Jan. 27, 1953 E. L. WISE 2,626,748

ADJUSTABLE CROSSFOOTER PICKUP

Filed Dec. 4, 1951

Fig. 1

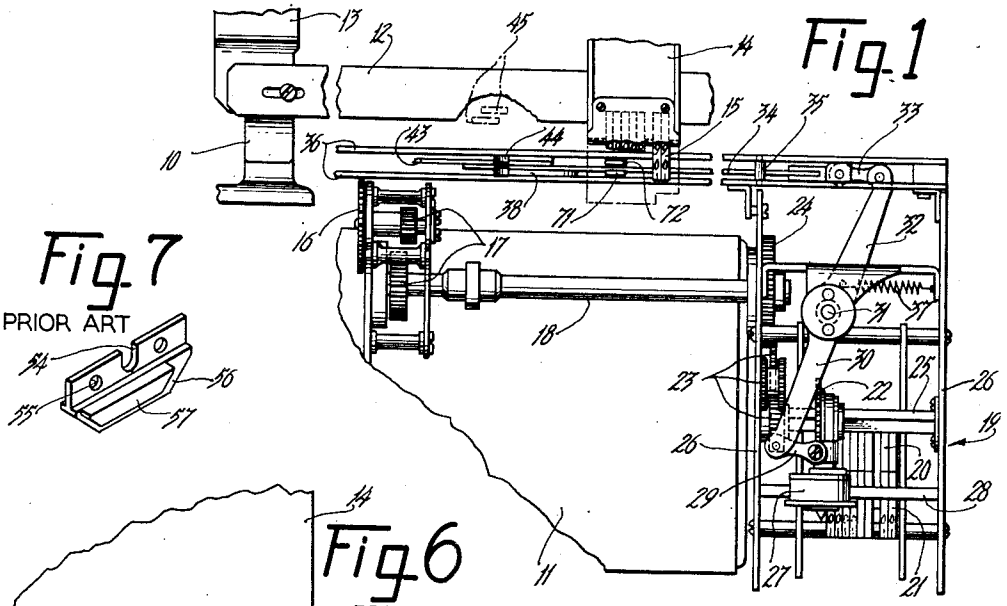


Fig. 7
PRIOR ART

Fig. 6
PRIOR ART

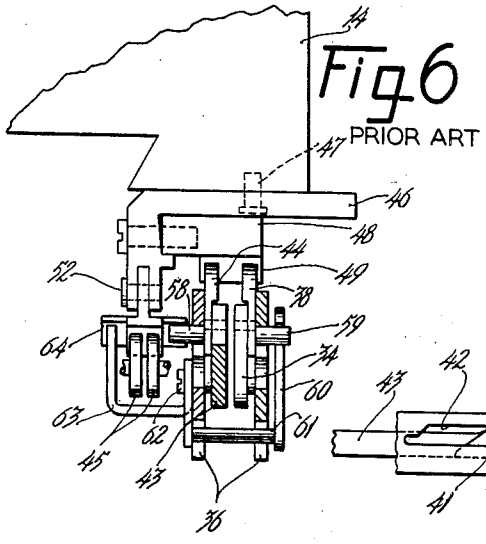


Fig. 2

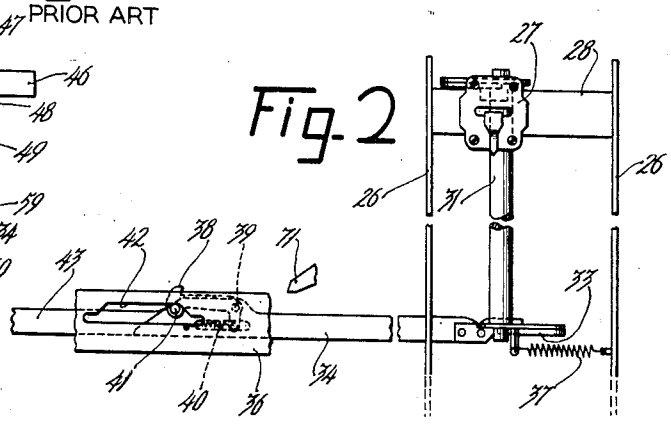


Fig. 4

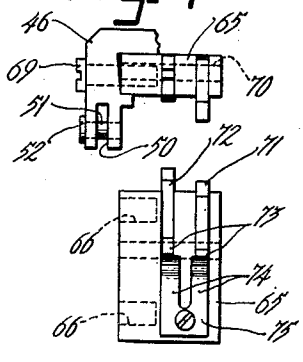
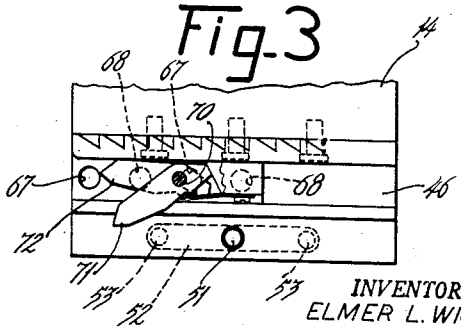


Fig. 5

Fig. 3



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ADJUSTABLE CROSSFOOTER PICKUP

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Application December 4, 1951, Serial No. 259,773

2 Claims. (Cl. 235—59)

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The present invention relates to combined computing and recording machines and more particularly to combined computing and typewriting machines wherein a plurality of so-called column registers and one or more cross-computing registers or crossfooters are provided for receiving amounts digit by digit as the numeral keys of the typewriter are operated.

In the type of machine to which this invention appertains, an actuator or master wheel is mounted for relative letter-feed movement with respect to the column registers and a master wheel is also provided for each crossfooter for a relative letter-feed movement with respect thereto. The master wheels are rotated in synchronism with one another by operation of numeral keys, and the relative movement between the crossfooter and the crossfooter actuator is effected by means on the column register as the column register and column register actuator are relatively moved.

The particular machine chosen to illustrate this invention is known commercially as the Elliott-Fisher accounting machine, but it will be apparent to those skilled in the art that certain aspects of the invention are equally applicable to machines of the Wahl type.

In the Elliott-Fisher machine, the master wheels are all mounted in the so-called head or type carrying portion of the machine which is mounted for letter-space movement over a subjacent flat platen. The crossfooters are also mounted in the head of the machine, while the column registers are mounted on a line-space frame having no letter-space movement. As the head is letter spaced through the zone of a column register, the column register master wheel moves into engagement with the various wheels of the column register and amounts are entered digit by digit into the register. There is a pick-up mechanism for each crossfooter master wheel and means has formerly been provided on certain of the column registers to contact one or both pick-up mechanisms as the head moves into the zone of the register to thereby, through such pick-up mechanism, cause the crossfooter master wheel to move step by step across the wheels of the crossfooter for simultaneous actuation of the register and crossfooter.

