United States Patent

[11] **3,544,000**

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[21] Appl. No. **718,658**
[22] Filed **April 4, 1968**
[45] Patented **Dec. 1, 1970**

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[32] Priority **April 6, 1967**
[33] **Italy**
[31] **No. 51,213/67**
Pat. 800,724

[54] DEVICE FOR CONTROLLING THE PRINTING OF THE DECIMAL POINT IN A CALCULATING MACHINE OR THE LIKE

3 Claims, 3 Drawing Figs.

[52] **U.S. Cl.** **235/60.15,** 235/60.28, 235/60.25, 235/61
[51] **Int. Cl.** **G06c 19/00.** G06c 29/00
[50] **Field of Search** ..... 235/60.15, 60.28, 61(D.P.I.), 63(D.E.), 60.25

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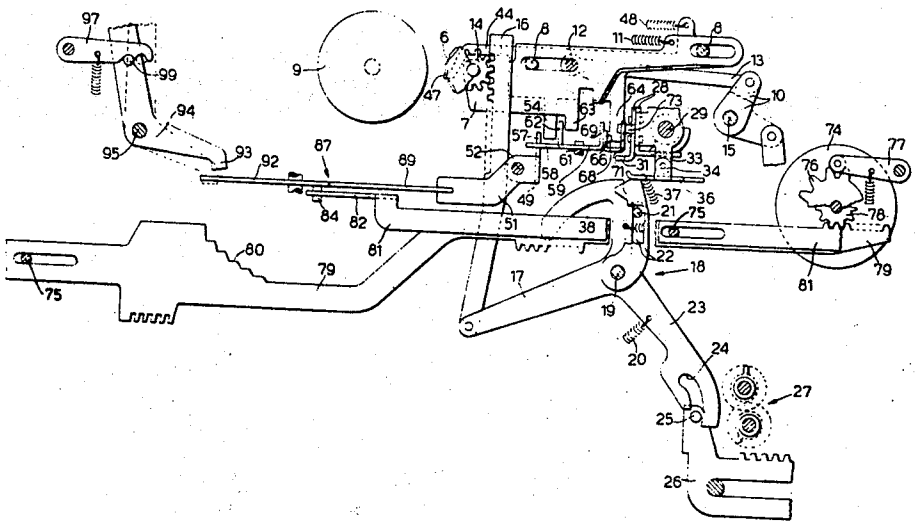
ABSTRACT: In a calculating machine, wherein some typecarriers are interspersed with a group of decimal point printing elements individually selectable by a transversely movable plate and wherein a member is variably settable for causing a predetermined number of orders to be dropped in printing the total, the plate and the members are set simultaneously by a common knob. The plate is adapted to entrain a zero printing suppressing slider along the left. The suppressing slider normally allows the typecarrier of the lower order to print, whereas another slider is transversely movable one step with respect to the suppressing slider for normally preventing said lower order typecarrier from printing.



