Sept. 16, 1958 P. D. WILLIAMSON 2,851,945

TYPE STRIKING PLATEN OPERATING MEANS FOR VISIBLE PRINTING CALCULATING MACHINES

Filed Jan. 28, 1957 6 Sheets-Sheet 1

FIG 2

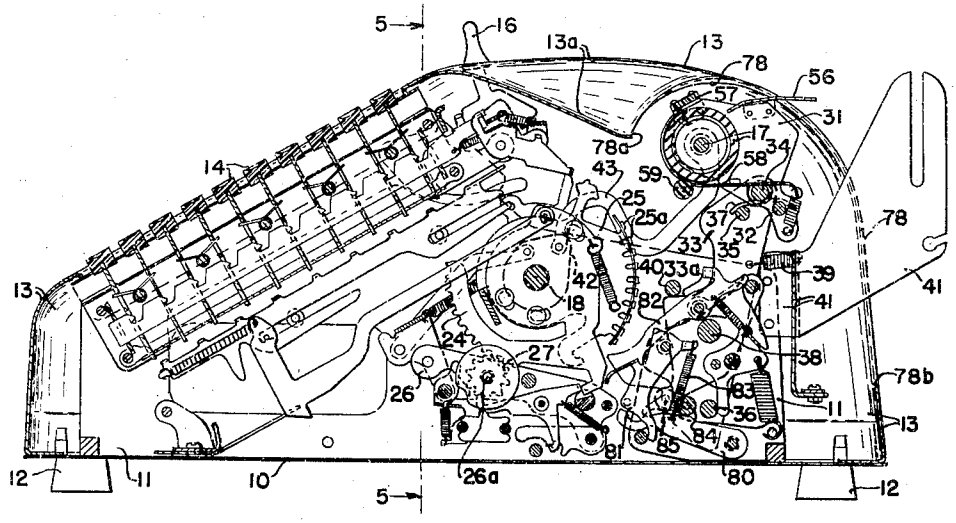
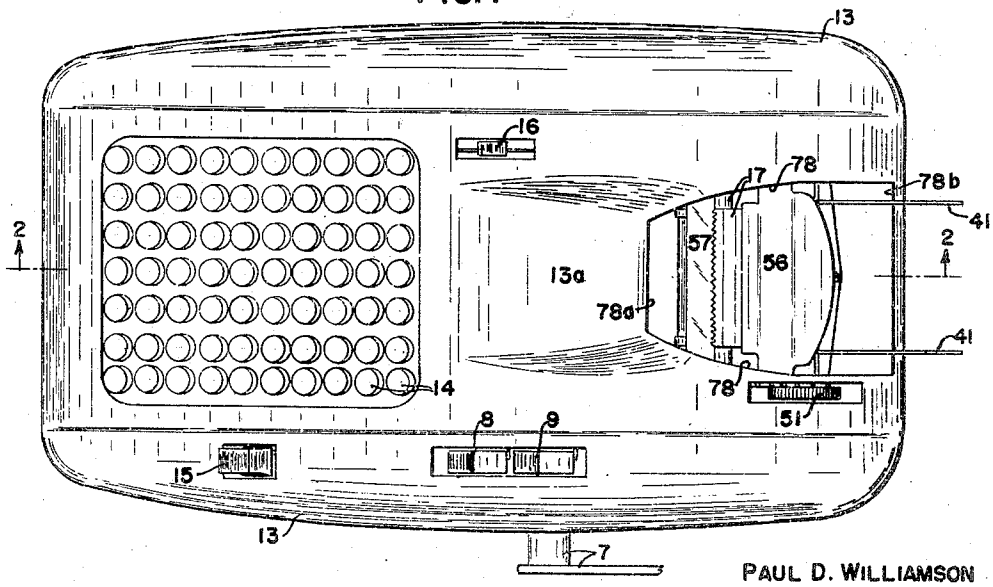


FIG. 1



PAUL D. WILLIAMSON
INVENTOR

BY Theodore C. Simonton
ATTORNEY

Sept. 16, 1958 P. D. WILLIAMSON 2,851,945

TYPE STRIKING PLATEN OPERATING MEANS FOR VISIBLE PRINTING CALCULATING MACHINES

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FIG. 3

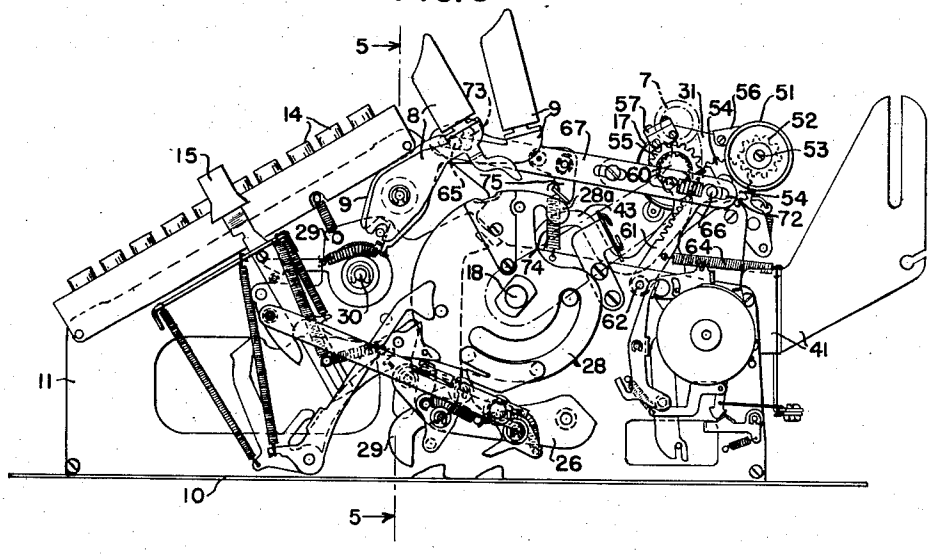
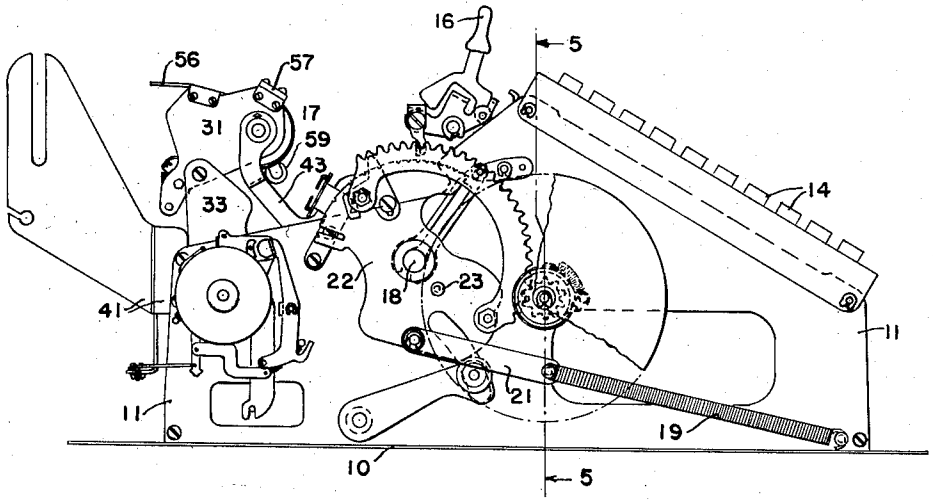


