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CALCULATING MACHINE

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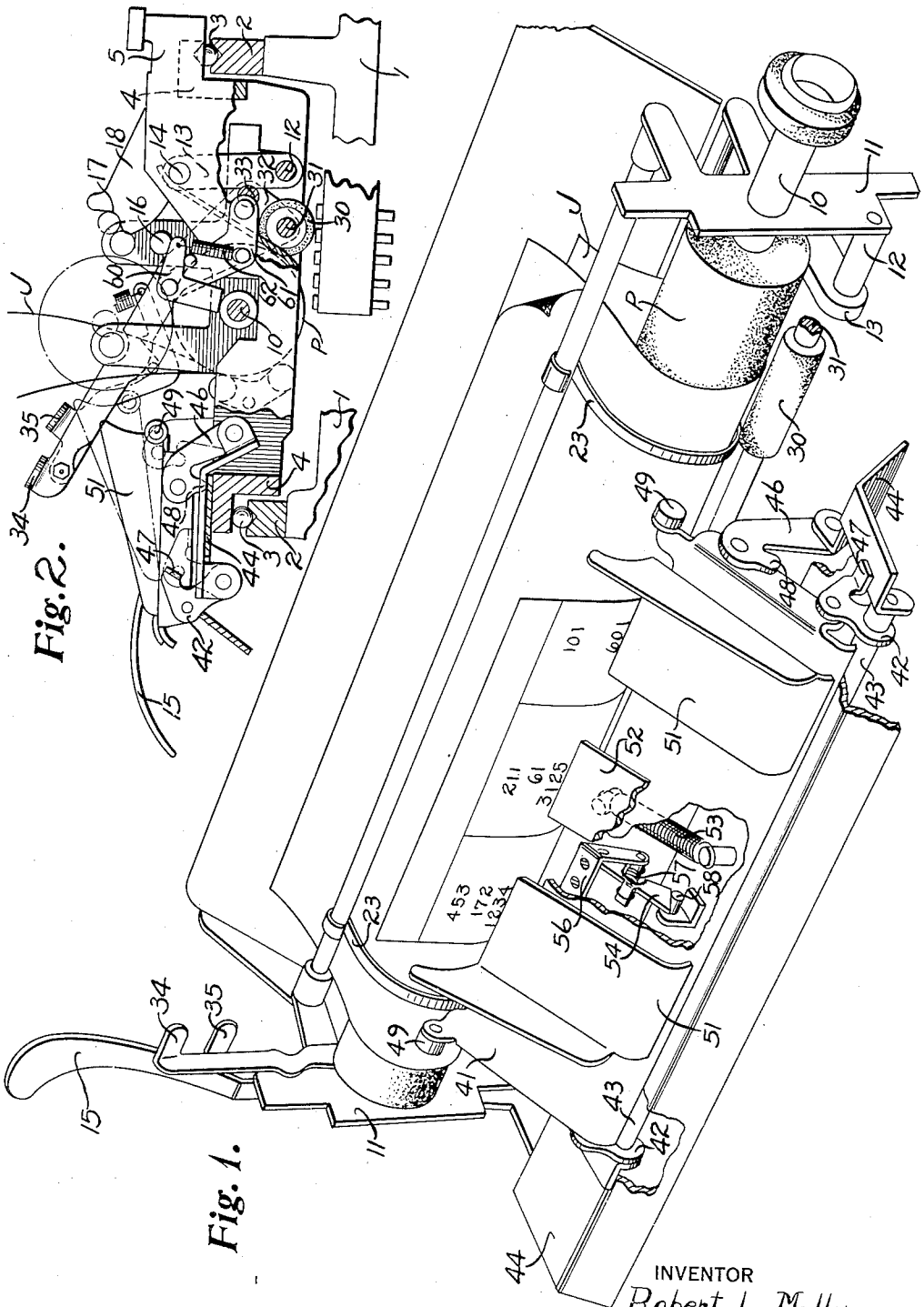


Fig. 2.

Fig. 1.

