

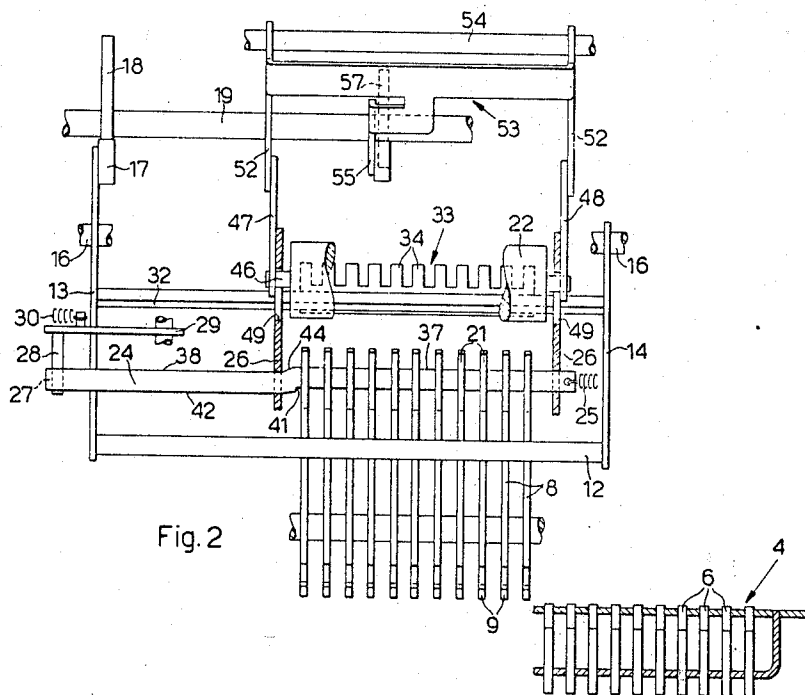
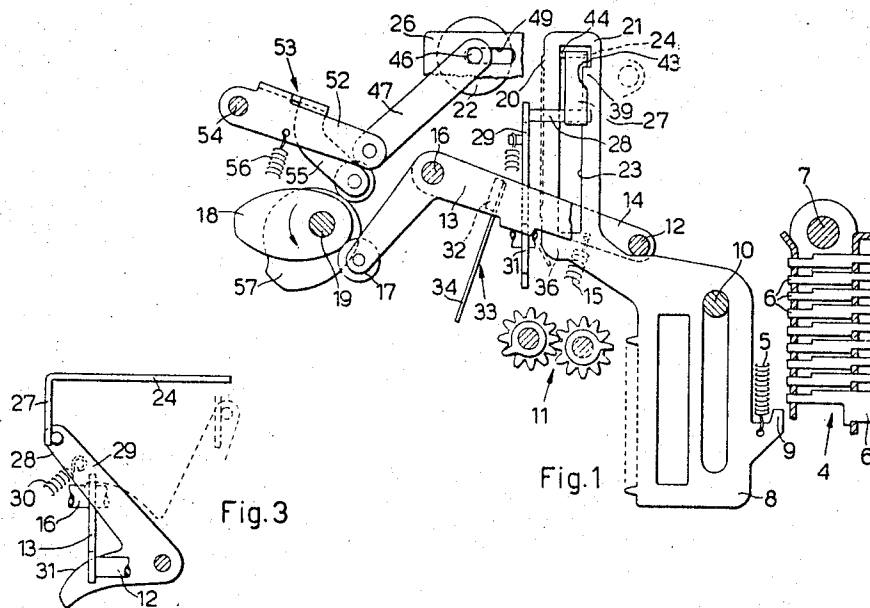
June 17, 1969

N. CAPELLARO ET AL

3,450,042

ZERO PRINTING CONTROL FOR ADDING AND PRINTING MACHINES

Filed Jan. 17, 1968



INVENTORS
NATALE CAPELLARO
CARLO BELLIS

BY *John Toggemburger*
AGENT

1

3,450,042

ZERO PRINTING CONTROL FOR ADDING AND PRINTING MACHINES

Natale Capellaro, Ivrea, and Carlo Bellis, Strambino, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy, a corporation of Italy