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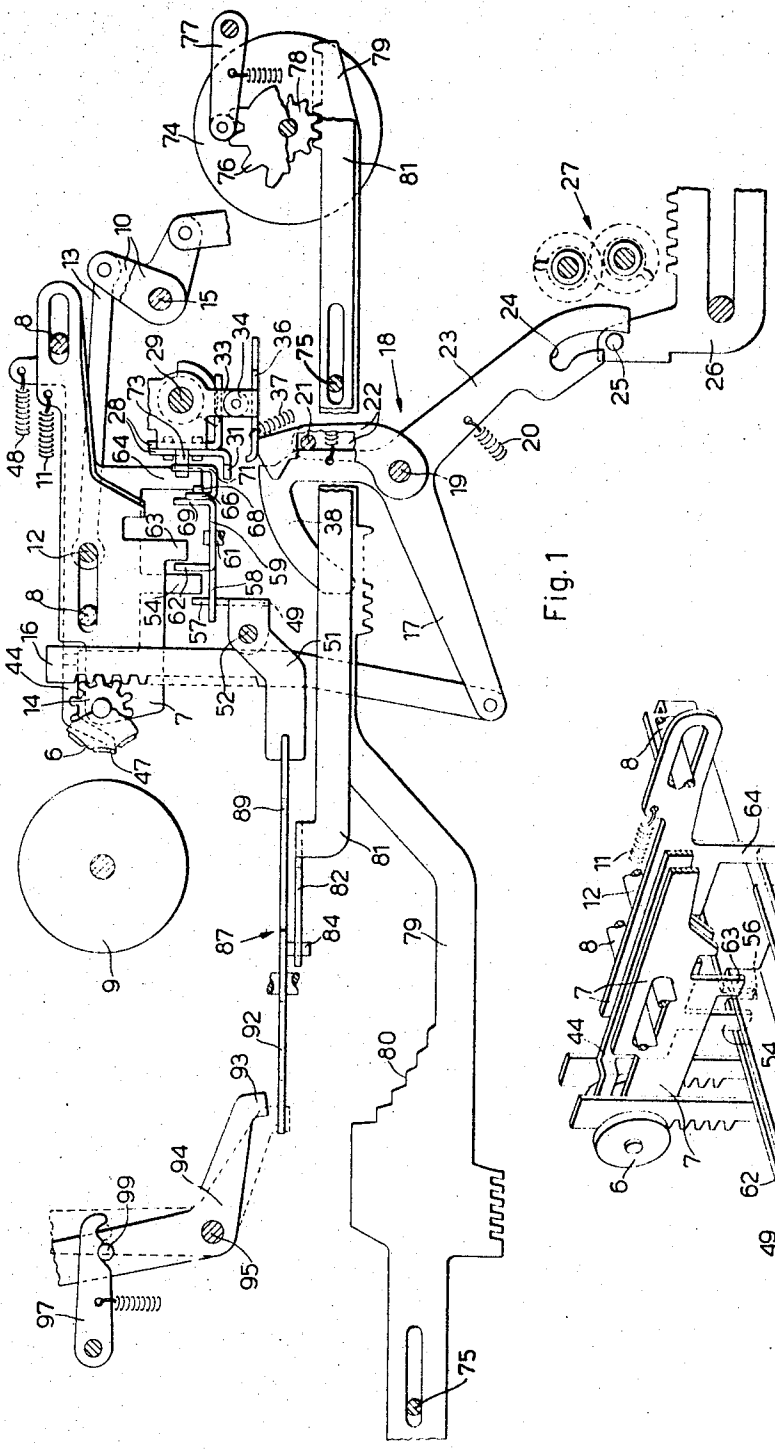