FIG. 4



PAUL D. WILLIAMSON
INVENTOR

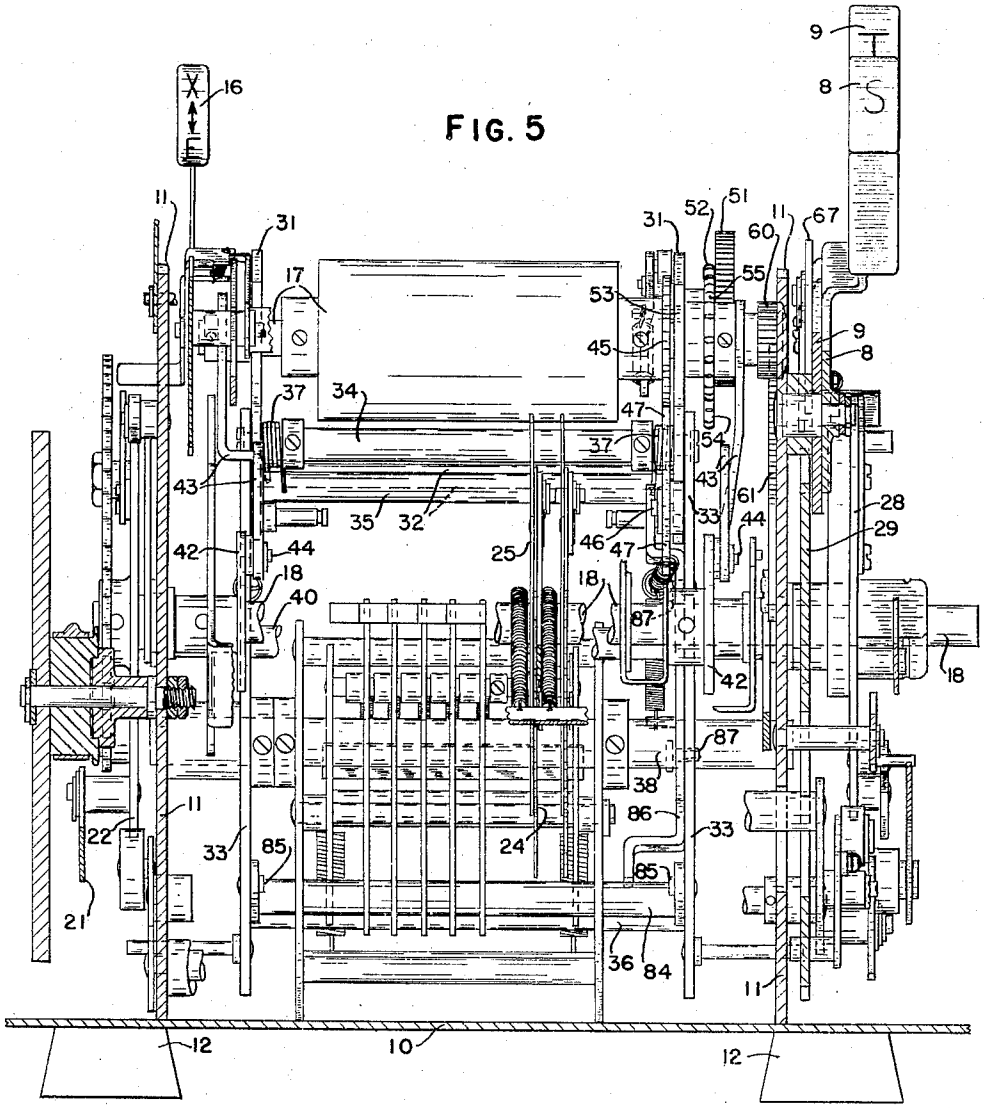
BY Theodore L. Simonton
ATTORNEY

Sept. 16, 1958 P. D. WILLIAMSON 2,851,945

TYPE STRIKING PLATEN OPERATING MEANS FOR VISIBLE PRINTING CALCULATING MACHINES

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FIG. 5



PAUL D. WILLIAMSON
INVENTOR

BY Theodore E. Simonton
ATTORNEY

Sept. 16, 1958 P. D. WILLIAMSON 2,851,945

TYPE STRIKING PLATEN OPERATING MEANS FOR VISIBLE PRINTING CALCULATING MACHINES

