May 13, 1941. H. W. CLARK 2,241,445

DOUBLE PAPER FEEDING MECHANISM FOR CASH REGISTERS

Filed Aug. 6, 1938 3 Sheets-Sheet 1

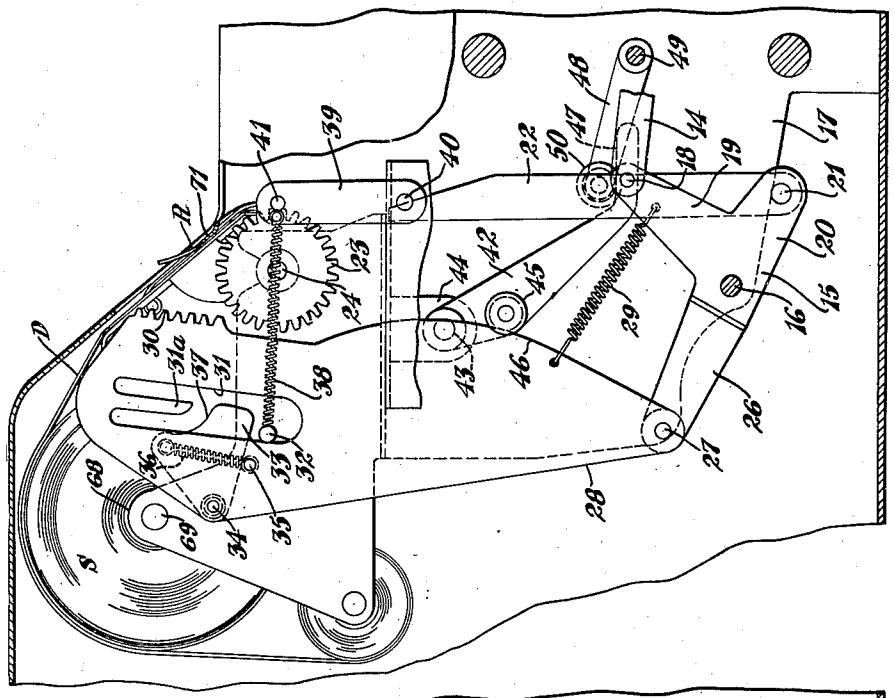


Fig. 1.

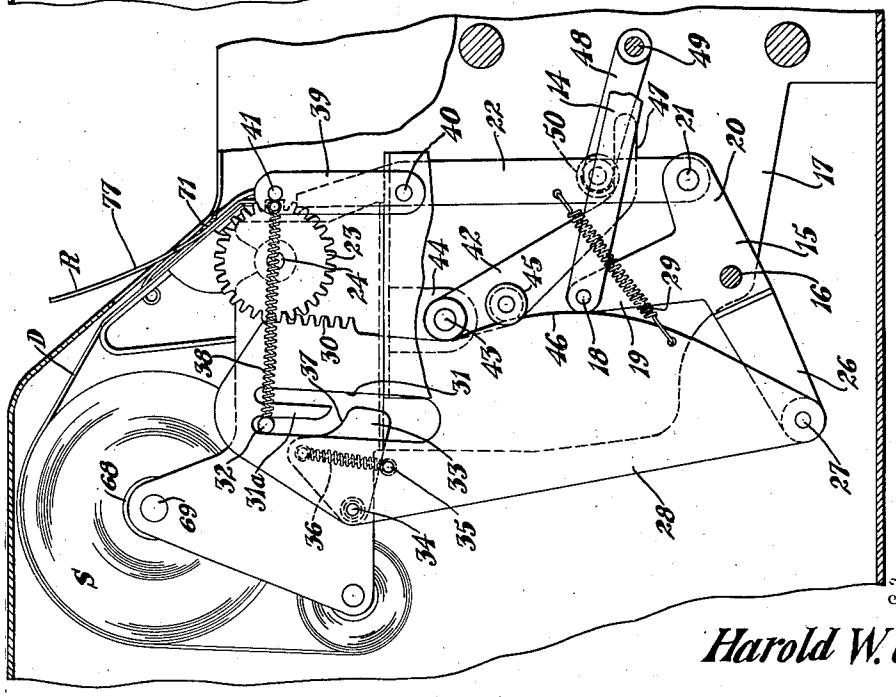


Fig. 2.