It frequently happens that, with a machine set up to operate simultaneously in one or both crossfooters while in the zone of a register, it becomes desirable to discontinue for extended periods the operation of one or the other or both crossfooters while continuing to operate in that

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register. Prior to the present invention, such extended suppression of the normal operation of a crossfooter was accomplished by means of a considerable amount of mechanism and accessory parts, as will become clear as the present specification continues.

It is an object of this invention to provide improved means mountable on a column register of a machine of the type referred to above which may be conveniently manipulated to either cause simultaneous operation of one or both crossfooters and the register or to suppress the operation of one or both crossfooters while permitting continued operation of the column register.

This and other objects, features and advantages will become apparent as the description of the invention proceeds.

Referring now to the drawing:

Figure 1 is a plan view of a portion of a machine with which the invention is adapted to be employed and showing the pick-up mechanism for the crossfooters,

Figure 2 is a front elevational view of a portion of the mechanism shown in Figure 1,

Figure 3 is a front elevational view of the lower portion of a column register showing a device of the present invention applied thereto,

Figure 4 is an end view of the structure illustrated in Figure 3,

Figure 5 is a bottom view of the device which in Figure 3 is shown applied to a column register,

Figure 6 is a view partially in section illustrating the prior art structure employed to prevent crossfooter operation in columns where crossfooters are normally operated, and

Figure 7 is a perspective view of a so-called neutralizer cam employed by the prior art for eliminating crossfooter operation.

A machine of the type to which this invention is particularly applicable is fully described in the copending application, No. 552,656, filed September 4, 1944, in the name of O. J. Sundstrand, and only so much of the machine is shown in the present drawing as is necessary for an understanding of the invention.