Fig. 1

Fig. 2

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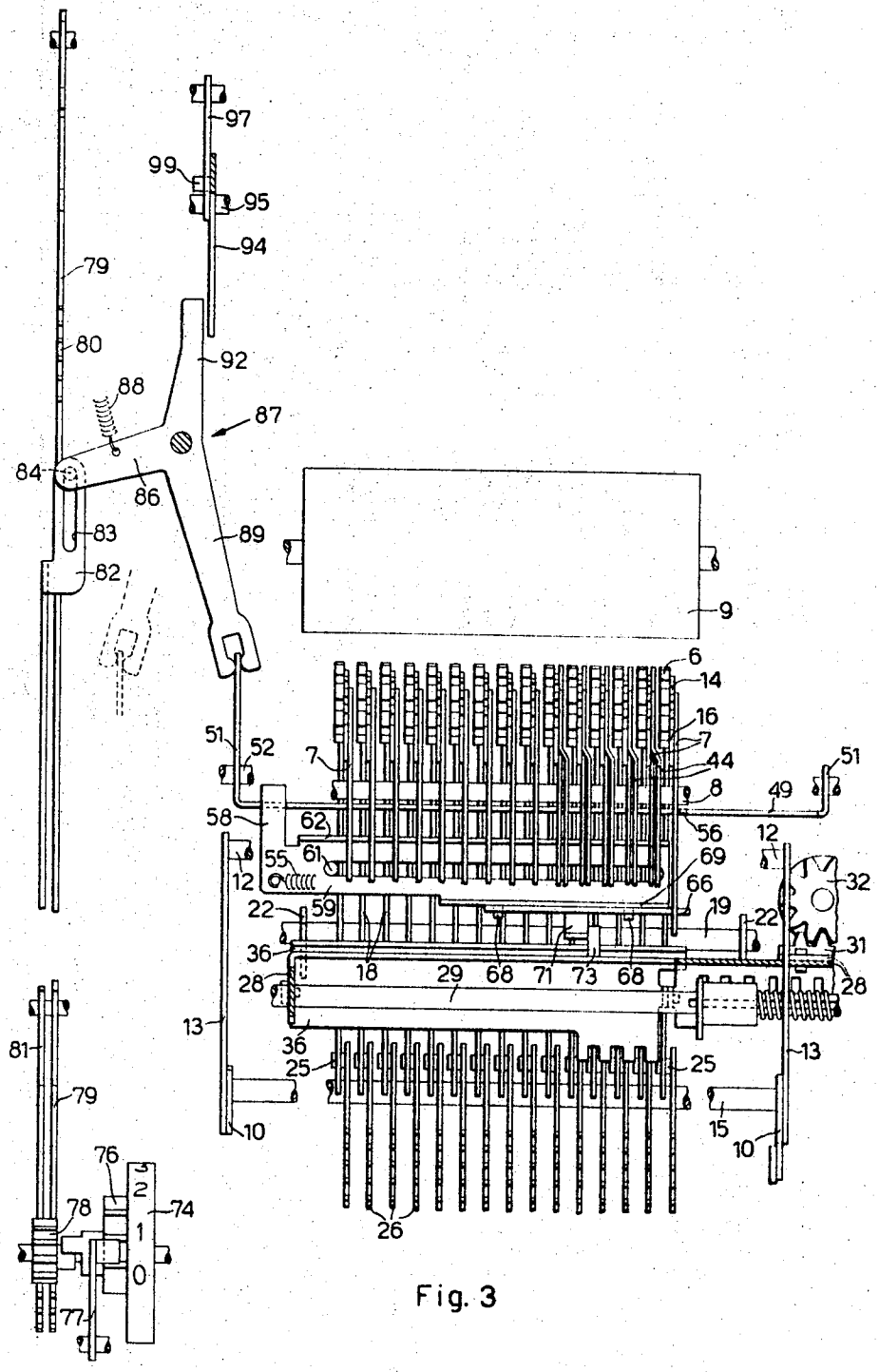

Fig. 3

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DEVICE FOR CONTROLLING THE PRINTING OF THE DECIMAL POINT IN A CALCULATING MACHINE OR THE LIKE

BACKGROUND OF THE INVENTION

The present invention relates to a device for controlling the printing of the decimal point in a calculating machine or the like comprising a totalizer, a series of typecarriers for printing the digits of a total taken from said totalizer, at least some of which are interspersed with a group of normally inoperative decimal point printing elements and wherein a first member is variably settable for selecting one of said elements for printing the decimal point, and a second member is variably settable for causing a predetermined number of orders of said totalizer to be dropped in printing said total.

Calculating machines are known in which a member is variably settable to permit one of the decimal point printing elements to print simultaneously with the adjacent typecarriers. There are moreover known calculating machines in which a predetermined number of orders of the total can be dropped under the control of a variably settable member. In a known calculating machine of this second type the member controlling the printing of the decimal point is independent of the member controlling the dropping of said order. Therefore this machine requires a large number of parts which make the machine complicated and costly. Moreover, with two members adapted to be set independently, the operator may often make a mistake setting the number of decimals and the number of orders to be dropped.

SUMMARY OF THE INVENTION

These and other disadvantages are obviated by the device according to the invention, which is very simple and reliable in operation.

The device according to the invention is characterized in that said first and second members are set simultaneously by a common manual setting member.