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DOUBLE PAPER FEEDING MECHANISM FOR CASH REGISTERS

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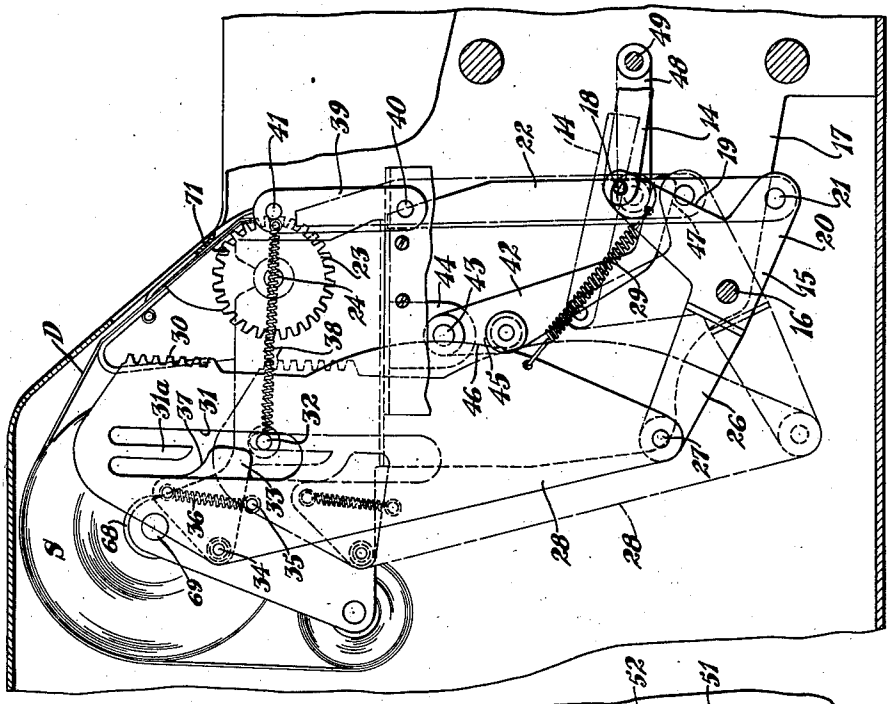