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CALCULATING MACHINE

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13 Claims. (Cl. 197—127)

This invention relates to paper feeding equipment for calculating machines, more particularly to a front feed mechanism therefor.

In certain types of calculating machines such as the "Burroughs Moon-Hopkins" billing machine it is desirable simultaneously to print a plurality of sheets such as a record or journal sheet, a ledger sheet, and a bill or statement together with such other copies as may be necessary in the particular accounting system used. These individual sheets and accompanying papers often, if not usually, differ as to length and width from the record sheet and therefore require paper equipment peculiarly adapted to handle them.

It is desirable, if not necessary, to have some simple and easy way of feeding the sheets into the machine and aligning them both with respect to the record sheet and with respect to the additional individual sheets. The aligning or collating of the additional sheets must be done without disturbing the record sheet on which the individual entries should be listed in proper spaced relationship.

The general object of this invention is to provide an improved feeding equipment which permits ready insertion and alignment of the papers in a calculating machine.

A further object is to provide means whereby the aligning of the papers may be accomplished without the use of special indicating or collating marks.

Another object is to provide a paper feed and aligning equipment by means of which sheets can be inserted from the front of the machine and aligned while in substantially vertical position with the printed entries thereon visible to the operator.

Other objects and resultant advantages will be apparent from the foregoing description and drawing which discloses one illustrative embodiment of the invention, and in which—

Figure 1 is a perspective view of the paper carriage and associated parts with certain elements cut away to show the aligning table which has been moved into aligning position adjacent the platen, and

Fig. 2 is a right side sectional view taken approximately through the center of the paper carriage of a "Burroughs Moon-Hopkins" machine having the present invention applied thereto and illustrating the machine with the platen in printing position, and with the platen tilted back out of printing position and into front feed position in dot dash line and with the front feed and aligning table in horizontal position ready to receive one or more sheets or cards from the front of the machine.

The present invention is shown applied to a "Burroughs Moon-Hopkins" billing machine of the type shown in the Hopkins Patent 1,336,904 and is an improvement of the front feed and aligning mechanism shown and described in the Muller Patent 1,774,287.

In the latter patent there is shown an aligning table at the front of the paper carriage. The table is normally positioned horizontally and the ledger may be inserted from the front, bottom end foremost and printing down, under the platen and between the platen and the feed rolls when the latter is in open front feed position. Alignment of the ledger sheets is obtained by means of collating marks on the back of the sheets, it being understood, of course, that the sheets are inserted with the printing record down.

The transactions entered upon the ledger sheets do not always extend to the margin thereof and the last printed items thereon do not always appear close to the right hand margin of the forms. For this reason, and others, it is sometimes desirable to be able to align these sheets with the full printed record visible. The present invention makes this possible in that the operator may align the ledger sheets with the latter in full view and with the entire record thereon facing forward and visible to the operator.

Referring to the drawing, the upper portion of the machine frame 1 (Fig. 2) supports transverse guides 2 and having raceways in their upper edges for receiving ball bearings 3 upon which guides 4 of the travelling paper carriage travel. Secured to the guides 4 and the end plates 5 (Fig. 2) of the paper carriage which is stepped across the machine transversely on the guides, a platen feeding mechanism (not shown) is also provided for automatically advancing the platen in the manner shown and described in the foregoing Hopkins and the Muller patents to which reference is made for details of construction.

The carriage supports a platen P journaled on a shaft 10, carried by side plates 11, (Fig. 1) pivoted on a shaft 12, connected by links 13 to a shaft 14, journaled in the side plates 5. This mounting permits the platen to be swung forward and upwardly by means of a handle 15 (Fig. 1) from the position shown in full lines Fig. 2, to the position shown in Fig. 1, and in dot dash lines Fig. 2. That is, the platen may be swung from the full line printing position Fig. 2, to front feed position Fig. 1. When in raised position the platen is retained until released by stud 16, engaging in a notch 17, in end plates 18 carried by the carriage frame 5. When raised the carriage exposes the printing line on the platen so that the printed record may be observed by the operator and also permits front feed insertion of the desired additional forms or sheets.