Filed Jan. 17, 1968, Ser. No. 698,597

Claims priority, application Italy, Jan. 17, 1967,

50,170-A/67

Int. Cl. B41j 1/40; G06c 15/42

U.S. Cl. 101-93

4 Claims

ABSTRACT OF THE DISCLOSURE

A zero printing control device for adding machines comprises a platen movable to strike against a set of type carriers integral with a corresponding set of differential actuators and adapted to present the zero type in front of the platen when the corresponding actuator is in the zero position, and a spring urged slide transversely variably movable from left to right. The slide is provided with an edge having a first portion adapted to engage the type carrier representing significant digits, substantially at the side opposite the type face to be struck by said platen, and a second portion offset with respect to said first portion to allow the type carriers representing nonsignificant zeros to be removed from the paper during the striking movement of the platen.

Background of the invention

The present invention relates to a zero printing control device for adding machines or the like, which control device is adapted to prevent the printing of nonsignificant zeros and comprises a platen which is movable to strike against a set of type carriers, a set of actuators each of which is differentially movable from a zero position to represent an amount, is integral with a corresponding one of said actuators and is adapted to present the zero type in front of said platen when the corresponding actuator is in said zero position and a spring-urged slide transversely movable with respect to said type carriers from left to right until it is arrested by the first type carrier that has been displaced out of said zero position.

In a known device of this type, the type carriers are located at rest in an under zero position so that they have to be displaced in order to print the significant zeros. Furthermore, the type carriers in this known device are sensed by a set of printing control latches which are adapted to prevent the printing of the nonsignificant zero in a known manner, so that the device for preventing the printing of the nonsignificant zeros is both intricate and expensive.

In another known device, the type carriers are located at rest in a zero position and a single slide is movable transversely from left to right until it is stopped against the first type carrier which has been displaced out of the zero position. The slide controls a set of independent hammers which act on the rear side of the paper and consequently this device is also intricate and expensive.

Summary of the invention

These disadvantages are obviated by the zero printing control device according to the present invention which is extremely simple and reliable in operation and which is characterized in that the said slide is provided with an edge having a first portion adapted to engage said

2

first type carrier and the type carriers on the right thereof substantially at the side opposite the type face to be struck by said platen, said edge having also a second portion offset with respect to said first portion to allow the type carriers on the left of said first type carrier to be removed from the paper during the striking movement of said platen so as to prevent the nonsignificant zeros from being printed.

A preferred embodiment of this invention will now be described by way of example with reference to the accompanying drawings.

Brief description of the drawings

FIG. 1 is a fragmentary longitudinal section of an adding machine mechanism incorporating a control device for preventing the printing of nonsignificant zeros;

FIG. 2 is a fragmentary plan view of the mechanism of FIG. 1;

FIG. 3 is a front view of a detail of the mechanism of FIG. 1.

Description of the preferred embodiments of the invention

With reference to the FIG. 1, 4 indicates a conventional carriage carrying the setting stop pins in a ten-key keyboard adding machine. The carriage 4 comprises, in each order, a column of stop pins 6 for the different figures, which pins are settable by displacing them rearwardly (leftward in FIG. 1). The carriage 4 is furthermore transversely movable step-by-step along a bar 7 in known manner.

The setup stop pins 6 are adapted to cooperate with shoulders 9 of a set of actuators in the form of vertical racks 8 which are normally located in a zero position. The racks are differentially movable from this zero position under the control of an universal bar 12, according to the amount set up on the carriage in the accumulation cycles, or according to the amount accumulated in a register 11 in the total-taking cycles. The racks 8 are vertically slidable on a stationary shaft 10 and are pushed upwards against the bar 12 by the action of springs 5.

The universal bar 12 is secured to the outer ends of two arms 13 and 14 (FIG. 2) fulcrumed on a stationary shaft 16 (FIG. 1). The arm 13 forms part of a ball-crank lever, the other arm of which is provided with a roller 17 which is held by a spring 15 against the surface of a cam 18 fixed on a shaft 19 which constitutes the main shaft of the machine.