Fig. 3

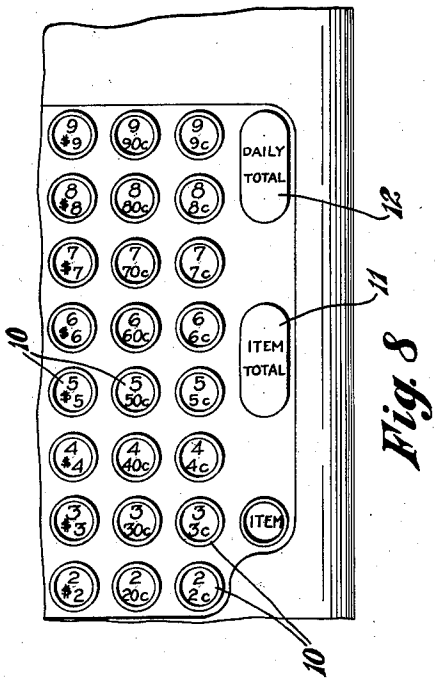


Fig. 8

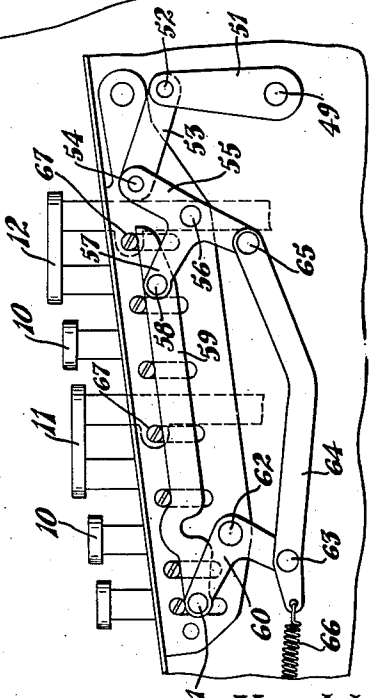


Fig. 9

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DOUBLE PAPER FEEDING MECHANISM FOR CASH REGISTERS

Filed Aug. 6, 1938 3 Sheets-Sheet 3

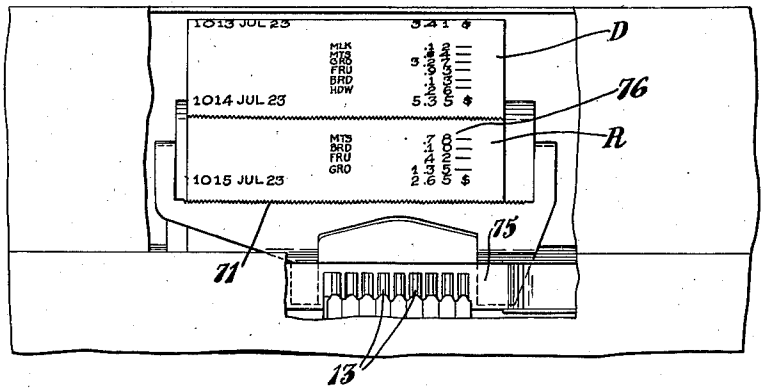


Fig. 4

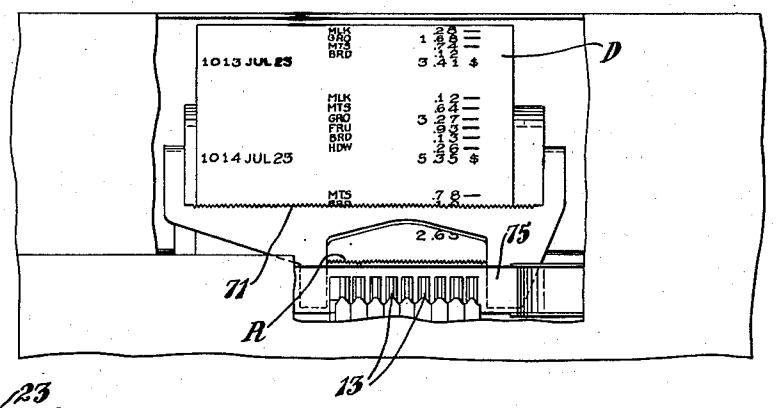


Fig. 5

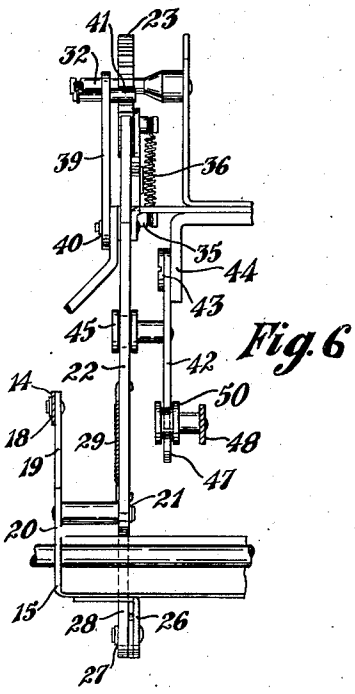


Fig. 6

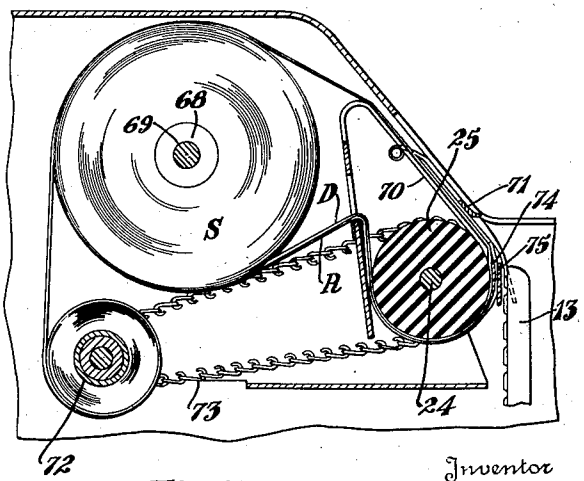


Fig. 7

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Patented May 13, 1941

2,241,445

UNITED STATES PATENT OFFICE

2,241,445

DOUBLE PAPER FEEDING MECHANISM FOR CASH REGISTERS

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Application August 6, 1938, Serial No. 223,500

8 Claims. (Cl. 197—133)

The invention relates to cash registers and similar machines and more particularly to paper feeding mechanism for feeding a double paper strip so as to provide a record or detail strip to be rewound in the machine as in usual and ordinary practice and also a receipt or ticked strip providing a ticket or receipt which may be torn off and given to the customer with each transaction.

It is desirable that cash registers and similar machines be provided with double paper strips for recording transactions, one strip forming the usual record or detail strip which is automatically rewound within the machine so as to be inaccessible to the operator, the printed portion of the other strip being adapted to be torn or cut off after each transaction providing a receipt to be given to the customer.

It is known that attempts have been made to provide paper equipment for producing the above results by passing two strips of paper to printing position independently of each other and at distances substantially at right angles to each other, but such machines require considerable additional mechanism.

Attempts have also been made to provide paper equipment for producing these results by passing two superimposed strips of paper upward between the printing mechanism and the platen roll, but such machines require complicated mechanism for feeding the receipt strip more rapidly than the record or detail strip.

The object of the present improvement is to provide paper feeding equipment for cash registers and similar machines which overcomes the objections to the type of paper feeding mechanism above referred to and which is simple and inexpensive in construction and efficient in operation and which operates without waste of paper in either the record strip or the receipt strip.

