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CALCULATING MACHINE KEYBOARD

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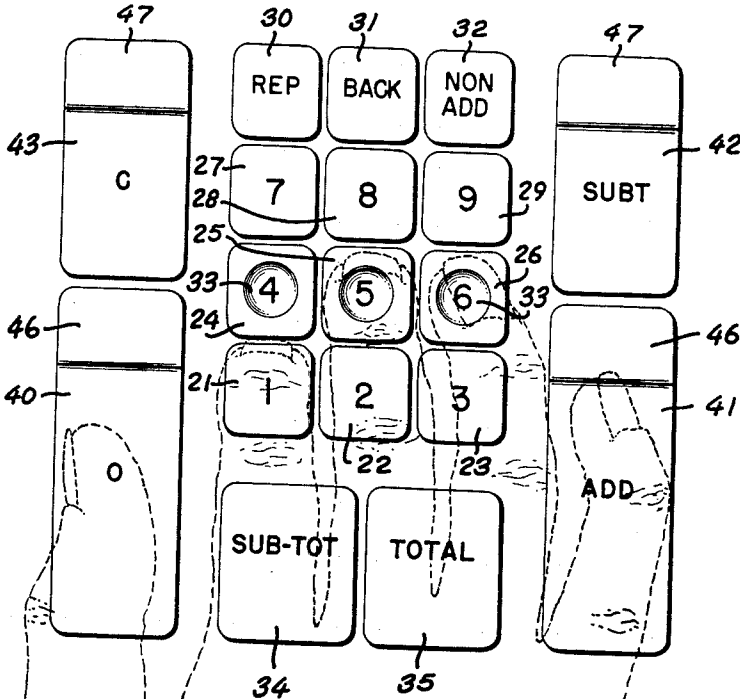


FIG. 1

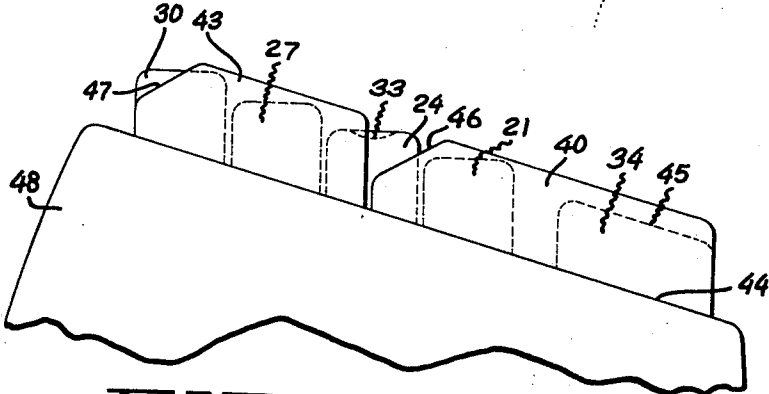


FIG. 2

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CALCULATING MACHINE KEYBOARD

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6 Claims. (Cl. 235—145)

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This invention relates to a calculating machine and more particularly to an improved arrangement of a ten-key keyboard thereof.

An object of the present invention is to provide an improved arrangement of the numeral keys and the control keys of a ten-key adding or calculating machine, whereby the operator may control the machine without viewing the keyboard.

Another object of the present invention is to provide a keyboard arrangement, whereby the operator may control the adding or calculating machine more easily with one hand.

Another object of the present invention is to arrange a keyboard in such a manner that each of the numeral keys and control keys lie within the scope of an average hand. Thus, it is unnecessary to maneuver the fingers unnaturally to depress a particular key.

Another object of the present invention is to arrange the control keys of a ten-key keyboard so that they are in close proximity to the numeral key unit. This arrangement makes it unnecessary for an operator with a small hand to lift his hand from the keyboard to reach a control key.

A further object of the present invention is to provide a keyboard in an adding or calculating machine disposed in an angular plane with respect to the horizontal thereby eliminating a large part of the muscular effort required to support the hand above the keyboard.

The ten-key keyboards of adding and calculating machines have the distinct advantage of faster operation over multiple order keyboards. However, there are mechanical advantages such as the many automatic features which are more easily incorporated into machines with multiple order keyboards. These automatic functions in difficult calculations more than compensate for the faster operation of the ten-key machines in addition and subtraction. In these simple computations, nevertheless, the ten-key machine has been very useful and is easier to operate. In view of this, my arrangement of the numeral keys and control keys for a ten-day keyboard makes it possible to speed up the operation of the machine.

Although ten-key adding machines have been in use for many years, there has been an utter disregard in arranging the keys for the convenience of the operator. My invention has accomplished this, thereby making it possible for the operator to use the "touch" system, i. e., to control the machine without lifting his hand from the keyboard and without the necessity of viewing the keyboard during operation thereof. By

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this means the operator need not take his eyes off of the ledger or paper from which the figures are being taken for entry into the machine. Thus, he is able to enter the values as fast as the machine can mechanically receive them.