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FIG. 6

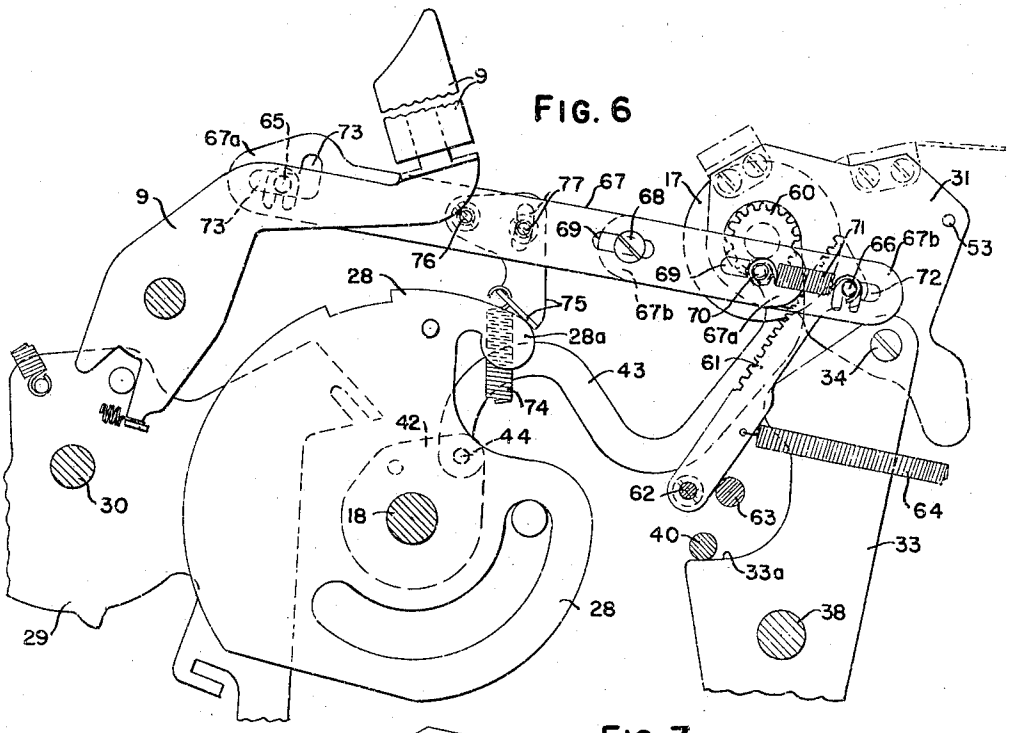
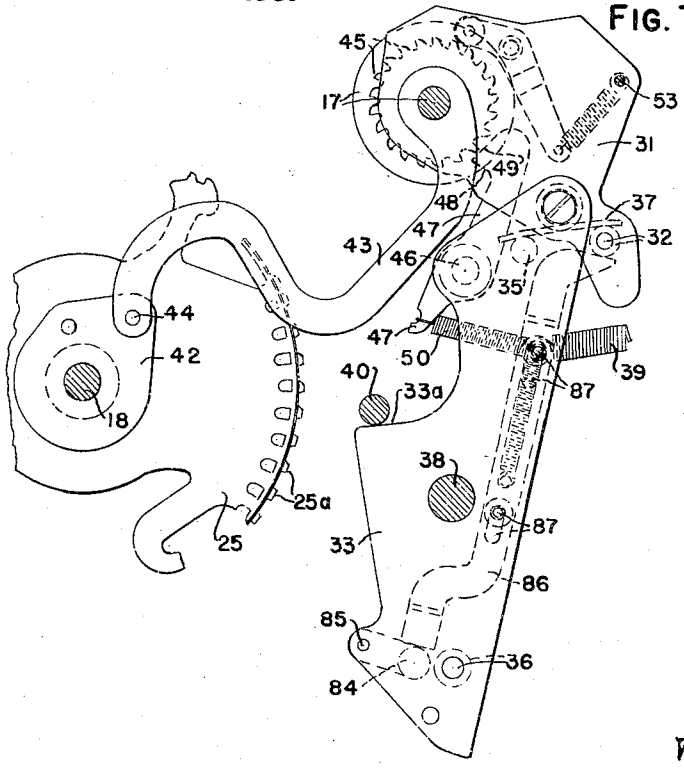


FIG. 7



PAUL D. WILLIAMSON
INVENTOR

BY Theodore C. Simonton
ATTORNEY

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TYPE STRIKING PLATEN OPERATING MEANS FOR VISIBLE PRINTING CALCULATING MACHINES

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FIG. 8

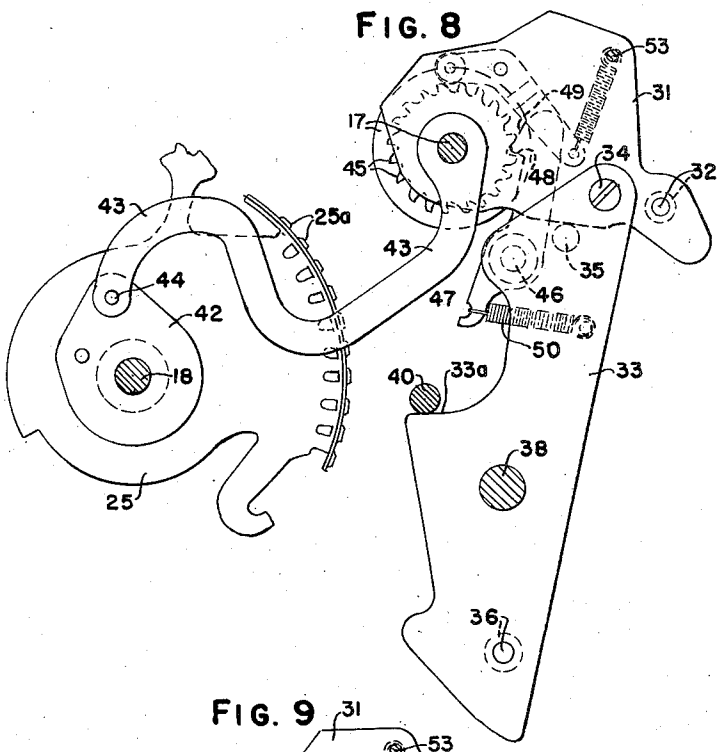
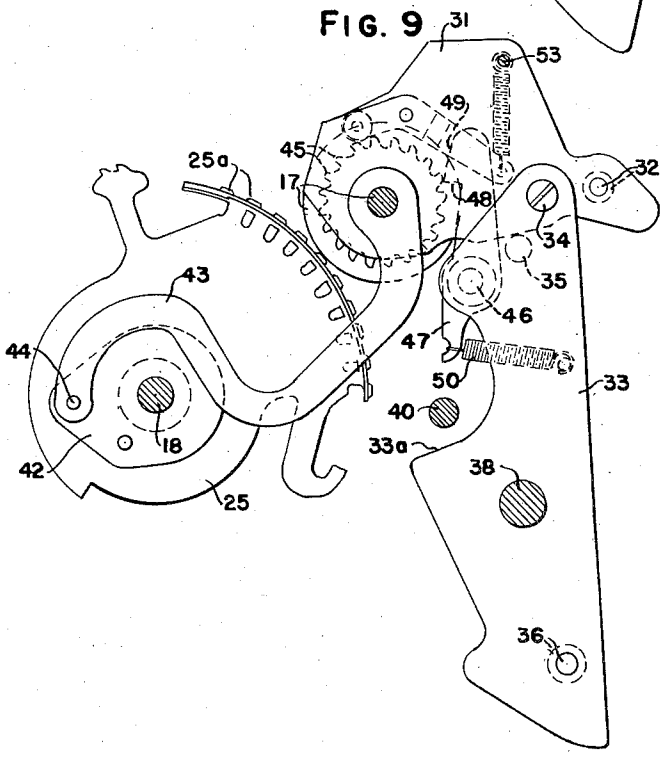


