March 12, 1968 M. SIEGEL ET AL 3,372,788

PRINTER FUNCTIONAL OPERATION CONTROL MEANS

Filed July 22, 1966 2 Sheets-Sheet 1

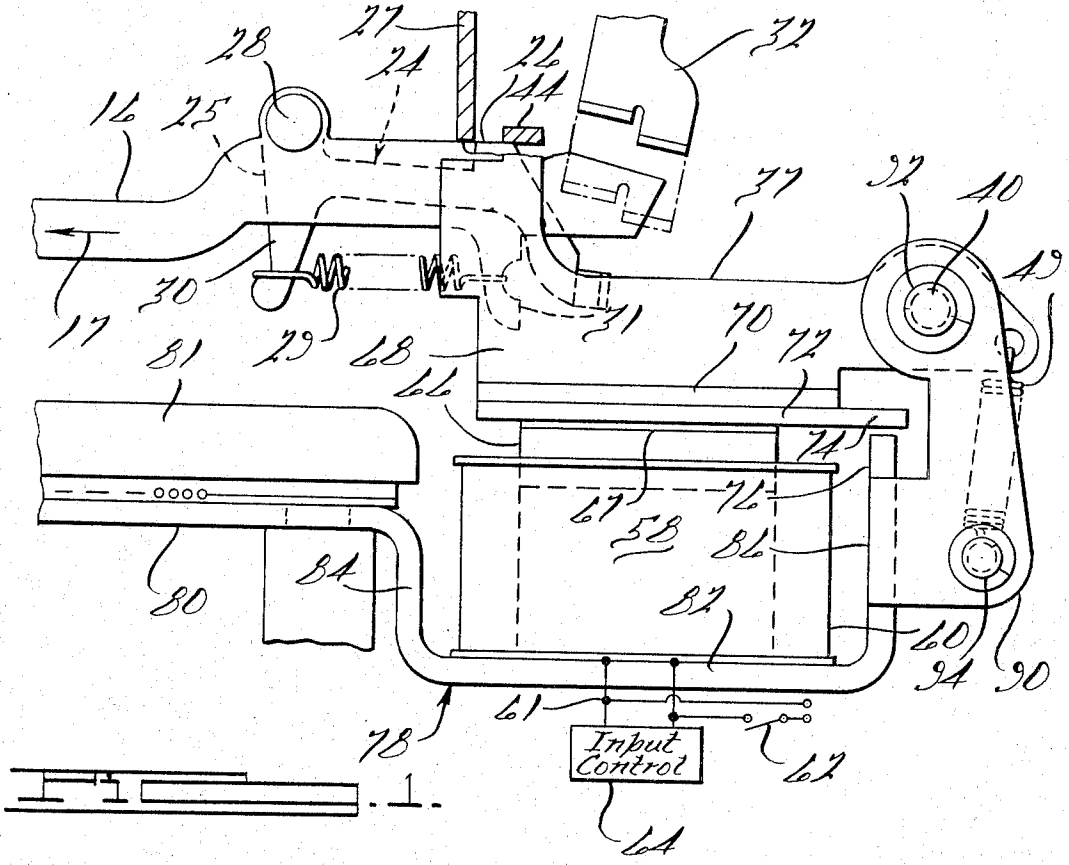


FIG. 1.

