Furthermore, this bail shifting operation, although lever operated, requires that more pressure be manually applied to the shift or unshift key than is necessary for the operation of the character selecting keys and results in unduly tiring the punch machine operator. Since pivoting the shift bail is an operation separated from the code punching function, the code punching machines converted to electric operation of the character selecting keys do not provide an electrically controlled means for actuating the shift and unshift keys.

It is, therefore, the principal object of the instant invention to provide electric controlled means for pivoting the shift bail of tape perforating machines between shift and unshift positions.

Another object is to provide an electrically operated means and an electrical circuit which may be connected with the source of electrical energy provided for an electrical character selecting key circuit.

Another important object is to provide an electrical means for pivoting the shift bail which is actuated by downward movement of the shift or unshift key by the closing of an electrical switch.

A further object is to provide switch means for the shift key levers so that the effort required to depress these keys will be materially reduced thereby providing a bank of keys which all operate with a "light touch."

The present invention accomplishes these and other objects by mounting a pair of rotary solenoids adjacent the upwardly disposed end of the shift bail extension and mounting a normally open electric switch below each shift and unshift key. Wiring, connected with the normally open switches and the rotary solenoids, is connected to a suitable source of electrical energy for actuating the respective solenoid in response to closing the respective switch by the depression of the shift or unshift key.

Other objects will be apparent from the following description when taken in conjunction with the accompanying two sheets of drawings, wherein:

FIGURE 1 is a fragmentary cross-sectional view, partly in elevation, through a portion of a conventional tape perforating machine;

FIGURE 2 is a view similar to FIG. 1 illustrating the device installed thereon;

FIGURE 3 is a fragmentary vertical sectional view, partly in elevation, taken substantially along the line 3—3 of FIG. 2; and,

FIGURE 4 is a wiring diagram of the electrical circuit.

Like characters of reference designate like parts in those figures of the drawings in which they occur.

In the drawings:

The reference numeral 10 indicates, as a whole, a tape perforating machine having a housing or frame 12, a bank of character selecting keys 14, only one of which is shown in FIG. 1, a shift bail 16 and shift bail extension 18 projecting upwardly above the frame 12 through an opening 20. The shift bail includes a depending arcuate arm 22 which is pivotally mounted, adjacent its depending end, on the frame by a pin 24 so that the shift bail and its extension may be pivoted from its shift position, as shown by solid lines in FIG. 1 to the unshift position illustrated by the dotted lines. A shift bail detent 26, mounted on a bracket 28, connected to the upper surface of the frame adjacent the shift bail extension, is provided with a roller 30 which contacts an ear 32 on the shift bail extension to maintain the shift bail in a shift or unshift position. A shift bail detent spring 34, connected to the end of the shift bail detent opposite the roller 30, maintains the roller in contact with the shift bail extension. The character selector keys 14 each includes a shank portion 36 which extends inwardly of the frame and is pivotally mounted by a pin 38 connected to the frame 12. An elevator bar 40 is flatly positioned adjacent one side of the key lever 36 and has one end portion slotted, as at 42, which slidably receives a pin 44. The other end of the elevator bar is removably connected to a pin 46 connected to the shift bail 16. A portion of the depending edge of the elevator bar is provided with a series of recesses 48 defining a plurality of downwardly directed extents 50 which selectively contact the desired counting selector bar 52 or 53. The selector bars 52 and 53 are horizontally mounted transversely of the frame and determine whether upper or lower case characters are formed in the code punching operation. For example as illustrated in FIG. 1, the elevator bar has depressed the bars 52 which select the upper case characters of the particular character key depressed. When the shift bail has been moved to the dotted line position in FIG. 1, the elevator bar is moved longitudinally with respect to the key shank 36 thus positioning the elevator bar extents 50 over the counting selector bars 53 to form lower case characters of the particular key depressed. Movement of the shift bail 16 is manually accomplished in this operation by the shift and unshift levers connected by links, not shown, to the shift bail. The above operative description is conventional with code selecting punching machines and is set forth here to illustrate the manner of operation of the machine with which the instant invention is designed to operate.