FIG. 9



PAUL D. WILLIAMSON
INVENTOR

BY Theodore E. Simonton
ATTORNEY

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TYPE STRIKING PLATEN OPERATING MEANS FOR VISIBLE PRINTING CALCULATING MACHINES

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FIG. 10

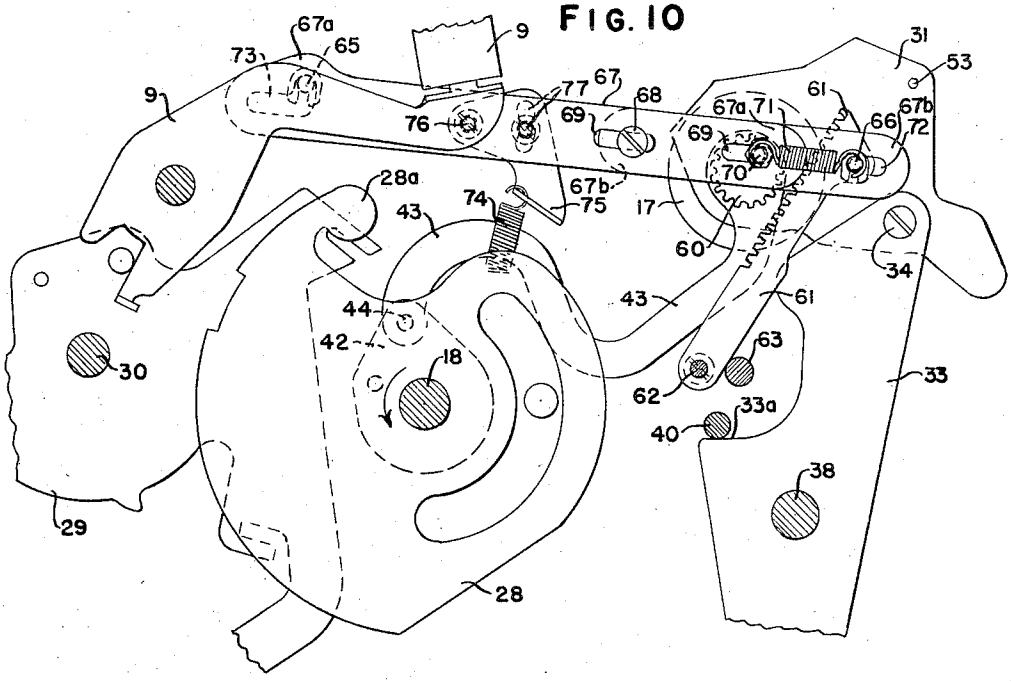
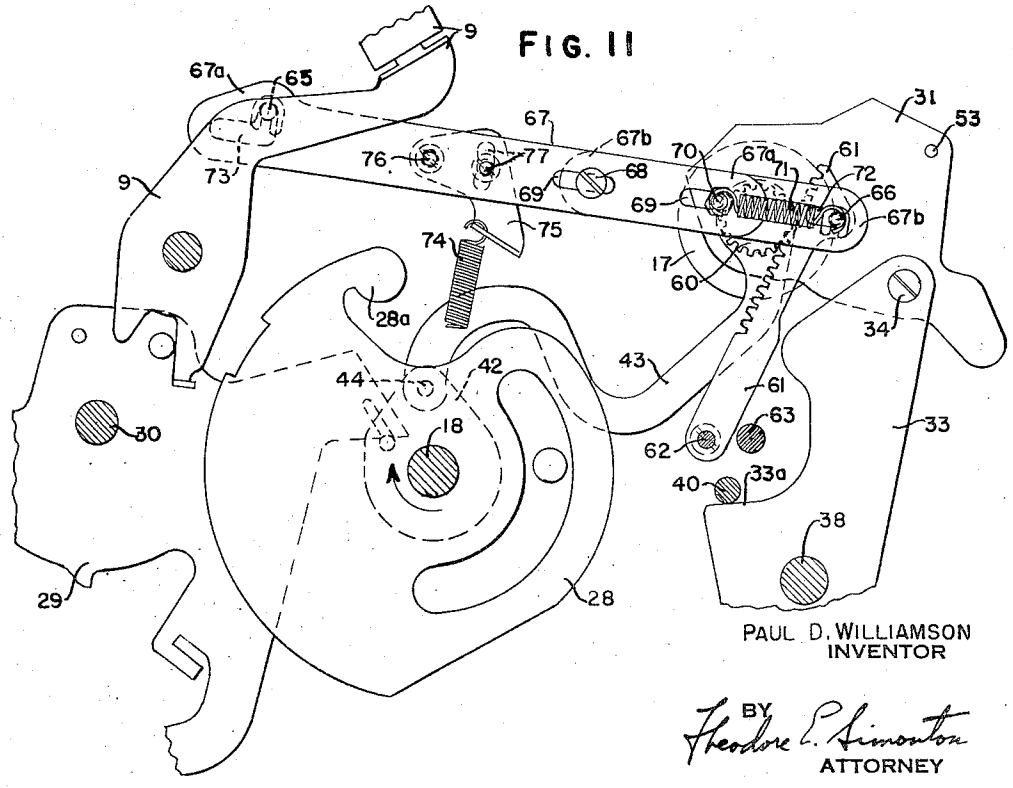


FIG. 11



PAUL D. WILLIAMSON
INVENTOR

BY Theodore C. Simonton
ATTORNEY

United States Patent Office 2,851,945 Patented Sept. 16, 1958

2,851,945

TYPE STRIKING PLATEN OPERATING MEANS FOR VISIBLE PRINTING CALCULATING MACHINES

Paul D. Williamson, Moravia, N. Y., assignor to Smith-Corona Inc., Syracuse, N. Y., a corporation of New York

Application January 28, 1957, Serial No. 636,635

15 Claims. (Cl. 101—93)

The invention relates to improvements in type striking platen operating means for visible printing calculating machines.

Visible printing calculating machines are well known which have a platen roller which is rotative to line space a record tape and which is actuative from a normal rest position to print items, sub-totals, grand totals, etc., by forcing the tape against type which have been aligned in a row at a printing line by differential movement of a row of type carriers. Such machines have been characterized, however, by poor or limited visibility of the digits of the last number printed on the tape.

The invention has for its principal objects the provision of platen operating means for such machines whereby clear visibility of the last number recorded on the tape is attained, the provision of improved means for rotatively line spacing the platen in listing items, the provision of a sweep line spacing of the platen after printing a grand total, and the provision of a compact operating means for effecting type striking and line spacing movements of the platen.