The machine shown and described in the copending Sundstrand application comprises a platen frame, a substantially flat platen supported in said frame, a line-space frame mounted on the platen frame for forward and rearward movement over the platen to line space, and a head or type carriage carried by the line-space frame and arranged for lateral movement on said frame in letter-spacing and return directions. In the drawing of the present application, a portion

of the line-space frame is indicated at 10 and a portion of the type carriage which is mounted for lateral movement on the line-space frame is indicated at 11. The machine is provided with the usual register bar 12 supported at its ends upon suitable uprights 13 on the line-space frame. Upon the register bar is fixed a column register 14 of any suitable construction and having the usual group of register wheels 15.

As shown in the above referred to Sundstrand application, the head 11 carries the usual series of type bars and mechanism for operating said bars including suitable keys. Upon successive operation of the keys, the head moves forward in letter-feed direction with a step by step motion under control of a suitable escapement mechanism.

A master wheel or column register actuator 16 is mounted in the head to mesh with the numeral wheels 15 of the register as the head moves into a computing zone. The master wheel is shifted step by step by the letter-spacing movement of the carriage from numeral wheel to the numeral wheel of the register to select the required denomination in said wheels. The master actuator wheel is differentially rotated to enter the numerals or digits into the column register in accordance with the depressed numeral keys by gearing 17 driven by a shaft 18 which is rotated differential amounts as described in the copending Sundstrand application.

The machine to which the present invention is particularly applicable is provided with a pair of cross-computing registers or crossfooters, but since they are identical in construction only one of them will be particularly described in the present application. In Figure 1 the right-hand crossfooter is generally designated at 19 and comprises number wheels 20 and indicator wheels 21 connected by suitable gearing. The crossfooter is provided with a suitable master actuator wheel 22 arranged to be advanced laterally step by step from denomination to denomination along the number wheels to correspond with the movement of the master wheel 16 from denomination to denomination along the numeral wheels of the column register. The master wheel 22 is differentially driven through suitable gearing 23 from a gear 24 fixed to one end of the shaft 18 to correspond with the differential rotation imparted by the master wheel 16 to the wheels of the column register.

The master wheel 22 is slidably mounted upon a rotatable square shaft 25 journalled in bearings in side frame plates 26 of the crossfooter. The mechanism for shifting the master wheel 22 along the shaft 25 comprises an actuator carriage 27 arranged to slide on a horizontal rail 28 secured in the frame of the crossfooter. The actuator carriage 27 is provided with an arm engaged within a groove in the master wheel 22 to cause the master wheel to follow the movement of said carriage and is connected by a link 29 to a forwardly extending crank arm 30 fixed to the upper end of a vertical rockshaft 31. A rearwardly extending arm 32 is fixed to the lower end of the rockshaft 31 and is connected by a link 33 to a longitudinally slidable coupling bar 34. The bar 34 is mounted for sliding movement on a plurality of rollers 35 between a pair of laterally spaced housing plates 36.

The rockshaft 31 is acted upon by a coil spring 37 connected with the arm 32 which tends to swing the shaft in a direction to maintain the carriage 27 in starting position with the master wheel 22 in a position just above the first number wheel 20. This spring, acting through the connecting mechanism, urges the coupling bar to the right, Figure 1. A coupling dog 38 is pivoted at 39 upon the coupling bar and is acted upon by a coil spring 40 which tends to swing same upwardly into position to engage and interlock with a lug secured to the base of the column register 14. A pin or stud 41 is mounted on the coupling dog 38 and engages in an elongated slot 42 formed in the adjacent housing plate 36, the stud cooperating with cams formed at the opposite ends of the slot to swing the dog downwardly out of engaging position with relation to the lug on the column register. Normally the dog 38 lies in its upper or operative position as shown in Figure 2 with the pin 41 located in the right-hand portion of the slot 42 and adjacent to the cam at the corresponding end of the slot. When the carriage has advanced the printing point to a position within one letter space of a columnar position on the work sheet at which a number is to be printed or a position at which the master wheel 16 of the column register actuating mechanism is within one space of the first number wheel 15 of a column register, the coupling dog 38 will engage the lug on the register and will hold the slide 34 stationary during the continued advance of the carriage. Because of the relative movement of the carriage upon which the crossfooter mechanism is mounted and the slide 34, the master wheel 22 will be advanced from denomination to denomination across the corresponding series of number wheels 20. When the master wheel 22 advances one step beyond the lowest denominational order of a column register, the pin 41 on the coupling dog is engaged by the cam at the left-hand end of the cam slot, Figure 2, and the dog is depressed out of engagement with the lug thereby releasing the coupling slide. The rockshaft is then swung by the spring 37 in a direction to carry the master wheel 22 back to its normal or starting position, and the coupling slide is moved back to the right to its starting position shown in Figure 2.