An important object of the invention is to provide such a paper feeding equipment in which the record or detail strip and the receipt or ticket strip are simultaneously fed upward between the printing mechanism and the platen roll to printing position and then advanced to the position where the printed ticket or receipt may be torn off after which both strips are automatically and simultaneously fed backward to printing position for the next printing operation so as not to produce any undue space between different transactions, thus, avoiding waste of paper in either strip.

A further object is to provide means operated by the operation of the total key for advancing both strips to position for tearing off the receipt or ticket from the receipt strip and then returning both strips together to the printing position before the next transaction is printed.

Another object is to provide means for simultaneously printing each item upon both strips by means of double inked ribbons.

The above objects together with others which will be apparent from the drawings and following description may be attained by constructing the improved paper feeding equipment in the manner illustrated in the accompanying drawings in which—

Figure 1 is a sectional elevation of the improved paper feeding equipment showing the parts in the position they assume during the operation of the machine to record a total.

Fig. 2, a similar view of the paper feeding equipment showing the parts in the position they assume at the completion of each transaction with the paper strips in the tear-off position and the printed end of the receipt or ticket strip ready to be torn from the strip;

Fig. 3, shows in full lines and broken lines the upper and lower limits of movement of the operating mechanism for the paper feeding equipment during each succeeding item of a transaction.

Fig. 4, a fragmentary elevation of the platen and paper strips showing the same in the position shown in Fig. 2 with the receipt strip in position to have a receipt or ticket torn therefrom;

Fig. 5, a view similar to Fig. 4 showing the paper strips wound back to printing position for a new transaction;

Fig. 6, a fragmentary sectional elevation of the mechanism shown in Figs. 1, 2 and 3;

Fig. 7, a transverse sectional elevation through the platen roll and associated parts;

Fig. 8, a fragmentary plan view of a portion of the key board; and

Fig. 9, a fragmentary side elevation of the linkage operated by the total keys for controlling the operation of the paper feeding equipment.