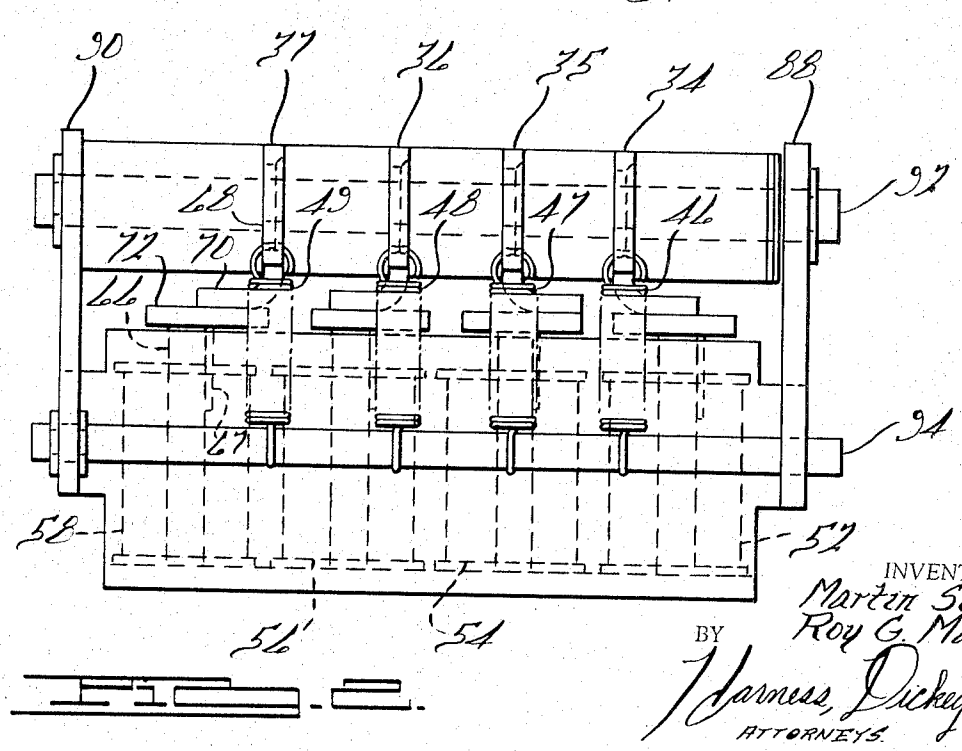


FIG. 2.