Other objects and advantages of the invention will appear from the following description of the invention as embodied in its preferred form and illustrated in the accompanying drawings, wherein the invention is shown incorporated in the well known "Smith-Corona" visible printing calculating machine.

In the drawings:

Figure 1 is a plan view of the known calculating machine with the improvements incorporated therein;

Figure 2 is a longitudinal sectional view of the improved machine on the line 2—2 of Figure 1;

Figure 3 is a right hand side elevation of the machine with its casing removed;

Figure 4 is a left hand side elevation of the machine with its casing removed;

Figure 5 is a transverse sectional view on an enlarged scale substantially on the line 5—5 of Figures 2, 3 and 4, with certain parts omitted;

Figures 6 and 7 are fragmentary side elevational views on an enlarged scale and similar respectively to Figures 3 and 2, the parts in these and the preceding views being shown in their rest positions;

Figure 8 is a view similar to Figure 7 showing the parts as positioned at the end of the first or platen-lowering portion of a forward stroke of the operating handle of the machine;

Figure 9 is a view similar to Figure 7 showing the parts as positioned in printing position at the end of a forward stroke of the handle;

Figure 10 is a view similar to Figure 6 showing the parts as positioned at the end of the first or platen-lowering portion of a forward stroke of the handle during the taking of a final or grand total; and

Figure 11 is a view similar to Figure 6 showing the parts as positioned at the commencement of the final platen-raising portion of a return stroke of the handle after a final or grand total has been printed.

Since the construction and mode of operation of the known key-set calculating machine in which the improvements are shown incorporated are well known, and since the improvements may be embodied in other machines, only so much of the known machine as is necessary to an understanding of the present invention will be described, reference being made to the following patents for showing and description of known features of the machine:

1,784,862—Barrett
1,811,840—Barrett
1,812,129—Barrett
1,812,130—Barrett
1,812,161—Mapel
1,925,089—Barrett
1,949,445—Barrett
1,949,446—Barrett
1,951,592—Barrett

So much of the known machine as is necessary for an understanding of the improvements now will be described. Said machine has a main frame comprising a base plate **10** and left and right hand side plates **11** mounted on the base plate which is provided with supporting feet **12**. A removable cover or casing **13** having an open bottom is seated on the base plate and houses substantially all of the working parts of the machine. The keyboard of the machine comprises fore and aft extending denominational columns of digit keys **14** selectively settable to set up numbers to be added and listed, to be listed without adding under control of a non-add key **15**, or to multiplied by repeated addition under control of a repeat key **16**. The keyboard inclines upward and rearward and is located at the forward portion of the machine. Spaced rearwardly from the upper rear end of the keyboard and normally in the rear portion of the machine is a platen roller **17**.

The machine has an oscillative main operating shaft **18** journalled in the side plates and extending horizontally across the machine at a level lower than the platen and the rear end of the keyboard in a zone about midway between the front and rear of the machine and located downwardly and rearwardly of the rear end of the keyboard and forwardly and downwardly from the platen roller. This shaft is rotative first counterclockwise, as viewed in Figure 2, from a rest position and then clockwise back to the rest position on each operation of the machine by a forward and return stroke respectively of a crank handle **7** attached to the right hand end of the shaft exteriorly of casing **13**. To assist in returning the handle and main shaft a spring **19** is anchored to the left hand side plate at **20** and to the forward end of a link **21**, the rear end of said link being pivoted to a sector **22** which is fixed on the left hand end of the shaft. Sector **22** carries a stud **23** to engage the upper edge of the link after an initial part of the forward stroke of the handle for augmenting the rate of stretching of the spring during the remainder of the forward handle stroke by causing the link to revolve as a unit with the sector.

The main shaft supports a denominational set of adding racks or sectors **24** and a connected denominational set of type segments **25**. Each adding sector **24** and its connected type segment is independently and variably oscillative from and to a rest position and moves counter-clockwise as viewed in Figure 2 on the forward handle stroke to position the type segments for printing an item, sub-total or final total in the known manner. Each type segment bears a set of digit types "0" to "9" designated **25a** and all normally below the printing line of the machine. Supported in a rocking totalizer frame **26** on a rod **26a** of the frame is the usual totalizer comprising a denominational set of individually rotative accumulator pinions **27**, one for each adding sector, which are meshed with, and demeshed from

the adding sectors in timed relation to the handle strokes by rocking of the totalizer frame in known manner under control of known cam means including a main cam 28 fixed on the main shaft and a second cam 29 rockable on a pivot 30 on the main frame of the machine to effect adding, non-adding and repeat adding, and the taking of sub-totals and final totals. The type segments are positioned to print the number set up in the keyboard, except in total and sub-total taking operations in which they are positioned to print the amount accumulated in the totalizer. The known machine has a sub-total key 8 and a total key 9.

The known machine afforded a very compact key-set calculator of low height and rather short fore-and-aft length but due to the low printing line resultant from its compact construction it afforded a poor or limited visibility of the last number listed on the record tape fed about the platen roller. The present invention relates primarily to improved means for mounting and swinging the platen roller to effect printing at the aforesaid low printing line and for line spacing the platen after printing an item, a sub-total and a final total, all to the end of affording clear visibility of the last number listed or printed on the tape and to afford a sweep line space rotation of the platen after printing a final total. In conjunction with the aforesaid improved means the casing or cover also has been improved to more completely encase the working parts of the machine and yet afford excellent visibility of the last number printed on the record tape. It will be noted that the improvements made accomplish the ends sought without increasing the over-all height of the machine as will be apparent from a comparison of the drawings of the improved machine with those of the aforementioned Barrett Patent 1,811,840, for example.

The improvements now will be described in detail.

The platen roller 17 of the improved machine has its axis located in the same vertical transverse plane of the machine as that of the axis of the platen roller of the known machine but at a substantially higher level. However the highest point of the platen roller still is slightly lower than the highest point of the keyboard so that the over-all height of the improved machine is not increased by this higher location of the platen roller. The printing line of both the known and improved machines being at the same low level, the following novel means are provided in the improved machine for supporting the platen roller for pressing it to the types on the type segments arrayed along the printing line, for rotatively line spacing the platen roller after printing, and for restoring the platen roller to a rest position in which the last number printed on the record tape is clearly visible to an operator seated at the front of the machine.