The coupling bar 34 and the parts associated therewith constitute a pick-up mechanism for relatively shifting the accumulator mechanism and the actuator mechanism of the crossfooter. As explained in the above referred to Sundstrand application, there is also a pick-up mechanism for the left-hand crossfooter but, in the present drawing, only a coupling bar 43 and dog 44 of the second pick-up mechanism are shown.

The normal operation of the crossfooters is addition but either one or both may be caused to perform subtraction by manipulation of levers provided for that purpose. Means is also provided for causing subtractive crossfooter operation in certain columnar positions and such mechanism is fully explained in the above referred to Sundstrand application, it being sufficient for the purpose of explaining the advantages of the present invention to point out that depression of rollers 45, Figures 1 and 6, normally causes the crossfooters to subtract.

In the prior art, as well as with the present invention, a generally L-shaped support 46 is secured to the bottom of each column register, as by means of screws 47. In the prior art, see Figure 6, a member 48 provided with a lug 49 was secured to the support 46 and as the type head moved into the zone of the column register, the lug 49 was contacted by the dogs 38 and 44 of the pick-up mechanisms, to thereafter cause

movement of the crossfooter master wheels into engagement with the numeral wheels of the crossfooters, as above described. If it was desired to work, say, in only the right crossfooter, a member 48 having a lug only wide enough to contact the dog 38 had to be provided. If it was desirable to work in the left crossfooter only, a lug positioned to contact only the dog 44 had to be provided. If both crossfooters were to be employed, a member 48 having a lug wide enough to contact both dogs 38 and 44, as shown in Figure 6, had to be provided. Thus, it was necessary to manufacture three different styles of members 48, and once one of them was attached to the register, it was necessary to remove the register from the machine in order to replace the member 48 to change crossfooter selection.

Automatic crossfooter subtraction is effected in the same manner in both the prior art and in the present machine. The vertical arm of the L-shaped support 46 is slotted as indicated in Figure 4 at 50, and a pin or rivet 51 is fixed in the center of said vertical arm and extends through the slot. A spring member 52 is held against one side of the vertical arm of the support 46 by a headed portion of the pin 51 and serves to maintain a pair of detent balls 53 within openings provided therefor in one leg of the vertical arm of the member 46 and in position to partially block the slot 50. When it is desired to perform subtraction for an extended period in a crossfooter, a subtraction cam is fitted within the slot 50. The subtraction cams are generally similar to the neutralizer cam shown in Figure 7 which is provided with a notch 54 for fitting around the pin 51 and with a pair of holes 55 for cooperation with the detent balls 53. The subtraction cam may have a camming portion wide enough to cooperate with both subtraction rollers 45 or may have a camming portion arranged to cooperate with only one of the rollers 45.

In the prior art, when it was desired to suppress the operation of a normally operated crossfooter, a so-called neutralizer cam was employed. Such a cam is shown in Figure 7 and was provided with a subtraction determining cam portion 56 and with a neutralizing cam portion 57. With the neutralizer cam mounted within the slot 50, the neutralizing portion 57 was contacted by a pin 58 on the pick-up dog 44 to rock the dog down out of position to be contacted by the lug 49, so that even though the column register had a lug for normally picking up the crossfooter, the crossfooter would not be picked up when a neutralizer cam was provided.

In the prior art, the pick-up dog 38 for the right crossfooter was provided with a pin 59 underlying a hooked arm 60 of a bail 61 pivoted on one of the housing plates 36 at 62 and having an operating arm 63. When it was desired to suppress operation of the right-hand crossfooter, a neutralizer cam having a camming portion 64 was employed and this camming portion was contacted by the operating arm 63 to thereby rock the hooked arm 60 in a direction to lower the dog 38 to a position where it would not contact the lug 49.