In carrying out the invention, solenoid means, indicated generally at 60, comprising a bracket member 62 projecting vertically above the frame 12, is connected thereto adjacent one side of the shift bail extension 18 by a base portion 64 and screws 66. A pair of rotary solenoids 68 and 70 are mounted in horizontal spaced relation on the side of the bracket 62 adjacent the shift bail extension. A pair of arms 72 and 74 are each connected at one end in depending relation to the shaft of the solenoids 68 and 70, respectively. The depending end portion of the arm 72 contacts the forward vertical end edge surface of the shift bail extension while the

depending end portion of the arm 74 contacts the rearward vertical edge surface of the shift bail extension for the purposes which will presently be apparent.

The shift and unshift key levers are identical and only one is shown in FIG. 2 and is indicated generally by the numeral 76. The unshift key 76 includes an elongated shank portion 78 which is similarly pivotally mounted by its inwardly extending end portion on the pin 38. The conventional lever, not shown, extending between the shift and unshift levers and the shift bail, for pivoting the latter, is removed when installing the invention. The shift key 76 is maintained in the solid line position shown in FIG. 2 by a conventional key lever spring 80 connected at one end to a transverse bracket 82 secured to the frame. The spring 80 is connected at its opposing end to a recess 84 formed in the depending edge surface of the key lever shank 78. Normally open switches 86 and 88 are mounted on and insulated from the frame 12 below the shift and unshift keys. As shown in FIG. 2, the switch 86 is mounted below the shift key 76. A projection 90 is secured in depending relation to the depending edge of the shift key shank 78 for contacting the switch arm 92 and closing the switch 86 when the key 76 is manually depressed.

One terminal of each switch 86 and 88 is connected in series by a wire 94 to one terminal of a suitable source of electrical energy, not shown (FIG. 4). The other terminal of each switch 86 and 88 is connected in series, by wires 96 and 98, through the solenoids 68 and 70, respectively, to the other terminal of the source of power through a suitable resistor 100.

Operation

In operation, when the unshift lever 76 is depressed closing the switch 86, as shown by dotted lines (FIG. 2), the solenoid 70 is energized. Energizing the solenoid 70 rotates its arm 74 from the dotted line position to the solid line position thus moving the shift bail 16 and shift bail extension 18 forwardly or to the left, as shown in FIG. 2, which is the unshift or lower case character selecting position for the elevator bar 40.

Downward movement of the shift key lever, not shown, closes the switch 88 thus energizing the solenoid 68. Energizing the solenoid 68 pivots its arm 72 from the solid line position, shown in FIG. 2, to the dotted line position and similarly moves the shift bail and shift bail extension to the dotted line position wherein the elevator key lever 40 contacts the selector bars 52 and selects upper case coding. Thus it may be seen that the shift bail may be pivoted about the mounting pin 24 between the shift and unshift positions by simply depressing the respective shift or unshift key to close the switch 86 or 88.

Obviously the invention is susceptible to some change or alteration without defeating its practicability, and I therefore do not wish to be confined to the preferred embodiment shown in the drawings and described herein, further than I am limited by the scope of the appended claims.

I claim:

1. In a control form perforating apparatus of the class described having a frame, a set of character selecting keys, shift and unshift keys, key levers and counting selector bars, a shift bail connected to one end portion of the counting selector bars and a shift bail extension, an improvement which comprises: an upstanding bracket mounted on said frame adjacent said shift bail extension; a pair of rotary solenoids mounted in horizontal spaced-apart relation on said bracket; an elongated bar connected in depending relation to the shaft of each said solenoid, the depending end portion of each said bar contacting opposing edge surfaces of said shift bail extension; an electric switch mounted on said frame below said shift and said unshift keys, respectively; and wiring

connecting said switches and said solenoids with a source of electrical energy.

2. In a control form perforating apparatus of the class described having a frame, a horizontal pivoting shift bail and a pair of keys for actuating said shift bail and having a shift bail extension extending upwardly above the frame, the improvement which comprises: a pair of rotary solenoids mounted adjacent said shift bail extension, said solenoids each having a movable depending arm in contact with opposing end surfaces of said shift bail extension; a pair of switches mounted on said frame and adapted to be closed by said pair of keys; and electrical wiring connecting a source of power to said solenoids through said switches.