The shaft of the platen roller is journalled in the forward ends of a pair of side plates 31 of the upper section of a knuckle-jointed platen supporting frame. Said section of the platen supporting frame also includes a tie rod 32 connecting the side plates 31 adjacent their rear ends. The side plates 31 of the upper frame section abut the inner faces of the upper end portions of a pair of normally upstanding side plates 33 of the lower section of the supporting frame and are hinged thereto by a pivot shaft 34 which is connected to the upper ends of side plates 33 and extends through side plates 31 intermediate the platen roller and the rear ends of plates 31 and forward of tie rod 32. The lower section of the platen supporting frame also includes tie rods 35 and 36 respectively connecting side plates 33 adjacent the upper and lower ends of said side plates. The tie rod 35 is spaced downwardly and forwardly of pivot shaft 34, in the normal position of the frame sections. In their rest position, the side plates 31 of the upper frame section have their lower edges spaced above tie rod 35 and extend upwardly and forwardly from pivot shaft 34 to support the platen roller forwardly of the pivot shaft 34 with the entire platen roller located above the level of the pivot shaft 34. Preferably a pair of torsion springs 37 are wound about pivot shaft 34 with their opposite ends engaged with tie rods 32 and 35 of the upper and lower frame sections to constantly urge the upper section in platen raising direction. The lower frame section has its side plates 33 journalled on a pivot shaft 38 mounted in the side plates 10 of the main frame of the machine in the same position as the pivot shaft for the non-jointed supporting frame for the platen roller of the known machine, said position being in the rear portion of the machine and under the normal position of the platen roller at a level lower than that of the main operating shaft 18. Preferably the forward ends of a pair of springs 39 are anchored to the side plates 33 of the lower frame section above pivot shaft 38 to yieldingly resist forward rocking of said frame section from a normal position in which an upwardly facing stop edge 33a of each side plate is engaged under a combined stop and tie rod 40 fixed to the main frame side plates 10. The rear ends of springs 39 are anchored to the supporting bracket 41 for the spindle of the usual record tape roll, which bracket is anchored to the main frame side plates 11. Springs 39 also assist in returning the platen supporting frame to normal position.

The jointed supporting frame for the platen is operated by means of a pair of kinematically identical toggles spaced apart transversely of the machine and each comprising a toggle arm 42, a toggle link 43 and a toggle hinge or pivot pin 44 connecting the toggle arm and toggle link at the forward end of the link. The toggle arms 42 are fixed to the main operating shaft 18 of the machine, and the toggle links 43 are pivotally anchored to the shaft of the platen roller outside of the side plates 31 of the upper section of the platen supporting frame.

The toggles, in rest position, are substantially fully extended with their hinge pins 44 slightly above a plane containing the axes of the main shaft and the platen roller shaft. On each operation of the machine the operating handle 7 is stroked forwardly of the machine and restored to rest position by a reverse rearward stroke thereby rotating the main shaft 17 counter-clockwise as viewed in Figure 2 through a part of a revolution and clockwise back to rest position on the forward and rearward strokes of the handle, the extent of motion of the shaft and handle being limited by known means. At the end of a forward stroke of the handle the toggles are substantially fully folded with their hinge pins forward of the main shaft and slightly above the plane containing the axes of the main shaft 18 and of the platen roller when the platen roller is engaged with the type segments at the printing line of the machine, as shown in Figure 9. It will be noted that the platen roller engages the types at the printing line directly between the main shaft and the platen roller shaft.

The construction and arrangement of the jointed platen supporting frame and its pair of operating toggles are such that the toggles operate the frame with an accelerating-decelerating motion on each handle stroke for ease of handle operation, minimum noise and shock, and for powerful pressure of the platen roller against the types. The construction and arrangement of the parts also is such that, on a full forward stroke of the handle 7, the toggles act first solely to lower or fold downwardly the upper section of the jointed supporting frame of the platen roller into abutting relation with the tie rod 35 of the lower section of said frame, as shown in Figure 8, and thereafter act to swing the folded frame as a unit until the platen roller is pressed to those types of the type segments which are arranged at the low printing line of the machine, as shown in Figure 9, it being understood that the usual inked ribbon (not shown) is interposed between these types and the record tape fed over the platen roller. On a full return or reverse rearward stroke of the handle, the toggles first rock the

folded platen roller supporting frame as a unit until its lower section is back to its normal position, then unfold the folded frame, being aided in so doing by springs 37 and 39. The extent of unfolding of the frame is limited by the toggles.

The following novel means are provided whereby actuation of the jointed platen supporting frame in the above described manner by a forward and a rearward stroke of handle 7 will automatically rotate the platen roller to advance the record tape a single line space for spacing successive amounts or items recorded on the tape. A line space ratchet wheel 45 is fixed to the shaft of the platen roller shaft at the inner face of the right hand side plate 31 of the upper section of the platen supporting frame. Pivoted at 46 on the right hand side plate 33 of the lower section of said frame and located in the plane of the ratchet wheel is a line space pawl 47 having at its upper end a tooth having a downwardly facing edge 48 and an upwardly and rearwardly inclined front edge 49, as shown in Figures 7, 8 and 9. A spring 50 connected to the lower end of the pawl 47 and the adjacent side plate of the lower frame section normally holds edge 49 of the pawl tooth abutted against the ends of adjacent teeth of the ratchet wheel to hold the pawl tooth from entering tooth spaces of the ratchet wheel in the rest position of the frame and to permit free rotation of the platen roller in both directions by a finger wheel 51. Wheel 51 and an attached gear 52 are journalled on the right hand side plate 31 of the upper frame section at 53, the gear 52 meshing with a gear 54 journalled on said plate, which gear 54 meshes with a gear 55 fixed on the shaft of the platen roller.

The mode of line spacing of the platen roller by pawl 47 now will be described. On the forward stroke of the handle 7, the downward folding of the upper section of the platen supporting frame and swinging of the folded frame brings the ratchet wheel out of engagement with pawl tooth edge 49 into position in which the pawl tooth is engaged by spring 50 between two adjacent teeth of the ratchet wheel with tooth edge 48 overhanging a ratchet wheel tooth. During that part of the return stroke of the handle which unfolds the platen frame, the ratchet wheel is forced past pawl tooth edge 48 and rolled upward onto tooth edge 49 to rotate the platen roller one tooth space of the ratchet wheel in clockwise direction as viewed in Figure 9, such line spacing being entirely completed during the unfolding of the upper frame section. It will be noted therefore that it is the folding and unfolding of the frame that causes the line spacing means to operate rather than the swinging of the jointed frame as a unit toward and from the type segments.