Similar numerals refer to similar parts throughout the drawings.

The invention is shown as applied to a "McCaskey" cash register of the general type disclosed in Johantgen Patents No. 1,306,112 and No. 1,336,840, the general adding machine structure being substantially as shown in said patents and therefore the same will be described only briefly herein, reference being made to said Jo-

hantgen patents for further disclosure thereof.

The invention as illustrated is equally applicable to the hand operated type of cash register or the motor driven type of register in which a motor key is substituted for the hand lever to operate the main shaft of the machine to record each item or total of a transaction.

The machine illustrated is adapted to be controlled in customary manner by the usual depressible amount keys 10, and if desired, any required arrangement or combination of code keys (not shown), and the usual item total key 11 and daily total key 12.

As in usual practice, the main shaft (not shown), may be operated either by a hand lever or the usual motor key for operating the machine after the proper keys are depressed for each item to form the usual adding operation and to operate the type bars 13 in usual and ordinary manner to record each item or total as the case may be, all in usual and well-known manner.

For the purpose of the present invention the link 14 may be indirectly connected to the main shaft of the machine in any usual and well-known manner and arranged to be moved from the position shown in Fig. 2 to that shown in Fig. 1, and then returned to the position shown in Fig. 2 during each operation of the machine to record an item or total of a transaction.

This link 14 is connected to and operates the paper feeding equipment through the T-shaped lever 15, which is pivoted as at 16 upon a stationary portion of the frame 17 of the machine, the rear end of the lever 14 being pivoted as at 18 to the upwardly disposed arm 19 of said lever.

The forward end 20 of the T-shaped lever 15 is pivotally connected at 21 to the lower end of an operating pawl 22, which engages the toothed wheel 23 upon the shaft 24 of the platen roll 25 to rotate said platen roll step by step in a counter-clockwise direction as viewed in Figs. 1 to 3 and 7.

The rear end 26 of the T-shaped lever is pivotally connected at 27 to the lower end of the slotted rack plate 28 and a pull spring 29 is connected at opposite ends to the plate 28 and the pawl 22.

Rack teeth 30 are formed upon the forward edge of the plate 28 near the upper end thereof for cooperation with the toothed wheel 23 as will be later explained, and a substantially vertical slot 31 is formed in the upper portion of said plate, the upper end portion of the slot being divided by a depending finger 31*a*, and a stud 32 fixed upon the frame 17 or other stationary portion of the machine is located through said slot. A cam plate 33 is pivoted as at 34 upon the plate 28 and normally urged into contact with the stud 35, upon said plate, by means of the pull spring 36 whereby the arcuate upper edge 37 of the cam plate is normally located at a point slightly spaced below the lower end of the depending finger 31*a*.

A pull spring 38 may be connected at one end to the stud 32 and at the other end to the brake pawl 39 which is pivoted at its lower end as at 40 to the frame 17 or other stationary portion of the machine and provided at its upper end with a roller or stud 41 adapted to engage in the toothed wheel 23 upon the platen roll shaft in order to prevent overrunning of the platen roll.

A lever 42 is pivoted at its upper end as at 43 to a depending bracket 44 fixed upon the frame or other stationary portion of the machine and is provided intermediate its ends with a grooved roller 45 adapted to ride upon the arcuate forward edge 46 of the slotted rack plate 28, the lower free end of said lever being bent forwardly as at 47.

A rocker arm 48 is fixed upon the rocker shaft 49 and has a grooved roller 50 upon its free end adapted to ride upon the bent lower end 47 of the lever 42.

On the other side of the machine, as shown in Fig. 9, the rocker shaft 49 has an upright rocker arm 51 fixed thereon and pivotally connected at its upper end as at 52 to one end of link 53, the other end of which is pivotally connected as at 54 to the upper end of a T-shaped lever 55 pivoted as at 56 upon the frame or other stationary portion of the machine, the angular arm 57 of said lever being pivotally connected as at 58 to a bar 59 which is supported at its other end by the bell crank lever 60 to one end of which the bar is pivotally connected as at 61.