An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a partial longitudinal section, from the left, of a calculating machine incorporating a device for controlling the printing of the decimal point according to the invention;

FIG. 2 is a left-hand perspective view of a detail of FIG. 1;

FIG. 3 is a partial plan view of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

The device for controlling the printing of the decimal point is incorporated in a calculating machine comprising a series of typecarriers adapted to print the various orders of an amount. More particularly, each type carrier is constituted by a typewheel 6 (FIG. 1) rotatably mounted on a slider 7 slidable on two stationary rods 8 to cause the respective wheel 6 to strike against a platen 9, but normally bearing by the action of a spring 11 against a universal bar 12. The latter is carried by a pair of connecting rods 13 connected to two arms 10 secured to a shaft 15 rotatable in the machine frame. The shaft 15 is adapted to be rotated in an anticlockwise direction at each printing cycle in a known manner.

Each typewheel 6 is equipped with a pinion 14 constantly in mesh with a rack 16 pivoted on an arm 17 of a corresponding three-armed lever 18 fulcrumed on a stationary shaft 19. Each lever 18 is normally urged by a spring 20 to bear against a universal bar 21 carried by two arms 22 adapted to be rotated in a clockwise direction at each printing cycle in known manner. Each lever 18 carries a second arm 23 having a slot 24 engageable by a stud 25 of a corresponding actuating rack 26 which is longitudinally reciprocable and is adapted to cooperate in known manner with a totalizer 27.

The calculating machine also includes a slider 28 slidable transversely on a stationary bar 29 and provided with a toothed edge 31 in engagement with a pinion 32 (FIG. 3). The latter is connected to a conventional set up carriage (not shown in the drawings) in such manner that the carriage and the slider 28 move in synchronism in the transverse direction.

Pivoted on two projections 33 (FIG. 1) of the slider 28 are two lugs 34 of a plate 36 normally bearing by the action of a spring 37 against the upper edge of one of the two arms 22. The plate 36 is adapted to sense the upper edge of an arcuate extension 38 of each lever 18.

During the setting of a new amount in the carriage, the slider 28 is therefore shifted to the left step by step as described in the U.S. Pat. No. 3,319,882. During the total cycles, on the other hand, the bar 21 releases the levers 18, which are shifted under the control of the racks 26 to predispose the typewheels 6 for printing the amount represented by the racks 26. The plate 36, in turn, bears against the extensions 38, while the pinion 32 (FIG. 3) is rotated in a clockwise direction, causing both the slider 28 and the set up carriage to move to the left until the plate 36 is brought to the left of the first lever 18 on the left which has been turned, as described in the U.S. Pat. No. 3,260,449.

The calculating machine moreover comprises five decimal point printing elements, which are normally inoperative and interspersed with the first five sliders 7 (FIG. 3) starting from the right. Each of these elements is constituted by a slider 44 (FIG. 1) which is also slidable on the rods 8 and normally bear under the action of a spring 48 against the universal bar 12. Each slider 44 is provided with a decimal point type 47 disposed alongside the type of the wheel 6 which is predisposed for printing. A first variably settable member for selecting one of the sliders 44 is constituted by a plate 49 slidable transversely by means of two drilled lugs 51 along a stationary bar 52. The plate 49 is adapted to cooperate with a projection 54 provided on each slider 44 and is provided with a notch 56 (FIG. 2) to allow the passage of the projection 54 of one slider 44 at a time.

The plate 49 is moreover provided with a shoulder 57 normally contacted under the action of a spring 55 by a projection 58 of a transverse slider 59 slidable on a stationary stud 61 and on the machine frame, not shown in the drawings. The slider 59 is provided with a bent edge 62, which is normally disposed behind a projection 63 of each slider 7. The slider 7 of the lower order (FIG. 3) is normally to the right of the edge 62 and is provided with another projection 64 (FIG. 2) adapted to cooperate with another slider 66, The latter is provided with two slots 67 having a length corresponding to one printing pitch and slidable transversely on two studs 68 secured to one bent edge 69 of the slider 59. The slider 66 is provided with a bent lug 71 normally bearing under the action of a spring 72 against a pin 73 on the slider 28 (FIG. 3).