The above explanation of the prior art has been given so that the advantages of the present invention may be more readily understood. It will be apparent that a considerable number of detachable parts, which may easily become lost, were required to obtain complete flexibility of crossfooter operation, as well as a number of non-detachable parts. In the present invention only one element is required for neutralizing one or the other or both crossfooters, and that one element remains fixed to the machine, or at least fixed to the column register.

In Figures 3, 4 and 5 it will be seen that a member in the form of a block 65 is secured to the L-shaped support 46. The block is provided with a pair of threaded openings 66 and the support is provided with two pairs of holes 67 and 68. Screws 69 are employed to secure the block 65 to the support in either of two positions, for a reason to be presently explained.

The block 65 is provided with a pair of slots within which are pivotally mounted, upon a rod 70, a pair of pick-up mechanism actuator dogs 71 and 72. Each dog is provided with a protrusion 73 having a pair of oppositely sloped surfaces, and one arm 74 of a two-armed leaf spring 75 secured to the block 65 bears against each protrusion. Thus, with the dog 71 in the active position shown in the drawing, an arm 74 bears against one of the sloped surfaces of the protrusion 73 to detent the dog in that position. When the dog 71 is manually moved to the position in which the dog 72 is shown, the arm of the spring bears against the oppositely sloped surface to detent the dog in that position. With the dog 71 in the down position, it will intercept the dog 38 of the right crossfooter pick-up mechanism, as indicated in Figure 2 and with the dog 71 in the up position the right crossfooter will not be operated. The dog 72, of course, controls the left crossfooter.

Thus it will be seen that by merely flipping the dogs 71 and 72 up or down, either or both crossfooters may be operated or not, as desired. A great saving of parts is obtained, as above pointed out, and there are no detachable parts, which are apt to be lost.

It is sometimes desirable to use a column register with a machine having a crossfooter of greater capacity than the column register. If it is desired to use the register shown in the drawing with a crossfooter having a capacity of one more denomination than the register, it is merely necessary to remove the screws 69 and move the block 65 over into alignment with the holes 67, the holes 67 being offset one letter space from the holes 68 for this purpose. In this position, the active dog 71 or 72 will be contacted by the corresponding pick-up dog 38 or 44 two letter spaces before the master wheel 16 reaches the register wheels 15 and accordingly will move the crossfooter master wheel 22 to the denominational order corresponding to the highest denomination of the register before the entry of the first digit.

Having thus described the invention, what is claimed is:

1. In an accounting machine having a column register, a pair of cross computing registers, pick-up mechanisms for relatively shifting accumulator mechanism and actuator mechanism of the cross computing registers to correspond with the relative shifting of accumulator mechanism and actuator mechanism of the column register; the improvement comprising a member attached to a column register, a pair of slots in said member, a pick-up mechanism actuator dog pivotally mounted in each of said slots, a protrusion on each of said dogs, a leaf spring attached to said member, said spring having a pair of arms one of said arms bearing against the protrusion on one of said dogs and the other arm bearing against the protrusion on the other of said dogs, said pro-

trusions each having a pair of oppositely sloped surfaces, whereby said dogs may be individually pivotally moved between a pick-up mechanism intercepting position and a non-intercepting position and will be detented in both positions by the cooperation of an arm of said leaf spring with one of said sloped surfaces.

2. In an accounting machine having a column register, a pair of cross computing registers, pick-up mechanisms for relatively shifting accumulator mechanism and actuator mechanism of the cross computing registers to correspond with the relative shifting of accumulator mechanism and actuator mechanism of the column register; the improvement comprising a support attached to the column register, a block attached to said support, means for attaching said block to said support in a plurality of positions, a pair of slots

in said block, a pick-up mechanism actuator dog pivotally mounted in each of said slots, a protrusion on each of said dogs, a leaf spring attached to said block, said spring having a pair of arms one of said arms bearing against the protrusion on one of said dogs and the other arm bearing against the protrusion on the other of said dogs, said protrusions each having a pair of oppositely sloped surfaces, whereby said dogs may be individually pivotally moved between a pick-up mechanism intercepting position and a non-intercepting position and will be detented in both positions by the cooperation of an arm of said leaf spring with one of said sloped surfaces.

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No references cited.