My invention will now be described in connection with the drawings in which:

Fig. 1 is a plan view of the keyboard showing the hand in phantom line position for normal operation of the keyboard.

Fig. 2 is an elevational view of the keyboard.

In my arrangement of the keyboard I have placed the value keys "1" to "9" in three horizontal rows of three keys each. The three said rows being disposed in a stepped manner from the front to the rear of the machine 43 (Fig. 2), and the leading edge of each of the three said rows being above and in a plane parallel to the top 44 of the machine 43. In the first horizontal row or that row nearest the operator, as seen in Fig. 1, are the value keys 21, 22 and 23. Adjacent to and stepped above the first row is a second row of keys 24, 25 and 26. The third row of keys 27, 28 and 29 is contiguous with and stepped above the second row of keys. Each value key top is in a horizontal plane conformable to the arching of the fingers of the operator's hand. With the key top in this plane the pressure required to depress the key is lessened.

Each of the numeral keys 21 to 29, inclusive, 30 is substantially square in shape and of sufficient size to eliminate possibility of an operator depressing more than one key at a time. This misoperation is averted still further by arranging the rows of keys in steps, thereby making it necessary for the operator to rock that finger to be used for a particular value sufficiently far enough, up or down the bank of keys, to depress the desired value.

Each key in the row comprising the "4," "5" and "6" value keys 24, 25 and 26 (Fig. 1) has a concavity in its top surface as at 33. This row of keys is essentially located in the center of the keyboard and all operations of the machine are easily controlled from this focal area. The concavities in the tops of these keys make it very simple for an operator to quickly ascertain this focal position without once glancing at the keyboard. Upon depression of the "1" key with the index finger of the right hand as shown in phantom in Fig. 1 the operator may easily and quickly locate the "4" key or focal position by "touch." The same is true with the two other fingers used for the numeral keys "2," "5," and "8" or "3," "6," and "9."

Disposed immediately above or to the rear of

the keyboard are the "repeat" key 30, the "back space" key 31, and the "non add" key 32 (Fig. 1). These three keys are arranged in a stepped manner with respect to the numeral keys and form the fourth row of keys. Each of these three keys is substantially of the same size and shape as the numeral keys thereby lending symmetry to the plan of the keyboard. To use any one of these control keys 30, 31, or 32, the operator has but to rock his hand rearwardly on the keyboard to effect a depression of the desired key. The other two fingers remain in "touch" with their respective keys "4" and "5," "5" and "6," or "4" and "6."

Longitudinally disposed in close proximity to, and extending below the numeral keys is the "0" key 40. The extended portion of the "0" key below the value keys is sufficient to underlie the thumb of a large right hand in a normally relaxed position so that the only effort required is the depression of the key. This easy control of the "0" key 40 of my invention is very important as the ten-key keyboard machines, with which I am familiar, position the "0" key to the front of the keyboard making it necessary for the operator to lift his fingers from the value keys to depress the said "0" key. The key 40 extends to the rear of the keyboard sufficiently far enough to underlie the thumb of a small hand.

The "add" key 41 is comparable in size and arrangement to the "0" key and displaced to the right of and parallel with the numeral keys as viewed in Fig. 1. With the right hand in a relaxed position on the keyboard the little finger rests normally on the "add" key so that the key is easily controlled by simply rolling the hand to the right as viewed in Fig. 1. This is accomplished satisfactorily without the necessity of raising the fingers from the value keys.

Endwise adjacent the "add" key 41 is the "subtract" key 42 disposed to the right of and parallel to the value keys of the keyboard. For a subtract operation the operator need only lift the third finger of his right hand and, without disturbing the other fingers, extend it to depress the subtract key 42.

To the left of the keyboard and aligned with the "0" key 40 is the "correction" key 43. This key 43 is similar in appearance to the "subtract" key 42 and likewise is easily and quickly controlled. The operator has but to move the index finger of his right hand, from its normally inactive position on the "4" key 24, to the left where it becomes effective to initiate a "correction" cycle.

Below the value keys or to the front of the machine is the "subtotal" key 34 and "total" key 35. These control keys are adjacent each other and spaced equidistantly from the numeral key unit and the control keys 40 and 41. The two control keys 34 and 35 are so arranged so as to be easily and quickly accessible to the thumb and little finger respectively of the right hand. Because of the close proximity of the keys 34, 35 with the "1" to "9" value keys it is never necessary for the operator to lose "touch" with the keys 24, 25, and 26. The tops of these keys 34, 35 are inclined in a plane parallel to the top 44 of the machine as seen at 45 in Fig. 2. To expedite a "subtotal" operation the operator merely slides his thumb from the "0" key onto the "subtotal" key 34. Likewise, for a "total" registration his little finger is moved inwardly and onto the "total" key 35.