The record or journal sheet J is fed under the platen from the rear as illustrated in Fig. 1, passed around the platen under spring guide

bands 23, which hold the journal sheet in position. Although the drawing shows only one record sheet or journal sheet and it is understood that any desired number may be used and the necessary carbon sheets will be used when more than one journal sheet is used. The bands 23 serve to retain the journal sheet about the platen when it is moved to front feed position and while additional sheets are inserted and removed for the printing of individual transactions as will later be explained.

The sheets are held in engagement with the platen for line spacing by feed or pressure rolls 30, which hold the journal sheet or sheets in contact with the platen as it is rotated step by step during operation of the machine. These rolls also constitute a front feed means for receiving and holding the work sheet or sheets in front feed position relative to the platen and are movable from closed to open throat position and vice versa. The rollers are carried by a shaft 31 supported in movable plates 32, carried by a cross shaft 33. The left plate 32 has an operating handle or finger piece 34 by means of which the feed rollers are moved into and out of engagement with the platen, that is, from closed to open throat position. Depression of finger piece 34 causes the plates 32 to rock counterclockwise to move the rollers away from the platen. A handle and the rollers may be latched in open throat position away from the platen by a latch which may be released to permit the rollers to grip the papers by moving the finger piece 35 thereof relatively to the finger piece 34. Printing is accomplished by means of type actuated in the usual manner by means (not shown). The foregoing construction is substantially the same as that shown in the Muller Patent 1,774,287 to which reference is made for further details.

As previously stated, it is desirable at times to feed one or more separate ledger or work sheets into the machine from the front and accordingly provisions must be made to receive and align these separate work sheets. This invention provides for this and furthermore, makes it possible to align the separate sheets while they are in a substantially vertical position with the printed record thereon facing the front and in full vision of the operator.

For this purpose a combined paper table or chute and line finder is provided which is swingable and tiltable from a substantially horizontal front feed sheet receiving position to an inclined aligning and line finding position with the rear edge above the front edge and in proximity to the platen thereof. In this latter position the sheet or sheets thereon may be aligned after which the table is returned to horizontal position, which position it occupies during printing operations.

A movable table 41 extends substantially the full width of the carriage and is supported at its forward edge by a link 42 at each end thereof, the lower ends of which are rigidly secured to a cross shaft 43 supported by a stationary table 44 at the front of the paper carriage. The rear of the table is supported by a link 46 at each end thereof, the latter links being considerably longer than the front links 42. From this it can be seen that the table is pivotally movable about its two links at each end from a substantially horizontal front feed sheet supporting position (Fig. 2) to an inclined aligning or line finding position with the rear edge raised and in close proximity to the platen (Fig. 1). The table is limited in its rearward or line finding position by engagement of laterally extending lugs 47 formed on forward links 42 engaging a portion of the stationary frame 44 as shown in Fig. 1. The downward or horizontal position of the table is limited by engagement of projections 48 formed on rear links 46 engaging with the stationary table as shown in Fig. 2.

The ends of the tilting table are provided with rollers 49 adapted to engage the platen when the table is in rearward or line finding position. These rollers perform two functions. First, they maintain the rearward edge of the table and guides properly spaced from the platen so as to permit adjustment of the record sheets and, second, cause retraction of the table to horizontal position as the platen is returned to printing position.

To assist in guiding and aligning the papers, the tilting table is provided with side paper guides 51, the rearward edges of which extend slightly beyond the rear edge of the table and constitute a line finding gauge for aligning the sheets when the table is in inclined position and with the feed rolls still in open or front feed position.

An additional center guide 52 (Fig. 1) may also be provided to assist in line finding in those cases where the printed record does not extend to the margins of the record sheets. Any desired number of guides can be employed and they may be adjusted longitudinally of the tilting table to suit various widths of papers.