The unfolding of the frame and the aforesaid single line space rotation of the platen roller bring the roller to a high position in the machine at which the last printed amount on the record tape is clearly visible forward of and slightly above the platen axis. The record tape is fed forward under the platen roller from a tape roll journaled in bracket 41, thence up in front of the roller and rearward over the roller and the known tape discharge table 56, passing under the known tape tear-off blade 57, said table 56, blade 57 and the known paper feed table 58 with its feed roll 59 being carried by the upper section of the platen supporting frame.

The above single line spacing of the platen roller is adequate for all operations of the machine, including the taking of a sub-total under control of the sub-total key 8, but excepting the taking of a final total under control of the total key 9 where it is desirable to impart a larger or sweep rotation to the platen roller to position the printed total on the tape slightly to the rear of tear-off blade 57 so that the printed portion of the tape with the final printed total may be severed from the remainder of the tape.

The following novel means are provided for imparting a sweep line spacing rotation to the platen roller during the taking of a final total. A sweep line spacing gear 60 is fixed on the right hand end of the shaft of the platen roller 17 in the plane of and forwardly of a sweep line spacing rack 61 which is pivoted at its lower end at 62 on the right hand side plate 11 of the main frame of the machine. Back 61 normally is held rocked rearwardly against a stop 63 on the main frame of the machine by a spring 64 anchored to the rack and to bracket 41 to maintain the rack in an idle position in which its teeth are out of engagement with those of gear 60 during all operations of the machine except the taking of a final total under control of total key 9.

Depression of the known total key 9 conditions the known cam mechanism, including cams 28 and 29, for operation to cause the machine to take and print a final total and clear the totalizer in the known manner. Operation of the total key also conditions the machine for operation of the sweep line spacing gear and rack through the means and in the manner now to be described.

Interconnecting a stud 65 on the total key 9 and a stud 66 on the upper end of rack 61 is a draw link 67 for rocking the rack forwardly into mesh with gear 60. Link 67 is preferably made in two sections 67^a and 67^b adjustably clamped together by the screw 68 and the screw-stud 70 threaded into the rearward section 67^b through appropriate slots 69 in section 67^a. The screw stud 70 is connected by a spring 71 with the rack stud 66 so as to normally hold the stud 66 engaged with the forward end of a longitudinal slot 72 in the rear link section 67^b.

The total key stud 65 is engaged in a slot 73 at the forward end of the forward link section 67^a, said slot 73 having a front portion extending longitudinally of the link and leading into the lower end of a rear upstanding portion of the slot. Total key stud 65 is normally engaged in the front longitudinally extending portion of the slot 73 as shown in Figures 3 and 6.

Upon depression of the total key, as shown in Figure 10, the stud 65 moves rearwardly in slot 73 and a spring 74 which is attached to the adjacent main frame side plate and to a cam follower 75 which is adjustably held to the front link section by a pivot 76 and a slot and clamping screw connection 77, thereupon swings the link downwardly to engage stud 65 in the upstanding portion of slot 73, thereby positively connecting the total key and draw link 67.

On the forward stroke of handle 7 in taking and printing a total the above described parts of the sweep line spacing mechanism move from their positions of Figures 3 and 6 without engagement of rack 61 with gear 60 during folding of the upper section of the platen roller supporting frame and during swinging of the folded frame bodily to printing position. On the forward handle stroke the parts move first to the position of Figure 10 after which the folded platen supporting frame swings bodily to printing position.

On the return stroke of the handle the folded platen frame moves bodily to the position of Figure 11 to restore its lower section to normal position, and the frame is unfolded to its rest position, as hereinbefore explained, during the final portion of the return stroke of the handle. As the frame moves back to the position of Figure 11 the known cam mechanism throws the depressed total key clockwise into the position shown in Figure 11 thereby causing the key to pull the link 67 forwardly and rock the rack 61 into mesh with gear 60 and hold it there until just prior to completion of the return stroke of the handle 7 so that as the frame unfolds the gear 60 is rolled up the rack 61 and rotated to rotate the platen roller through several tooth spaces of ratchet wheel 45 sufficient to advance the tape until the printed final total appears at the rear of tear-off blade 57. Just before the return stroke of the handle is completed a part 28^a of cam 28 engages and lifts cam follower 75 on link 67 to dis-

engage total key stud 65 from the upstanding portion of link slot 73 and the parts assume their position of rest with the sweep line spacing means in normally disabled condition. It will be noted that the sweep line spacing action also is caused by the unfolding of the platen supporting frame.

In the improved machine the top wall of the casing 13 extends substantially horizontally rearwardly from the rear upper edge of the keyboard to merge with the rear wall of the casing behind the platen supporting frame. The top wall has a medial depression 13^a of gradually increasing depth from its front and rear edges to a line which is slightly forward of the platen roller and located substantially at the level of the shaft of the platen roller. The casing is formed with a wide media slot 78 extending rearward over the platen roller from the deepest line of the depression 13^a at an end edge 78^a of said slot to an end edge 78^b of said slot in the rear wall of the casing below bracket 41. Except for printed final totals, the last number printed on the tape appears at the front of the platen roller slightly above the edge 78^a of slot 78 after each operation of the machine and is fully visible to an operator seated at the front of the machine. A final total printed on the tape is visible through slot 78 between the tear-off blade 57 and the tape discharge table 56, the tape being discharged over the table 56 and out rearwardly through slot 78 where it is accessible to the operator.

It will be noted that the tie rod 36 of the lower section of the platen supporting frame of the improved machine is adapted to actuate cipher eliminating mechanism such as is shown and described in the aforementioned Barrett Patent 1,951,592. The cipher eliminating mechanism of the improved machine, like that of the known machine, includes a plurality of latch pawls 80 each of which, by engagement with the projecting stud of its respective selector arm 81, is adapted to suppress the action of its respective eliminator pawl 82 in any column in which the adding sector 24 passes to the "1" adding position or beyond it. A spring 83 connects each latch pawl 80 with its respective selector arm 81 and urges the former to its engaged position and the latter to its rest position as shown in Figure 2.

The following provision is made in the improved machine for disengagement of the pawls 80 from the selector arms 81 at the end of each return stroke of the handle 7. A bail 84, best seen in Figures 2 and 5, is pivoted at 85, and extends across the lower section of the platen supporting frame. The bail 84 is adapted to contact the upper edges of the engaging latch pawls 80 and to move the pawls downward to their disengaged lowermost position. A push link 86, best seen in Figures 5 and 7, secured by stud and slot sliding connections 87 to the right hand side plate 33, provides means by which the bail 84 is swung downwards when the platen supporting frame is unfolded to its rest position. The lower end of push link 86 continuously abuts the bail 84 and the upper end thereof is adapted to contact the tie rod 32 between the side plates 31 of the upper frame section as the frame is unfolded upon approaching its rest position. As the upper frame section reaches its rest position the tie rod 32 slides the push link 86 downward, bail 84 is swung downward and the latch pawls 80 are moved downward against the action of springs 83.