INVENTORS
Martin Siegel,
Roy G. Mason
BY
Harness, Dickey & Pierce
ATTORNEYS

March 12, 1968 M. SIEGEL ET AL 3,372,788

PRINTER FUNCTIONAL OPERATION CONTROL MEANS

Filed July 22, 1966 2 Sheets-Sheet 2

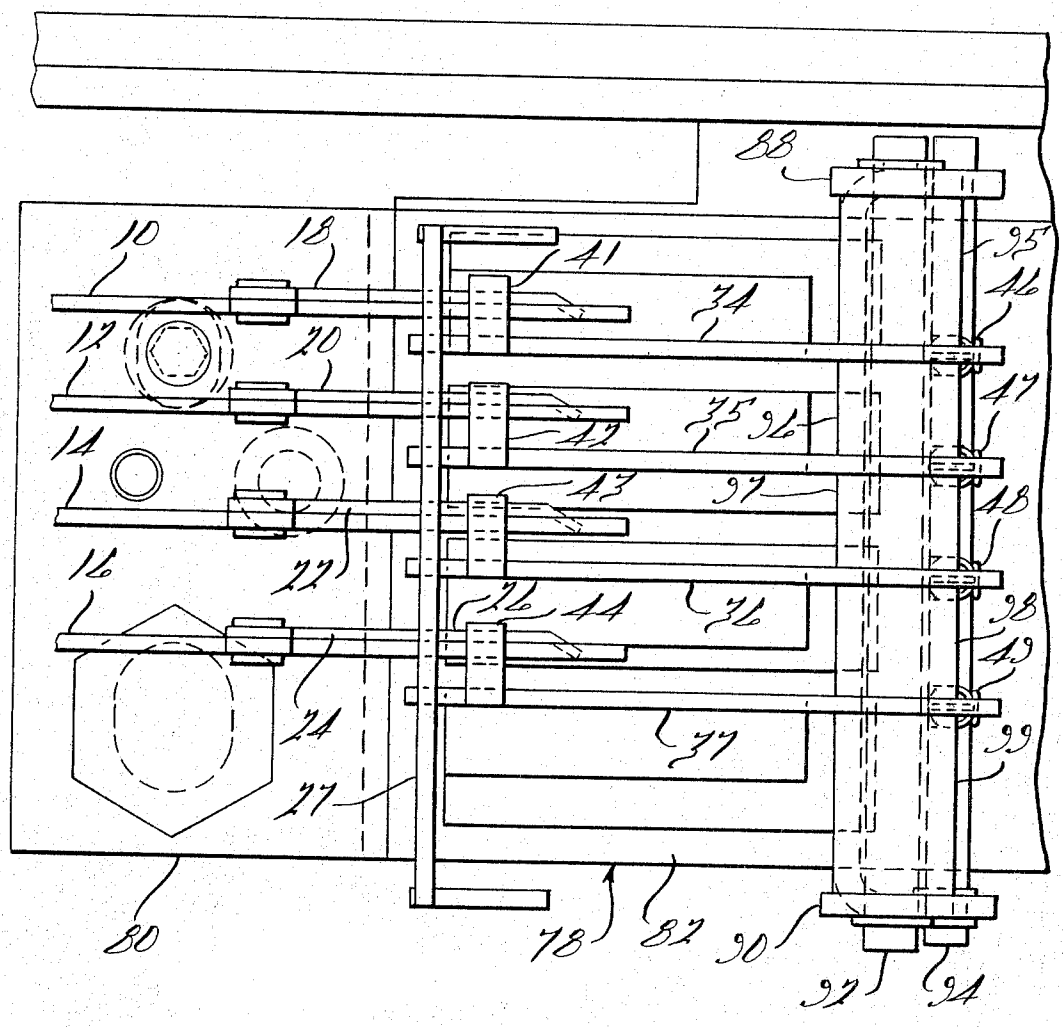


FIG. 3.

INVENTORS.
Martin Siegel,
Roy G. Mason

BY Harness, Dickey & Pierce
ATTORNEYS.

United States Patent Office 3,372,788
Patented Mar. 12, 1968

3,372,788

PRINTER FUNCTIONAL OPERATION CONTROL MEANS

Martin Siegel, Oak Park, and Roy G. Mason, Detroit, Mich., assignors to Dura Corporation, Oak Park, Mich., a corporation of Michigan

Filed July 22, 1966, Ser. No. 567,259
5 Claims. (Cl. 197—19)

ABSTRACT OF THE DISCLOSURE

There is herein disclosed an operational control system for a printer having manually operable selection means for selecting various operations and comprising electrically operable control means for selecting the various operations, switch means operable by the manually operable selection means to actuate the electrically operable control means, and input signal means operable by an associated input device to selectively actuate the electrically operable control means.

This invention relates to business machines and more particularly to a printer such as an electric typewriter.

The invention resides in the provision of new and improved control means for selecting and causing functional operations in a typewriter such as spacing, backspacing, carrier return, and index operations.

The inventive principles have been applied to an electric typewriter or printer of the type designated Selectric and manufactured by International Business Machines. Portions of the operating mechanism of such a typewriter are shown, for example in U.S. 3,239,049. In the presently preferred embodiment of the invention, the printer is incorporated in an automatic writing system of the type disclosed in copending applications Ser. No. 519,872 filed Jan. 11, 1966, for Writing System and Ser. No. 559,038 filed June 7, 1966, for Writing System. In such a system, the printer is manually operable by depression of selection keys on a keyboard and is automatically operable by electrical input signals from an associated reader system or the like.

The principal object of this invention is to provide electrically operable control apparatus for controlling functional operations in the printer in a faster and more reliable manner than heretofore.

An illustrative embodiment of the invention is shown in the drawings in which:

FIGURE 1 is a side elevational view of the apparatus;

FIG. 2 is an end view of the apparatus shown in FIG. 1; and

FIG. 3 is a plan view of the apparatus shown in FIG. 1.

Referring now to FIG. 3 of the drawings, the printer is provided with functional operation selection means in the form of a plurality of slide elements **10, 12, 14, 16** mounted in parallel side by side relationship and slidably supported for reciprocable movement along their longitudinal axes between retracted inoperative positions, as shown, and extended operating positions (not shown) displaced longitudinally in the direction of the arrow **17** in FIG. 1. In the illustrative embodiment, the slide elements are provided for index, carrier return, backspace, and spacing operations, respectively. Spring means (not shown) bias the slide elements toward the operative position. The selection means further comprises latch means **18, 20, 22, 24**, FIG. 3, associated with each of the slide elements and selectively pivotally movable between a latched position (not shown) and an unlatched position shown in FIG. 1. In the latched position, the slide elements are held in the inoperative position against the bias of the spring means. In the unlatched position,

the slide elements are moved in the diretcion of the arrow **17** to the operative position by the spring means.