The tilting table and line finder is normally urged to horizontal position by a spring 53 one end of which is secured to the table and the other end of which is secured to the stationary table but the table is latched in raised or aligning position after being manually moved to such position by a latch 54, pivotally carried by a bracket 56, secured to the under side of the tilting table 41 and normally urged counterclockwise by spring 57. When the table is in raised position, latch 54 engages a stud 58 carried by the stationary table 44 and retains the tilting table in aligning position. When the platen is lowered to printing position and the table is lowered to front feed position by engagement of the rolls 49, the positive movement of the table will force latch 54 to yield against the action of spring 57 until it clears stud 58 after which spring 53 will retract the tilting table to horizontal position. It will be understood, of course, that immediately after the sheets are aligned, feed rolls 30 will be released to grip all of the sheets prior to return of the platen to printing position, thus retaining the sheets in aligned position as they are returned to printing position.

In machines of this character, particularly where a plurality of sheets are typed at one time, the type hammers (not shown) must be adjusted to give a sufficient blow to cause clear cut printing through the several sheets. For this reason, it is desirable to provide a positive lock for the platen when it is in printing position to prevent raising thereof during printing. Furthermore, it is desired to provide a lock which is operable to prevent raising of the platen, but which is retractable to permit ready lowering of the platen. For this purpose a pawl 60 (Fig. 2) is pivotally secured to a bracket 61 and is constantly urged clockwise by a spring 62. The pawl has a downwardly extending arm which is normally directly over the platen shaft 10. Therefore, as can be seen from Fig. 2, it is necessary when raising the platen to front feed position to first move the

platen slightly forward to clear the pawl and then upwardly to raised position. Upon returning the platen to printing position it is not necessary to impart any particular movement to the platen to get the shaft thereof under the pawl, because the pawl will swing about its pivot against the action of spring 62 and permit rapid return of the platen.

It is believed that the operation of the machine will be readily understood from the foregoing description particularly when taken in connection with the previously mentioned patents. Therefore, the operation of the machine will merely be summarized. When a form is to be inserted, the platen P is moved upward from the full line position of Fig. 2 to the full line position of Fig. 1 or (dot dash position of Fig. 2). Simultaneously the feed rolls are opened by manual depression of the lever 34. The additional form or forms to be front fed are placed upon the table 41, while in its horizontal position, and are inserted rearward beneath the platen and between the platen and feed rolls. The operator then moves the tilting table rearward to its inclined position until it is latched. Because of the linkage, the rear edge is raised above the front edge to line finding position. The rear edge of the table and the guides cause the additional paper sheets to be formed around the platen with the upper edges thereof raised to substantially vertical position. The rear edges of the paper guides not only serve to hold the paper in vertical position but act as line finders for aligning the sheets to correct printing position. Inasmuch as the table is held in raised position both hands of the operator are free for rapid alignment of the front fed sheets. After the sheets have been aligned the feed rolls are released by manipulation of latch 35 to grip all of the sheets about the platen after which the platen is lowered to printing position by use of handle 15. The lowering of the platen also returns or lowers the tilting table to horizontal or sheet receiving position.

After the desired entries have been made, the platen may be raised, the feed rolls released, the forward sheets removed while the journal sheet is held in place after which additional sheets may be inserted over the tilting table which is in horizontal position because of its independence of the platen.

From the foregoing description it is apparent that the invention provides a combined front feed table and line finder which not only permits but induces rapid insertion and alignment of front feed sheets. This desirability is obtained in part at least because of the simplicity of construction, such as the straight and single edge against which the sheets may be aligned and which permits full visibility above and below the printed line, and because of the operation, which is wholly independent of any movement of the platen.

The invention is also particularly well adapted for systems in which two forms are precollated, that is, in which a ledger and statement are simultaneously posted. In such systems the sheets are usually precollated before inserting them into the carriage and the present construction is such that they may be held in precollated position by the operator while being inserted until the outer form is aligned to proper position. It will be apparent that with the present invention there is nothing in the way above the printing line to obstruct the operator in inserting the duplicate forms. Furthermore, when posting lists in vertical columns, it is frequently desired to align according to figures in different columns. The provision of the separate adjustable guides is particularly well adapted for this type of posting. Other advantages resulting from the foregoing construction will be apparent to those skilled in the art to whom it will also be clear that changes in the details of construction may be made without departing from the spirit and scope of this invention.