3. In a control form perforating apparatus of the class described having a frame, character selecting keys, a shift key and an unshift key, a shift bail pivotally mounted by said frame, key bars connected with said character selecting keys and said shift bail and movable longitudinally in response to pivoting movement of said shift bail and a shift bail extension projecting above said frame, the improvement which comprises: an upstanding bracket mounted on said frame adjacent said shift bail extension; a pair of solenoids mounted on a common side of said bracket in horizontal spaced-apart relation; bar means connected with each said solenoid and contacting opposing edge surfaces of said bail extension for moving the latter and pivoting said shift bail in response to the energization of said solenoids; normally open switch means mounted on said frame adjacent said shift key and said unshift key; and wiring connecting said switch means and said solenoids with a source of electrical energy.

4. In a control form perforating apparatus of the class described having a frame, a bank of character selecting keys including a shift and an unshift key, key levers connected with said keys and extending horizontally into and mounted on said frame, a shift bail mounted by said frame adjacent the inwardly disposed ends of said key levers for pivoting movement about a horizontal axis, counting code bars pivotally connected at one end to said shift bail and slidably connected at their other end with the respective key levers, counting selector bars horizontally mounted transversely by said frame for vertical movement when contacted by said counting code bars, a shift bail extension rigidly connected with said shift bail and projecting upwardly above said frame for movement in a vertical plane toward and away from said bank of keys and pivoting the shift bail about its axis, the improvement which comprises: an upstanding bracket rigidly connected to said frame adjacent said shift bail extension; a pair of rotary solenoids having rotating shafts mounted in horizontal spaced-apart relation on said bracket with the rotating shafts of said solenoids projecting into the vertical plane of movement of said shift bail extension; an elongated bar member connected at one end with the shaft of each respective said solenoid, the other end portion of each said bar member frictionally contacting the respective vertical end edge surface of said shift bail extension for moving said shift bail extension and shift bail toward and away from said bank of keys from a shift to an unshift position in response to energization of the respective solenoid; a normally open switch mounted on said frame below each said shift and unshift key; and electrical wiring respectively connecting each said normally open switch and each of said solenoids in series with a source of electrical energy for respectively energizing said solenoids in response to the depression of said shift and unshift keys.

5. In a control form perforating apparatus of the class described having a frame, a bank of vertically movable character selecting keys including a shift and an unshift key, key levers connected with said keys and extending horizontally into and mounted on said frame, a shift bail pivotally mounted horizontally by said frame

adjacent the inwardly disposed ends of said key levers, counting code bars pivotally connected at one end to said shift bail and slidably connected at their other end with the respective said key levers, counting selector bars horizontally mounted transversely by said frame for vertical movement and forming lower or upper case characters when contacted by said couting code bars in response to downward movement of said character selecting keys, a shift bail extension rigidly connected with said shift bail and projecting upwardly above said frame for movement toward and away from said bank of keys and pivoting said shift bail about its horizontal axis, the improvement which comprises: an upstanding bracket rigidly connected to said frame adjacent and in closely spaced parallel relation with respect to said shift bail extension; a pair of rotary solenoids having oppositely rotating shafts mounted in horizontal spaced-apart relation on a common side of said bracket, the spacing between the rotating shafts of said solenoids being substantially equal with respect to the distance between opposing vertically disposed end surfaces of said shift bail extension; an elongated bar member connected at one end with the shaft of each respective said solenoid, the

other end portion of each said bar member frictionally contacting the respective vertical end edge surface of said shift bail extension for moving said shift bail extension and shift bail toward and away from a shift to an unshift position in response to energization of the respective solenoid; a pair of normally open switches mounted on said frame and adapted to be respectively closed by each said shift and said unshift key; and electrical wiring respectively connecting said normally open switches and said solenoids in series with a source of electrical energy for energizing said solenoids in response to the closing of the respective switch.

References Cited by the Examiner

UNITED STATES PATENTS

1,976,352	10/34	Maul	234—96
2,059,250	11/36	Krum	234—11
2,737,240	3/56	Brewer	234—103

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