The calculating machine moreover comprises a graduated knob 74 (FIG. 1) secured to a pinion 76 in engagement with a spring-loaded positioning member 77, Moreover, secured to the knob 74 is also a second pinion 78 in mesh with a member or rack 79 slidable on a pair of stationary pins 75. The rack 79 is variably settable for causing a predetermined number of orders of the totalizer to be dropped in printing the total. To this end, by sensing a stepped portion 80 of the rack 79, the totalizer 27 is transversely shifted to the right a number of steps equal to the digits to be dropped before taking the total in the manner described in the U.S. Pat. No. 3,397,837 with reference to the rack indicated therein by the reference 206.

The pinion 78 is moreover in mesh with a second rack 81 slidable on one of the pins 75 and provided at the rear with a bent lug 82 (FIG. 3) formed with a slot 83 having a length corresponding at least to five steps of the knob 74. The slot 83 is engaged by a pin 84 fast with an arm 86 of a three-armed lever 87 and normally bearing under the action of a spring 88 against the rear end of the slot 83. A second arm 89 of the lever 87 terminates in a forked end in engagement with the lug 51 on the left of the plate 49. A third arm 92 of the lever 87 is

adapted to cooperate with a projection 93 (FIG. 1) of a lever 94 fulcrumed on a stationary pivot 95 and adapted to be manually located in one of two positions, where it is maintained by a spring-loaded positioning member 97 cooperating with a stud 99 of the lever 94.

The device for controlling the printing of the decimal point operates as follows.

It will be assumed at first that the lever 94 is in the position indicated in solid lines in FIG. 1 and that it is desired to set two factors each having a predetermined number of decimal orders between one and five for example two decimal orders. The knob 74 is rotated clockwise two steps from the zero position shown in FIG. 1, whereby the rack 81 is shifted to the rear two steps. The rack 81 then causes the spring 88 (FIG. 3) to rock the lever 87 clockwise, thereby shifting the plate 49 two steps to the left. The plate 49 thus brings the notch 56 into correspondence with the projection 54 of the second slider 44 from the right, while the other four sliders 44 are arrested by the plate 49. As the plate 49 moves to the left, it carries the slider 59 and the slider 66 along by means of the shoulder 57 (FIG. 2) and the projection 58. The slider 59 is thus located with its edge 62 immediately to the left of the projection 63 of the third slider 7.

If less than three orders are set up for each factor, the slider 66 releases the projection 64 (FIGS. 1 and 2) of the first slider 7 on the right, while the edge 62 releases the projection 63 of the following two sliders 7 and in this way the first three typewheels 6 (FIG. 3) starting from the right are allowed to print, the third of which typewheels 6 (FIG. 2) prints a zero at the left of the decimal point in any case, while the other two typewheels 6 print the digits set or print zeros in the decimal orders in which no digit has been set.

If, on the other hand, more than three orders are set up, the orders to the left of the second are integer orders. During the setting of the first two orders, the slider 28 moves nearer step by step with its pin 73 to he the lug 71 of the slider 66. On the setting of the third order, the pin 73 engages the lug 71, shifting the slider 66 one step without effecting the slider 59. On the setting of the following orders, the slider 59 is then carried along step by step to the left, so that during the printing operation the projections 63 of the corresponding sliders 7 are freed from the control of the edge 62.

The knob 74 simultaneously with the rack 81 shifts the rack 79 two steps to the rear. The rack 79 is thus set for causing the totalizer 27 to be shifted to the right and equal number of steps before taking the product, thus dropping in printing the product a number of orders equal to the decimal orders of each factor. The product is thus printed under the control of the sliders 66 and 59, with a number of decimal orders equal to that of the factors, while the decimal point is printed in alinement with that of the factors under the control of the plate 49.

If it is not desired to preset the position of the decimal point, while the knob 74 is at zero, the lever 94 (FIG. 1) is brought manually into the position shown by dash lines. When the knob 74 is then rotated, the lever 87 (FIG. 3) cannot be rocked clockwise, since the arm 92 is arrested by the projection 93 (FIG. 1) of the lever 94. The rack 81 is then shifted to the rear, sliding by means of the slot 83 (FIG. 3) on the pin 84 of the arm 86 of the lever 87. The plate 49 therefore does not take part in the movement, while the rack 79 is predisposed for causing the predetermined number of orders to be dropped in printing the product.