I claim:

1. A front feed machine of the class described having a printing mechanism, adapted to print along a printing line, a platen movable from printing position relative to said printing mechanism to a front feed position and vice versa, a front feed means for receiving and holding a work sheet in front feed position relative to said platen, said front feed means being movable from a closed to an open throat position and vice versa, a combination front feed paper table and line finder in front of said platen, said table being operable, when in sheet-receiving position, to guide a work sheet under said platen and into said open front feed throat, while the platen is in front feed position and being movable independently of movements of said platen and as the latter is in front feed position, to a line finding position with its rear edge above its forward edge and in proximity to said platen, line feeding means on the rear of said table for enabling a work sheet to be aligned with respect to the printing line, means for closing said front feed throat and moving said platen to printing position, and means for moving said front feed table to sheet receiving position.

2. A front feed machine of the class described having a printing mechanism, adapted to print along a printing line, a platen movable from printing position relative to said printing mechanism to a front feed position and vice versa, a front feed means for receiving and holding a work sheet in front feed position relative to said platen, said front feed means being movable from a closed to an open throat position and vice versa, a combination front feed paper table and line finder in front of said platen, said table being pivoted adjacent its rear and forward ends for swinging and tilting movement and being operable, when in sheet receiving position, to guide a work sheet under said platen and into said open front feed throat, while the platen is in front feed position and being movable independently of movements of said platen and as the latter is in front feed position, to a line finding position with its rear edge above its forward edge and in proximity to said platen, line finding means on the rear of said table for enabling a work sheet to be aligned with respect to the printing line, means for closing said front feed throat and moving said platen to printing position, and means for moving said front feed table to sheet receiving position.

3. A front feed machine of the class described having a printing mechanism, adapted to print along a printing line, a platen movable from printing position relative to said printing mechanism to a front feed position and vice versa, a front feed means for receiving and holding a work sheet in front feed position relative to said platen, said front feed means being movable from a closed to an open throat position and vice versa, a combination front feed paper table and line finder in front of said platen, links pivotally connecting said table at two spaced points thereon to said machine, for swinging and tilting movements, said table being operable, when

in sheet receiving position, to guide a work sheet under said platen and into said open front feed throat, while the platen is in front feed position and being movable independently of movements of said platen and as the latter is in front feed position, to a line finding position with its rear edge above its forward edge and in proximity to said platen, a line gauge on the rear of said table for enabling a work sheet to be aligned with respect to the printing line, means for closing said front feed throat and moving said platen to printing position, and means for moving said front feed table to sheet receiving position.

4. A front feed machine of the class described having a printing mechanism, adapted to print along a printing line, a platen movable from printing position relative to said printing mechanism to a front feed position and vice versa, a front feed means for receiving and holding a work sheet in front feed position relative to said platen, said front feed means being movable from a closed to an open throat position and vice versa, a combination front feed paper table and line finder in front of said platen, said table being operable, when in sheet receiving position, to guide a work sheet under said platen and into said open front feed throat, while the platen is in front feed position and being movable independently of movements of said platen and as the latter is in front feed position, to a line finding position with its rear edge above its forward edge and in proximity to said platen, a line gauge on the rear of said table for enabling a work sheet to be aligned with respect to the printing line, means for closing said front feed throat and moving said platen to printing position, and means automatically moving said front feed table to sheet receiving position as the platen is moved to printing position.