Each rack 8 has a portion 21 which constitutes a type carrier and, when the corresponding rack 8 is in the rest position, presents a zero character 20 opposite a paper-carrying platen 22. Each portion 21 is formed with a window 23 through which extends a slide 24 (FIG. 2) adapted to slide transversely in bearings provided in stationary brackets 26 and biased by a spring 25 to move from left to right. The slide 24 is provided with a bent lug 27 (FIG. 3) by means of which it contacts a pin 28 secured to one arm of a bellcrank lever 29 biased by a spring 30 which is weaker than the spring 25. The other arm of the bell-crank lever 29 is provided with a shoulder 31 which is normally in contact with the lower edge of the arm 13.

Secured on the arms 13 and 14 is a further bar 32 (FIG. 2) to which is secured a row of leaf springs 34 which together form a yieldable toothed rack 33. Each spring 34 (FIG. 1) is adapted to cooperate with a shoulder 36 of the corresponding rack 8.

The slide 24 (FIG. 2) furthermore has a first portion 37 of its rear edge, which is normally in contact with the rear edge of the window 23, and a second portion 38 of its rear edge, which is offset with respect to the portion 37. Each window 23 (FIG. 1) is provided with a shoulder 39 which is adapted to be brought into the path of a shoulder 41 (FIG. 2) on the slide 24 when the corresponding rack 8 is moved out of the zero position. The slide 24 furthermore comprises a third portion consisting of an edge 42 adjacent and to the left of the shoulder 41 and adapted to cooperate with a shoulder 43 (FIG. 1) of the window 23.

Finally, the slide 24 (FIG. 2) is provided with a cam element 44 located between the portion 37 and the portion 38. This cam element 44 is adapted, after the platen has been struck, to engage the rear edge of the windows 23 of the racks 8 corresponding to the nonsignificant zeroes. The platen 22 is integral with a shaft 46, the ends of which are journaled in bearings in two arms 47 and 48 and are adapted to slide in two slots 49 (FIG. 1) formed in stationary parts 26 of the frame, of the machine. The arms 47 and 48 are connected respectively to two arms 52 of a bail 53 which is pivoted on a stationary shaft 54 and is provided with a third arm 55 biased by a spring 56 to cooperate with a cam 57 on the shaft 19.

The operation of the mechanism described above is as follows:

During each revolution of the main shaft 19, the cam 18 rocks the arms 13 and 14 counterclockwise, thereby lifting the universal bar 12. This latter is followed by those racks 8 which, in the accumulation cycles, are variably stopped by the set stop pins 6, or by a conventional zero plate not shown in the drawings. In the total taking cycles the racks 8 are variably stopped according to the amount taken from the register. The racks 8 then position the character corresponding to the stroke performed by each rack 8 in front of the platen 22. The arm 13 rocking counterclockwise furthermore allows the bellcrank lever 29 (FIG. 3) to be rocked clockwise, since the force of the spring 25 (FIG. 2) overcomes that of the spring 30 (FIG. 3). The slide 24 (FIG. 2) is thus displaced from left to right until it is brought to rest by the shoulder 41 engaging the shoulder 39 (FIG. 1) of the window 23 of the first rack from the left which has been displaced to the zero position which represents the highest order of the amount to be printed. Consequently, the slide 24 releases from the portion 37 (FIG. 2) and locates over the portion 38 all those racks 8 which are located to the left of the rack that has been displaced to the highest order of the amount to be printed.

As the universal bar 12 reaches the position shown in broken lines in FIG. 1, the springs 34 of the resilient toothed rack 33 (FIG. 2) push against the shoulders 36 of those racks 8 which have been left in their zero position. The racks 8 which are located over the portion 38 of the slide 24 are thus rocked clockwise through a small angle about shaft 10, while the springs 34 corresponding to the racks positioned over the portion 37 of the slide 24 are slightly flexed. Immediately after this, the cam 57 advances the platen 22 by means of the bail 53, the arms 47 and 48 and the shaft 46, until it strikes against the characters selected by those racks 8 which are located over the portion 37 (FIG. 2) of the slide 24, thereby causing corresponding amount to be printed on a conventional paper strip (not shown). The characters 20 of the nonsignificant zeros having been withdrawn by the springs 34 cause no impression to be made on the paper strip.