Instead of the main shaft 18 being oscillated manually by handle 7, it is obvious that the shaft may be power oscillated by known means as is common in the art.

I claim:

1. A recording calculator having a set of type carriers differentially positioned at each operation of the machine to array along a printing line predetermined numeral types, a record tape feeding platen roller movable to a printing position against such arrayed types from a rest position above and to the rear of the type carriers, a knuckle-jointed and normally upstanding and extended supporting frame having a lower section rockable toward and from the type carriers about a fixed axis from and back to a normal position behind the type carriers and also having an upper section journalling the platen roller and foldable downwardly and forwardly toward the type carriers into an abutting relation with the lower frame section in which the platen roller is engageable with types on the type carriers arrayed at the printing line, and means for automatically actuating said frame at each operation of the machine to first fold the frame and then rock the folded frame to move the platen roller to printing position and for thereupon restoring the frame to said normal position and thereafter restoring the roller to said rest position, for display at the front of the platen roller of the last number printed on a record tape fed by the roller.

2. A recording calculator, as claimed in claim 1, wherein the frame actuating means is connected to the upper section of the platen roller supporting frame to, at each operation of the machine, first fold the upper frame section, then rock the folded frame as a unit toward and from the type carriers and, finally to unfold the upper frame section.

3. A recording calculator, as claimed in claim 1, wherein the means for automatically actuating the platen roller supporting frame comprises toggle means connected with the upper section of the frame axially of the platen roller and movable from a substantially fully extended rest condition to a substantially fully folded condition to move the platen roller to printing position.

4. A recording calculator, as claimed in claim 1, having means responsive to unfolding movement of the upper platen roller journalling section of the roller supporting frame to rotatively line space the roller in a direction to feed a record tape upwardly in front of the roller.

5. A recording calculator, as claimed in claim 1, having a line space ratchet wheel held to the platen roller coaxially with the roller, and a line space pawl pivoted on the lower frame section and spring urged to the teeth of the ratchet wheel for rolling of the ratchet wheel upwardly past the pawl during unfolding of the roller supporting frame to rotate the wheel and roller in a direction for feeding a record tape upwardly at the front of the roller.

6. A recording calculator, as claimed in claim 1, having a final total key operable to condition the machine for taking and printing a final total, a record tape tear-off blade mounted on the upper platen roller journalling frame section adjacent the uppermost part of the platen roller, and a normally disabled sweep line spacing means conditioned by operation of said total key to rotate the roller during unfolding of said upper frame section and to an extent to feed a record tape to present the printed total at the top of the platen in rear of said tear-off blade.

7. A recording calculator, as claimed in claim 6, wherein the sweep line spacing means comprises a gear held to the platen roller coaxially therewith, a rack pivoted in the machine to swing into and out of mesh with said gear, said rack being normally yieldingly held demeshed from the gear, means responsive to a final total taking operation of the machine to mesh said rack with said gear at the beginning of unfolding movement of the upper frame section for rolling of the gear up the rack to rotate the roller and for demeshing the rack from the gear substantially at the completion of the unfolding of the upper frame section.

8. A machine, as claimed in claim 1, having spring means connected with the frame sections to constantly urge the upper frame section upwardly, and spring means connected with the lower frame section to constantly urge it to its normal position.

9. A machine, as claimed in claim 1, having a line space ratchet fixed to and coaxial with the platen roller, and a line space pawl so mounted on the lower section

as to rotate the roller by movement of the ratchet wheel relatively to the pawl in consequence of the roller restoring movement of the upper frame section.

10. A machine, as claimed in claim 9, in which the pawl is spring urged to the ratchet wheel, has an edge for normal contact with the tops of the wheel teeth, and has a second edge against which tooth edges of the wheel are rolled by restoring movements of the upper frame section to line space the roller.

11. A machine, as claimed in claim 9, having a tape tear-off blade on the upper frame section adjacent the top of the roller, a gear fixed on the roller shaft, a rack mounted on the machine independently of the roller supporting frame for movement into and out of mesh with said gear, and means responsive to a final total taking operation of the machine to mesh said rack with said gear during restoring movement of the upper frame section following printing of a final total on a tape fed by the roller to impart a sweep line spacing rotation to the roller which feeds the tape to present the printed final total at the top of the roller in the rear of said tear-off blade.

12. A key set recording calculator of the class described having a keyboard extending upwardly and rearwardly at the front of the machine substantially to the top of the machine, a platen roller having a rest position adjacent the top and rear of the machine, a normally upstanding platen roller supporting frame in the rear portion of the machine rockable from and to a normal position about a fixed horizontal axis to engage the platen roller with types arrayed at a low printing line of the machine which extends horizontally transversely of the machine between the keyboard and platen frame, said frame having a lower section rockable on the lower section about a second and parallel axis and journalling the platen roller for lowering of the platen roller from its rest position to a position in which the axis of the roller lies in a path concentric with said fixed axis and containing the printing line of the machine, a member oscillative from and back to a position of rest on each operation of the machine, and means connecting said member with the upper section of the frame to first lower the platen roller about said second axis into said path and then swing it about said fixed axis along said path to the printing line during oscillation of said member from said rest position and thereafter, during oscillation of said member back to said rest position, to swing the platen roller back along said path about said fixed axis and finally swing said roller upwardly about said second axis to its rest position.

13. A machine, as claimed in claim 12, wherein the means connecting said oscillative member and the upper frame section comprises a toggle mechanism which is substantially fully extended in the rest position of said member and is substantially fully folded at the end of the movement of said member from said rest position.

14. A machine, as claimed in claim 13, wherein said oscillative member is an oscillatory shaft parallel to said two axes, the platen roller has a shaft journalled in the upper frame section parallel to said two axes and said oscillative shaft, and the toggle mechanism comprises a pair of identical toggles spaced transversely of the machine and each having a pair of hinged toggle members one of which is pivoted to the shaft of the platen roller and the other one of which is fixed to said oscillative shaft.

15. A machine, as claimed in claim 14, wherein the platen roll shaft lies in a plane containing the printing line of the machine and the oscillative shaft when the platen roll is in printing position.

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