5. A front feed machine of the class described having a printing mechanism, adapted to print along a printing line, a platen movable from printing position relative to said printing mechanism to a front feed position and vice versa, a front feed means for receiving and holding a work sheet in front feed position relative to said platen, said front feed means being movable from a closed to an open throat position and vice versa, a combination front feed paper table and line finder in front of said platen, means pivotally connecting said table at two spaced points thereof to the machine for swinging and tilting movement, said table being operable, when in sheet receiving position, to guide a work sheet under said platen and into said open front feed throat, while the platen is in front feed position and being movable independently of movements of said platen and as the latter is in front feed position, to a line finding position with its rear edge above its forward edge and in proximity to said platen, a line gauge on the rear of said table for enabling a work sheet to be aligned with respect to the printing line, means for closing said front feed throat and moving said platen to printing position, and means automatically moving said front feed table to sheet receiving position as the platen is moved to printing position.

6. A front feed machine of the class described having a printing mechanism, adapted to print along a printing line, a platen movable from printing position relative to said printing mechanism to a front feed position and vice versa, a front-feed means for receiving and holding a work sheet in front feed position relative to said platen, said front feed means being movable from a closed to an open throat position and vice versa, a combination front feed paper table and line finder in front of said platen, means pivotally connecting said table at two spaced points thereof to said machine for swinging and tilting movement from horizontal position to inclined position in close proximity to said platen, said table being operable when in horizontal position to receive and guide a work sheet under said platen and into said open front feed throat while the platen is in front feed position and being movable independently of movements of said platen and as the latter is in front feed position, to said inclined line finding position with its rear edge above its forward edge and in close proximity to said platen, a line gauge on the rear of said table for enabling a work sheet to be aligned with respect to the printing line, means for closing said front feed throat and moving said platen to printing position, and means for moving said front feed table to sheet receiving position.

7. A front feed machine of the class described having a printing mechanism, adapted to print along a printing line, a platen movable from printing position relative to said printing mechanism to a front feed position and vice versa, a front feed means for receiving and holding a work sheet in front feed position relative to said platen, said front feed means being movable from a closed to an open throat position and vice versa, a combination front feed paper table and line finder in front of said platen, means pivotally connecting said table at two spaced points thereof to said machine for swinging and tilting movement from horizontal position to inclined position in close proximity to said platen, said table being operable when in horizontal position to receive and guide a work sheet under said platen and into said open front feed throat, while the platen is in front feed position and being movable independently of movements of said platen and as the latter is in front feed position, to said inclined line finding position with its rear edge above its forward edge and in close proximity to said platen, means on the rear of said table for aligning a work sheet with respect to the printing line, means for closing said front feed throat and moving said platen to printing position, and means automatically moving said front feed table to sheet receiving position as the platen is moved to printing position.

8. A front feed machine of the class described having a printing mechanism, adapted to print along a printing line, a platen movable from printing position relative to said printing mechanism to a front feed position and vice versa, a front feed means for receiving and holding a work sheet in front feed position relative to said platen, said front feed means being movable from a closed to an open throat position and vice versa, a combination front feed paper table and line finder in front of said platen, means pivotally connecting said table at two spaced points thereof to said machine for swinging and tilting movement from horizontal position to inclined position in close proximity to said platen, said table being movable to either position independently of movements of said platen and being operable, when in horizontal position to receive and guide a work sheet under said platen and into said open front feed throat, while the platen is in front feed position and being operable when in inclined position with the platen in front feed position, to serve as a line finder with its rear edge above its forward edge and in

proximity to said platen, means on the rear of said table for aligning a work sheet with respect to the printing line, means for closing said front feed throat and moving said platen to printing position, and means for moving said front feed table to sheet receiving position.

9. A front feed machine of the class described having a printing mechanism, adapted to print along a printing line, a platen movable from printing position relative to said printing mechanism to a front feed position and vice versa, a front feed means for receiving and holding a work sheet in front feed position relative to said platen, said front feed means being movable from a closed to an open throat position and vice versa, a combination front feed paper table and line finder in front of said platen, means pivotally connecting said table at two spaced points thereof to said machine for swinging and tilting movement from horizontal position to inclined position in close proximity to said platen, said table being movable to either position independently of movements of said platen and being operable, when in horizontal position to receive and guide a work sheet under said platen and into said open front feed throat, while the platen is in front feed position and being operable when in inclined position with the platen in front feed position, to serve as a line finder with its rear edge above its forward edge and in proximity to said platen, a line gauge on the rear edge of said table for enabling a work sheet to be aligned with respect to the printing line, means for closing said front feed throat and moving said platen to printing position, and means automatically moving said front feed table to sheet receiving position, as the platen is moved to printing position.