After the printing operation, the cam 18 returns the universal bar 12 (FIG. 1) by causing the arms 13 and 14 to rock in a clockwise direction. The arm 13 then rocks the lever 29 (FIG. 3) counterclockwise so as to return the slide 24 to the left. The cam element 44 (FIGURE 2) of the slide now engages the rear edges of the windows 23 of the racks 8 corresponding to the non-

significant zeros so as to return these racks to their starting positions.

In the case of a total-taking cycle, as the register 11 becomes disengaged from the racks 8 immediately after the printing operation, the racks 8 corresponding to the nonsignificant zeros tend to move upwards until they are stopped against the bar 12. The shoulders 43 then engage the portion 42 of the slide, thereby preventing the racks 8 from continuing to move upwardly.

After the printing of the total, the slide 24 is returned to the left as soon as the portion 42 of the slide clears the shoulders 43 of the racks 8 corresponding to the nonsignificant zeros and these last-mentioned racks are moved upwardly by the action of the respective springs 5 until they are brought to rest one after the other against the universal bar 12 which is being returned.

It will therefore be apparent that the slide 24 is provided with a first portion 37 adapted to act as a support for those type carriers 8, 21 which are positioned according to the various orders of the amount to be printed during the striking operation of the platen 22, and with a second portion 38 adapted to allow those type carriers which are positioned in accordance with the nonsignificant zeros to be released during the striking operation of the platen 22 so as to prevent such zeros from being printed.

As soon as the platen 12 is brought into contact with the characters, the racks 8 which are not supported by the portion 37 of the slide are released so that they can move forward in order to prevent the nonsignificant zeros from being printed. Therefore, the function of the springs 34 is only to prevent the said racks from slightly smudging the paper. Such smudging would, however, be acceptable in this type of machine and the springs 34 could, therefore, be omitted.

What we claim is:

1. A zero printing control device for adding machines or the like, comprising a platen movable to strike against a set of type carriers, a set of actuators differentially movable from a zero position to represent an amount, each one of said type carriers being integral with a corresponding one of said actuators and being adapted to present the zero type in front of said platen when the corresponding actuator is in said zero position, and a spring-urged slide transversely movable with respect to said type carriers from left to right until it is arrested by the first type carrier that has been displaced out of said zero position, characterized in that the said slide is provided with an edge having a first portion adapted to engage said first type carrier and the type carriers on the right thereof substantially at the side opposite the type face to be struck by said platen, said edge having also a second portion offset with respect to said first portion to allow the type carriers on the left of said first type carrier to be removed from the paper during the striking movement of said platen so as to prevent the nonsignificant zeros from being printed.

2. A device according to claim 1, characterized in that each one of said type carriers has a part adapted to be located in the path of a shoulder of said slide when the corresponding type carrier is located out of said zero position, said slide having a second edge adjacent said shoulder and opposite said first portion, said second edge being adapted to prevent the type carriers corresponding to said nonsignificant zeros from being moved out of said zero position.

3. A device according to claim 1, comprising means operable for transversely return said slide, and a cam portion provided on said slide between said first and second portions for returning the removed type carriers during the return movement of said slide.

4. A device according to claim 1, comprising a set of leaf springs adapted to engage said type carriers to assist the removal of the type carriers on the left of said first type carrier from said platen.

5

References Cited

UNITED STATES PATENTS

1,702,628	2/1929	Bryce	101—96
1,933,309	10/1933	Bryce et al.	101—93
2,019,901	11/1935	Furman	101—93 5
2,131,918	10/1938	Mills	101—93

6

2,387,861	10/1945	Smith et al.	101—93
2,507,117	5/1950	Mueller	101—93

WILLIAM B. PENN, *Primary Examiner.*

U.S. Cl. X.R.

235—144