In the illustrative embodiment, as shown in FIG. 1, each of the latch means comprises a lever member **25** having an shoulder portion **26** adapted to be retainingly engaged by a latch bar **27** in the latched position. The lever member **25** is pivotally mounted about a pivotal connection **28** for pivotal movement which causes shoulder portion **26** to be moved out of and into latching engagement with the latch bar **27**. A latch spring **29** is mounted at one end on a leg portion **30** of the lever and at the other end on a leg portion **31** of the slide element so as to bias the lever toward the latched position. In prior practice, the latch lever has been pivotally actuable to the release position, shown in FIG. 1, by a leg portion **32** of manually operable selection levers of the printer. This apparatus is of conventional design and is not therefore described in any greater detail herein, reference being made to the well known Selectric typewriter construction involved.

In the present invention, it is proposed to actuate the slide members electrically and automatically without actuation of selection lever **32**. To this end, latch release means are provided which comprise armature members **34, 35, 36, 37** pivotally mounted at one end at **40** and having latch engaging means **41, 42, 43, 44** at the other end operatively engageable with the associated latch lever **25** in the inoperative position of the control members. The latch engaging means are in the form of transversely extending flanges which overlie the latch lever so as to engage and cause pivotal downward movement thereof when the armature member is pivoted downwardly. Spring means **46, 47, 48, 49** are connected to the armature members so as to bias the armature members and the release means carried thereby upwardly toward the latched position. Electrically operable actuating means in the form of electromagnetic devices **52, 54, 56, 58** are provided to actuate the armatures. Each electromagnetic device includes a coil **60** energizable from a suitable source of potential through circuit means **61** having control means in the form of, for example, a key operated switch **62** and/or input control circuitry **64** of an associated input device such as a reader means or the like. A core **66** is magnetized when coil **60** is energized and armature member **37** is attracted and pulled downwardly about pivot **40** to the position shown in FIG. 1, to actuate latch **24** and release the functional operation slide element.

Each armature member comprises a plate portion **68** having a transversely bent attaching flange **70** integrally formed along the bottom thereof. The latch actuating means is formed by a flange **44** which is also integral with and transversely bent from the plate portion **68**. An armature plate **72** is attached to the flange **70** and extends generally over the core **66**. A flux return path is provided by a portion **74** of the plate **72** extending beyond the coil **58** and core **66** in closely spaced realtionship to a flux return flange **76** integrally formed on bracket means **78**.

The bracket means supports the electromagnetic means and the armature members in parallel side by side relationship and comprises an attaching portion **80** which is securely fastened by any suitable means to a portion of the printer frame **81**. The electromagnets are mounted on a support portion **82** formed by a generally U-shaped portion of the bracket means including spaced wall portions **84, 86**. At each end of the bracket, shaft supporting flanges **88, 90** are provided. An armature shaft **92** and a spring attaching rod **94** extend between the supporting flanges. A spacer sleeve **95** is mounted between the armature lever **34** and flanges **88**, and spacer sleeves **96, 97, 98, 99** are connected to the armature levers **34, 35, 36, 37**.

Thus, it may be observed that the disclosed apparatus has the advantage of permitting the mechanical selection apparatus **32** of the printer to be completely bypassed during either manual key lever operation of the printer by use of switch **62** or automatic operation of the printer through an associated input device **64** such as a reader. The inventive concepts are disclosed herein by reference to an illustrative embodiment of the invention which may be variously otherwise embodied and it is intended that the appended claims be construed so as to include various alternative uses of the inventive concepts except insofar as limited by the prior art.