With the exception of the numeral keys "1" to "9" in a ten-key keyboard, the "0" key and

"add" key are those most generally used. The arrangement of these, with respect to the numeral keys, is such, that their inclined surfaces underlie the natural position of the thumb and little finger when operating the machine. This feature eliminates most of the fatigue which is apparent in an operator of a ten-key machine at the end of the day. Each of the keys 40 and 41 in my arrangement approximate the control keys 43 and 42, respectively, whereby an operator could conceivably depress two control keys simultaneously in using the "touch" system: I have eliminated this possibility by chamfering that end of each key 40 and 41 as at 46 (Fig. 2) where it approaches the respective keys 43 and 42, thereby permitting sufficient depression of keys 43 or 42 without simultaneous depression of keys 40 or 41. As seen at 47 (Fig. 2), the control keys 43 and 42 are likewise chamfered for conformity with their adjacent keys 40 and 41.

In addition to the easy accessibility of all of the keys which make the "touch" system of operation possible in my invention, the arrangement of the keys also affords a rectilinear and symmetrical appearance to the ten-key keyboard.

It is readily apparent that this keyboard arrangement is adaptable to a left-handed as well as a right-handed operator. It will also be obvious that the "add" and "subtract" keys may be placed on the left side of the keyboard and the "0" and "correction" keys on the right side without departing from the spirit of my invention.

I claim:

1. A keyboard for a ten-key calculating machine comprising selection keys arranged in three transverse rows, a row for each of three said selection keys, the value indicating faces of each of said rows of selection keys lying in a horizontal plane and in stepped relation to each adjacent row, an elongated key to the left of and extending forwardly of the selection keys, a second elongated key to the right of and extending forwardly of the selection keys, each of said elongated keys having a surface angularly disposed to the plane of the value indicating faces of said rows of keys, one of said elongated keys being a "0" key and the other the most commonly used control key, a control key aligned with the first said elongated key, a second control key aligned with the said second elongated key, and a relieved portion of each of said elongated keys forming an indenture between said elongated keys and said aligned control keys for enabling depression of either of said control keys to the exclusion of the aligned elongated keys during a rapid operation of the said keyboard.

2. A keyboard for a ten-key calculating machine comprising a single key for each value of from "1" to "9", inclusive, a row for each of three said single keys, a square unit comprised of three said rows of three keys, each of three said keys in two of said rows having a smooth top, a middle row of three said rows of three keys adapted to form a focal row of keys, a concavity in the top of each of said keys in said middle row for sensing said focal row by touch, and an extended "0" key parallel to said unit.

3. A keyboard for a ten-key calculating machine comprising a single key for each value of from "1" to "9", inclusive, three transverse rows of three keys each, a smooth top for a plurality of said keys, an identifying top surface for one or more of said keys forming a configuration on said keyboard for discernment of each of said three rows by touch, a middle row of three said

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rows, a "0" key disposed to one side and forwardly of the said middle row of keys and an "add" key disposed to the other side and forwardly of said middle row of keys.

4. A calculating machine having a ten-key selection mechanism, a unit of nine value keys of said selection mechanism, a center row of three keys thereof, a means for locating said center row by touch, a "0" key longitudinally disposed to the left of and extending below said unit of keys for control by the right-hand thumb during digitation, and control means comprised of an "add" key longitudinally disposed to the right of and extending below the said unit of keys for control by the little finger of the right hand, a "subtract" key adjacently aligned with said "add" key for control by the third finger of the right hand, a "correction" key adjacent and aligned with the said "0" key for control by the index finger of the right hand, a "subtotal" key to the right of the lower end of the said "0" key and below the said unit of keys, and a "total" key disposed to the left of the lower end of the "add" key and below the said unit of keys to complete a rectangular unit.

5. A keyboard for a ten-key calculating machine comprising selection keys arranged in three transverse rows, an elongated key to the left of and extending forwardly of the selection keys, a second elongated key to the right of and extending forwardly of the selection keys, one of said elongated keys being a "0" key and the other an add key, and a total key and a subtotal key in front of said selection keys and between the forward ends of the elongated keys.

6. A keyboard for a ten-key calculating machine

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comprising a single key for each value of from "1" to "9," inclusive, arranged in three transverse rows of three keys each, recessed tops for said keys in the second row of the three said rows adapted to form a focal row, smooth tops for said keys in the first and third row of the three said rows for enabling identification of said focal row by touch, a longitudinally extending "0" key lying to the left of and extending forwardly of the left-hand numeral key of the second row of keys, said "0" key being of such length and so spaced from the left-hand numeral key as to underlie the thumb of the right hand of the operator while the forefinger thereof is in contact with the left-hand numeral key, and a longitudinally extending control key lying to the right of and extending forwardly of the right-hand numeral key of the second row of keys, said control key being of such length and so spaced from the right-hand numeral key as to underlie the little finger of the right hand of the operator while the third finger thereof is in contact with the right-hand numeral key.

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