10. A front feed machine of the class described having a printing mechanism, adapted to print along a printing line, a traveling carriage, a platen, carried by said carriage, movable from printing position relative to said printing mechanism to a front feed position and vice versa, a front feed means for receiving and holding a work sheet in front feed position relative to said platen, said front feed means being movable from a closed to an open throat position and vice versa, a combination front feed paper table and line finder, carried by said carriage, in front of said platen, means pivotally connecting said table at two spaced points thereof to said machine for swinging and tilting movement from horizontal position to inclined position in close proximity to said platen, said table being movable to either position independently of movements of said platen and being operable, when in horizontal position to receive and guide a work sheet under said platen and into said open front feed throat, while the platen is in front feed position and being operable when in inclined position with the platen in front feed position, to serve as a line finder with its rear edge above its forward edge and in proximity to said platen, means on the rear of said table for aligning a work sheet with respect to the printing line, means for closing said front feed throat and moving said platen to printing position, and means automatically moving said front feed table to sheet receiving position, as the platen is moved to printing position.

11. A front feed machine of the class described having a printing mechanism, adapted to print along a printing line, a platen movable from printing position relative to said printing mechanism to a front feed position and vice versa, front feed rolls for receiving and holding a work sheet in front feed position relative to said platen, said front feed rolls being movable with said platen from printing position to front feed position and vice versa and being movable from a closed to an open throat position and vice versa, a combination front feed paper table and line finder in front of said platen, means pivotally connecting said table at two spaced points thereof to said machine for swinging and tilting movement from a horizontal position to an inclined position in close proximity to said platen, said table being operable when in horizontal position to receive and guide a work sheet under said platen and into said open front feed throat, while the platen is in front feed position and being movable independently of movements of said platen when the latter is in front feed position, to inclined line finding position with its rear edge above its forward edge and in proximity to said platen, means on the rear of said table for aligning a work sheet with respect to the printing line, means for closing said front feed throat and moving said platen to printing position, and means automatically moving said front feed table to sheet receiving position as the platen is moved to printing position.

12. A front-feed machine of the class described having a platen, front-feed means for receiving and holding a work sheet in front-fed position relative to said platen, said front-feed means being movable from a closed to an open-throat position and vice versa, a front-feed paper chute normally occupying a sheet-receiving position in which it is operable to guide a work sheet into said front-feed throat while it is open, said chute being mounted so that it is movable to cause its rear edge to loosely engage said work sheet and move the latter about said platen with the upper end of said sheet in position to make the front side thereof clearly visible, and to a position in which the rear edge of said chute forms a line finding means, and means operable to close said front-feed throat and to cause said chute to be automatically returned to sheet-receiving position.

13. A front-feed machine of the class described having a platen, front-feed means for receiving and holding a work sheet in front-fed position relative to said platen, said front-feed means being movable from closed to open-throat position and vice versa, a front-feed paper chute normally occupying a sheet-receiving position in which it is operable to guide a work sheet into said front-feed throat while the latter is open, said chute being mounted so that it may be moved to a position to cause the rear edge to loosely engage said work sheet and move it about said platen to make the front side of said sheet clearly visible, and to a position in which the rear edge of said chute is adjacent said work sheet with the front portion of said chute lower than the rear whereby the rear edge forms a line finding means and whereby the body of said chute is out of the line of vision to said work sheet, and means operable to close said front-feed throat and to automatically cause said chute to be returned to sheet-receiving position.

ROBERT L. MULLER.

CERTIFICATE OF CORRECTION.

Patent No. 2,055,552. September 29,1936.

ROBERT L. MULLER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 28, claim 1, for the word "feeding" read finding; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of December, A. D. 1936.

Henry Van Arsdale

Acting Commissioner of Patents.

(Seal)