If the pin 73 is not shifted to the left during a cycle, the first slider 7 on the right remains locked by the slider 66, while the other sliders 7 remain locked by the edge 62. If only one order is now set up the pin 73 of the slider 28, engages the lug 71 and shifts the slider 66 to the left only one step. The slider 66 therefore releases the projection 64 of the slider 7 in the lower order, which strikes the digit set against the platen 9 during the actuating cycle. If, on the other hand, more than one order is set, after the first step performed by the slider 66 alone this carries along the sliders 66 and 59, which therefore release the sliders 7 of the higher orders, thus striking the respective digits against the platen 9 during the actuating cycle.

It is understood that various modifications, improvements and additions of parts may be made in the described device without departing from the scope of the invention. For example, the plate 49 may have a plurality of notches 56 spaced three steps one from the other to permit a plurality of sliders 44 to print the decimal point, in order to divide the amount into groups of three orders. From what has been seen hereinbefore, it is moreover apparent that the slider 59 always ensures the printing of a zero to the left of the decimal point when the amount printed does not have whole numbers. If it is desired to avoid printing this zero on the left, as happens in British and American practice, it is sufficient to provide the slider 59 with such an edge 62 to prevent normally also the printing of the lower order. The slider 66 can then be eliminated and the pin 73 acts directly on the slider 59.

I claim:

1. A printing calculating machine comprising a totalizer, a series of typecarriers for printing the various orders of a total taken from said totalizer, and a device for controlling the printing of a decimal point having a group of normally inoperative decimal point printing elements interspersed with a group of said series of typecarriers, wherein the improvement comprises in combination:

a. a first member variably settable for selecting one of said elements for printing the decimal point;

b. a manual rotatable knob;

c. a pinion secured to said knob;

d. a first rack connected with said first member, and meshing with said pinion for variably setting said first member upon rotation of said knob;

e. a second member variably settable for causing a predetermined number of the lowest orders to be dropped in printing said total comprising a second rack meshing with said pinion;

f. an intermediate member normally connecting said first member with said first rack; and

g. means manually operable for rendering said intermediate member inoperative.

2. In a printing calculating machine comprising a totalizer, a series of typecarriers for printing the various orders of a total taken from said totalizer, and a transversely movable suppressing slider for controlling said typecarriers to prevent the printing of the nonsignificant zeros, a device for controlling the printing of the decimal point having a group of normally inoperative decimal point printing elements interspersed with a group of said series of typecarriers, wherein the improvement comprises in combination:

a. a transversely movable plate provided with a notch allowing only one of said elements at a time to print the decimal point;

b. a settable member variably settable for causing a predetermined number of the lowest orders to be dropped in printing said total;

c. a common manual setting member for simultaneously moving said plate and setting said settable member; and

d. an entraining element provided on said plate for carrying said suppressing slider along to the left.

3. In a printing calculating machine comprising a totalizer, a series of typecarriers for printing the various orders of a total taken from said totalizer, and a transversely movable suppressing slider for controlling said type carriers to prevent the printing of the nonsignificant zeros, said slider normally allowing the typecarrier of the lower order to print, a device for controlling the printing of the decimal point having a group of normally inoperative decimal point printing elements interspersed with a group of said series of typecarriers, wherein the improvement comprises in combination;

a. a transversely movable plate provided with a notch allowing only one of said elements at a time to print the decimal point;

b. a settable member variably settable for causing a predetermined number of the lowest orders to be dropped in printing said total;

c. a common manual setting member for simultaneously moving said plate and setting said settable member;

d. an entraining element provided on said plate for carrying said suppressing slider along to the left;

e. another slider transversely movable one step with respect to said suppressing slider, said other slider manually preventing said lower order typecarrier from printing; and

f. means operable by said manual setting member for shifting said suppressing slider transversely through said other slider.