The bell crank 60 is pivoted as at 62 upon the frame of the machine and the lower arm thereof is pivotally connected as at 63 to one end of a link 64, the other end of which is pivotally connected as at 65 to the lower end of the T-shaped lever 55.

A pull spring 66 is connected to the forward end of the link 64 and to a stationary portion of the frame to normally hold the parts in the position shown in Fig. 9.

The item total key 11 and the daily total key 12 are each provided with a stud 67 overhanging the upper edge of the bar 59 whereby a depression of either one of these total keys will cause the T-shaped lever 55 and bell crank 60 to swing forward or counter-clockwise upon their pivots and through the link 53, the rocker arm 51 and rocker shaft 49 will be rotated counter-clockwise swinging the rocker arm 48 upward from the position shown in Fig. 3 to that shown in Figs. 1 and 2.

The detail or record strip D and the receipt or ticket strip R are wound double upon a stock roll S carried upon the usual spool 68 journalled upon a spindle 69 and as the strips are withdrawn from the stock roll they are passed down below and around the platen roll 25, as shown in Fig. 7, and then upward over the front of the platen plate 70 and beneath the tear-off plate 71, the detail strip continuing upward over the platen plate then over the top of the stock roll S and downward to the spool 72 upon which it is rewound as in usual and ordinary practice, said spool being preferably connected by a chain 73 or the like with the platen roll 25 as in usual manner so as to automatically wind said detail strip upon the spool 72 as the machine is operated.

An ink ribbon 74 of usual and ordinary construction is located between the two paper strips on the front side of the platen roll and the second ink ribbon 75 is located between the receipt strip R and the type bars 13, each of the ink ribbons operating as in usual and ordinary practice, whereby with each operation of the printing mechanism the same item or total is printed simultaneously upon both paper strips.

In the operation of the machine as a total is recorded, after each transaction, the parts are in the position shown in Fig. 2. The transaction just recorded is indicated upon the receipt strip R at 76 in Fig. 4. The upper end portion 77 of the receipt strip, containing this transaction, is then torn off upon the tear-off plate 71.

After the next item is placed in the machine and the main shaft operated to record the same, the T-shaped lever **15** will be swung from the position shown in Fig. 2 to that shown in full lines in Fig. 3 raising the slotted rack plate **28**.

Since the teeth **30** of the rack plate **28** are in mesh with the toothed wheel **23** during this upward movement, the wheel **23** and platen roll **25** will be rotated backward, or clockwise, by this upward movement of the rack plate, moving the paper strips D and R back to the position shown in Fig. 5 so that the first item of each transaction will be printed upon the detail strip just a short distance below the total of the preceding transaction, as clearly shown in Fig. 5.

During this upward movement of the rack plate **28**, the stud **32** will ride out of the vertical slot on the left side of the finger **31***a*, and over the curved upper surface **37** of the cam plate **33**, which is held against downward movement upon its pivot **34**, by contact with the stud **35**.

At this point the spring **66** (Fig. 9) will, through the linkage **64**, **55**, **53**, **51**, oscillate the rock shaft **49** in a clockwise direction, as viewed in Fig. 9, and counterclockwise as viewed in Figs. 1, 2 and 3, and through the rocker arm **48** and roller **50** thereon, will swing the lever **42** back to the normal position as shown in Fig. 3.

It will be clear that this action of the lever **42**, will, through the roller **45** thereon, swing the rack plate **28** to the left, upon its pivot, so that the right side of the slot **31** will bear against the stud **32** as the rack plate reaches the upper limit of its movement, as shown in full lines in Fig. 3.

In this position it will be seen that the teeth **30** of the rack plate are moved to the left of, as well as above the toothed wheel **23**. As the operation of the machine continues the rack plate **28** will then move downward to the dot and dash position shown in Fig. 3, the roller **45**, on the lever **42** continuing to hold the right side of the slot **31** against the stud **32**, so that the teeth **30**, upon the rack plate **28**, will remain out of engagement with the toothed wheel **23**, so that as the item is printed the usual line spacing only is performed.