The invention claimed is:

1. Functional operation control apparatus for a printer comprising:

selection members **10–16** movable between an operative position for causing selected functional operations in the printer and an inoperative position preventing selected functional operations in the printer,

latch means **18–24** pivotally mounted on each of said members and being operative to hold the members in the inoperative position until released,

manually operable latch release means engageable with said latch means to pivotally displace said latch means relative to said members,

electrically operable latch release means operatively associated with each of said latch means in the inoperative position of said members and being operative to release said latch means and permit movement of the associated member to the operative position,

each of said electrically operable latch release means including:

electrically operable magnetic means **52–58**,

circuit means **61** for selectively energizing said magnetic means,

control means **62–64** in said circuit means to selectively energize said magnetic means and including a first control means **62** operable by key selection in the printer and a second control means **64** operable by input signals derived from an associated input device,

an armature member **37** pivotally mounted at one end and releasably engageable with the latch means of the associated member at the other end, and

said armature member being pivotally displaced by said magnetic means upon selective energization by either said switch means or by input signals from said input device.

2. Functional operation control means for a printer of the type having a plurality of selectively operable selection members **10–16** movable upon selection between operative and inoperative positions with pivotally movable latch means mounted on said members to hold the members in the inoperative position until selected, and comprising for each member:

latch release means **18–24** pivotally movably supported for pivotal movement between an operative position and an inoperative position,

an abutment **26** carried by said latch release means, said abutment being engageable with said pivotally movable latch means in the operative position and releasing said pivotally movable latch means during movement of said latch release means from the inoperative position to the operative position,

a magnetic armature **72** carried by said latch release means,

and an electrically operable magnet **66** mounted in operative relationship to said magnetic armature and being selectively operable to move said magnetic armature and said latch release means between the operative position to the inoperative position,

there being return means **49** operative to return said magnetic armature and said latch release means from the operative position to the inoperative position to

cause latching engagement of said member after a selected functional operation occurs and said member is returned from the operative position to the inoperative position.

3. Operational control apparatus for a printer or the like having mechanically operable selection means for selecting various operations and being movable between a latched inoperative position and an unlatched operative position, latch means associated with said selection means to hold said selection means in the latched inoperative position until selected, electrically operable control means for actuating said latch means, input signal means to actuate said electrically operable control means, and said electrically operable control means comprising:

electromagnetic means selectively energizable by said input signal means,

pivotally mounted armature means movable by said electromagnetic means between an inoperative latch position and an operative release position relative to said latch means,

said armature means comprising an elongated plate member pivoted at one end and releasingly engageable with said latch means at the opposite end,

an attaching plate formed along one edge of said plate member intermediate the ends thereof,

an armature plate carried by said attaching plate and located adjacent to and in operative relationship with said electromagnetic means,

a release flange formed at the one end of said elongated plate member,

pivotal supporting means formed at the other end of said elongated plate member and receiving a pivot rod,

a spring attaching flange formed at the other end of said elongated plate member,

spring means associated with said release flange to return said armature means after movement by said electromagnetic means,

a common bracket means supporting said electromagnetic means and said armature means in side-by-side relationship adjacent said latch means,

a flux return flange formed on said bracket means adjacent said electromagnetic means,

and a portion of said armature plate extending over said flux return flange in closely spaced relationship therewith to provide a flux return path therebetween.

4. The invention as defined in claim **3** and having:

a plurality of electromagnetic means and armature means mounted in parallel side-by-side relationship,

each of said armature means being pivotally movable between the release portion and the latch position,

and a common pivot shaft mounted on said bracket means and pivotally supporting each of said armature means.

5. The invention as defined in claim **4** and having:

a common spring rod mounted on said bracket means in parallel spaced relationship to said common pivotal shaft,

and spring means attached at one end to said armature means and at the other end to said spring rod to pivotally bias said armature means to the inoperative position.

References Cited

UNITED STATES PATENTS

2,687,199	8/1954	Goodale et al.	197—19
2,717,686	9/1955	Seeber	197—19 X
2,973,079	2/1961	Hewatsch	197—19
3,135,371	6/1964	Young	197—16
3,233,715	2/1966	Flieg	197—16 X
3,294,117	12/1966	Eichemeyer et al.	197—19 X

ROBERT E. PULFREY, *Primary Examiner.*

E. S. BURR, *Examiner.*