As each succeeding item of a transaction is recorded the rack plate **28** will move up and down between the two positions shown in Fig. 3, without engaging the toothed wheel **23** by the teeth **30**, the wheel **23** being merely advanced one space for each item by means of the pawl **22**.

When the total for each transaction is taken, the total key **11** is depressed and the main shaft is operated in customary manner. The depression of the total key will rotate the levers **55** and **60** counter-clockwise, and through the link **53** and lever **51** the shaft **49** will be rotated counter-clockwise, as viewed in Fig. 9.

This will swing the rocker arm **48** to the raised position, as shown in Figs. 1 and 2, and as the rack plate **28** moves upward, from the broken line position shown in Fig. 3, stud **32** will ride down along the right side of the finger **31***a*, and along the right side of the cam plate **33**, and as the cam plate passes out of contact with the stud, the spring **29** will pull the rack plate forward, or to the right as shown in Fig. 1, with the teeth **30** in line to engage the toothed wheel **23** on the next downward movement of the rack plate.

As the totaling operation is completed the rack plate **28** will move downward from the position shown in Fig. 1 to that shown in Fig. 2. The lower edge of the cam plate **33** will contact the stud **32**, as the rack plate moves down, swinging said cam plate upward upon the pivot **34**, and against the pull of the spring **36**, so that the stud **32** will ride against the left side of the slot **31**, from the bottom to the top of said slot, and being received on the left side of the finger **31***a*, as shown in Fig. 2.

During this downward movement of the rack plate the platen will be rotated counter-clockwise, as viewed in Fig. 2, so as to move the detail strip and receipt strip to the position shown in Figs. 2 and 4, when the receipt portion **77** of the receipt strip may be torn from the strip, upon the plate **71**, and the machine is ready for the next transaction, the operation continuing as above described.

With the parts in the position shown in Fig. 2, which illustrates the condition after a total taking operation, it should be noted that the spring **66**, acting through the rocker arm **48**, and roller **45** upon the lever **42**, is pressing the left side of the finger **31***a* against the stud **32**.

As the slotted rack plate **28** is again raised during the first portion of the cycle of operation, the spring assists the cam edge **37** of the cam plate **33** in moving the rack plate **28** to the full line position shown in Fig. 3, and maintains the rack plate in that position whenever the same is raised with no total key depressed.

It should also be noted that on a total operation the rocker arm **48** is raised while the rack plate **28** is still in the dotted line position shown in Fig. 3, but movement of the rack plate, by the spring **29**, to the position shown in Fig. 2, will be prevented by the finger **31***a* and cam plate **33** until the rack plate raised sufficiently to assume the position shown in Fig. 1, at which time the teeth **30**, upon said rack plate, have passed above the pinion **23** on the platen roll.

I claim:

1. A machine of the class described having a platen, means for holding a paper strip about said platen in feeding relation thereto and in printing position in front of said platen, a control key, means operating automatically during an ordinary operation of the machine to line space said platen, and means operating automatically during an operation of the machine under control of the control key when the control key is depressed to advance the platen to feed the last printed entry a predetermined distance beyond the printing line and to then reverse the platen to feed the paper strip backward toward the printing line upon the next operation of the machine.

2. A machine of the class described having a control key, a rotatable platen, operating mechanism, means for supporting a strip of paper in printing relation to said platen for receiving the printed items and totals thereof, means for rotating said platen step by step for line spacing said paper strip, and means operated by the operating mechanism under control of the control key when the control key is depressed for advancing the paper strip to feed the last printed entry forward, and for then feeding the paper strip backward toward the printing line upon the next operation of the machine.

3. A machine of the class described having a control key, a rotatable platen, means for supporting a strip of paper in printing relation to said platen for receiving the printed items and totals thereof, means for rotating said platen step by step for line spacing said paper strip, a toothed wheel upon the platen, a reciprocating rack plate having a slot therein and a finger lon-

gitudinally of the slot dividing a part of said slot, means including a stationary stud engaged in said slot for normally holding the rack plate out of contact with the toothed wheel when the stud is on one side of the finger, and means controlled by the control key for moving said rack plate into engagement with the toothed wheel for enabling the rack to impart greater movement to said platen than said line spacing movement to feed the last printed entry forwardly with the stud on the other side of the finger, so that the portion of the paper strip bearing said last printed entry may be torn off, and for then rotating said platen in reverse direction to feed the paper strip backward toward the printing line upon the next operation of the machine and means for so moving and controlling the movement of the rack, the controlling means including said stud and finger, and a movable cam mounted on the rack and projecting into said slot below said dividing finger, said cam being movable to an inoperative position by said stud upon downward movement of said rack when the rack is in engagement with the toothed wheel.

4. In a machine of the class described, in combination a platen with toothed wheel and pawl mechanism having connections for rotating the platen by pre-determined steps in line spacing, means for supporting a strip of paper for feeding by the platen and in printing position in front of the platen, operating mechanism for operating the various devices embodied in the machine, a control key, and means controlled by the control key and operated by the operating mechanism for imparting greater movement to the platen to feed the paper strip forwardly a predetermined distance beyond the printing line and for then rotating the platen in reverse direction to feed the paper strip backward a less distance than the forward movement to a new printing line a predetermined position upon the next operation of the machine.

5. In a machine of the class described, in combination a platen with toothed wheel and pawl mechanism having connections for rotating the platen by pre-determined steps in line spacing, means for supporting a strip of paper for feeding by the platen, operating mechanism for operating the various devices embodied in the machine, a control key, a reciprocating rack plate, means for normally holding said rack plate out of contact with the toothed wheel, and means controlled by the control key and operated by said operating mechanism for moving said rack plate into engagement with the toothed wheel for imparting greater movement to said platen than the line spacing to feed the paper strip forwardly and for then rotating the platen in reverse direction to feed the paper strip backward to a pre-determined position upon the next operation of the machine.

6. A machine of the class described having a platen, means for holding a paper strip about said platen in feeding relation thereto and in printing position in front of the platen, a control key, means operating automatically during an ordinary operation of the machine to line space said platen, and means, including a toothed wheel upon the platen and a reciprocating rack plate for engagement with the toothed wheel, operating automatically during an operation of the machine with the control key depressed to advance the platen to feed the paper strip forwardly a predetermined distance beyond the printing line and to then reverse the platen to feed the paper strip backward toward the printing line to a pre-determined point during the next operation of the machine.

7. In a machine of the class described, in combination a platen with toothed wheel and pawl mechanism having connections for rotating the platen by predetermined steps in line spacing, means for supporting a strip of paper for feeding by the platen, operating mechanism for operating the various devices embodied in the machine, a control key, a reciprocating rack plate having a cam surface edge, means for normally holding said rack plate out of contact with the toothed wheel, and means including a lever having a roller engaging said cam surface edge, controlled by said control key and operated by said operating mechanism for moving said rack plate into engagement with the toothed wheel for imparting greater movement to said platen to feed the paper strip forwardly and for then rotating the platen in reverse direction to feed the paper strip backward to a predetermined position upon the next operation of the machine.

8. In a machine of the class described, in combination a platen with a toothed wheel and pawl mechanism having connections for rotating the platen by predetermined steps in line spacing, means for supporting a strip of paper for feeding by the platen, operating mechanism for operating the various devices embodied in the machine, a control key, a reciprocating rack plate, said operating mechanism including a movable member upon which the rack plate is pivotally mounted, spring means for urging the rack plate toward the toothed wheel, a lever having a roller engaging the edge of the rack plate for normally holding the rack plate out of contact with the toothed wheel, means controlled by the control key for moving said lever to permit the rack plate to be moved into engagement with the toothed wheel by said spring means, other mechanism for imparting greater movement to said platen to feed the paper strip forwardly and for then rotating the platen in reverse direction to feed the paper strip backward to a predetermined position upon the next operation of the machine.

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