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C. J. IRA

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PAPER FEEDING MEANS FOR ACCOUNTING MACHINES AND THE LIKE

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FIG. 1

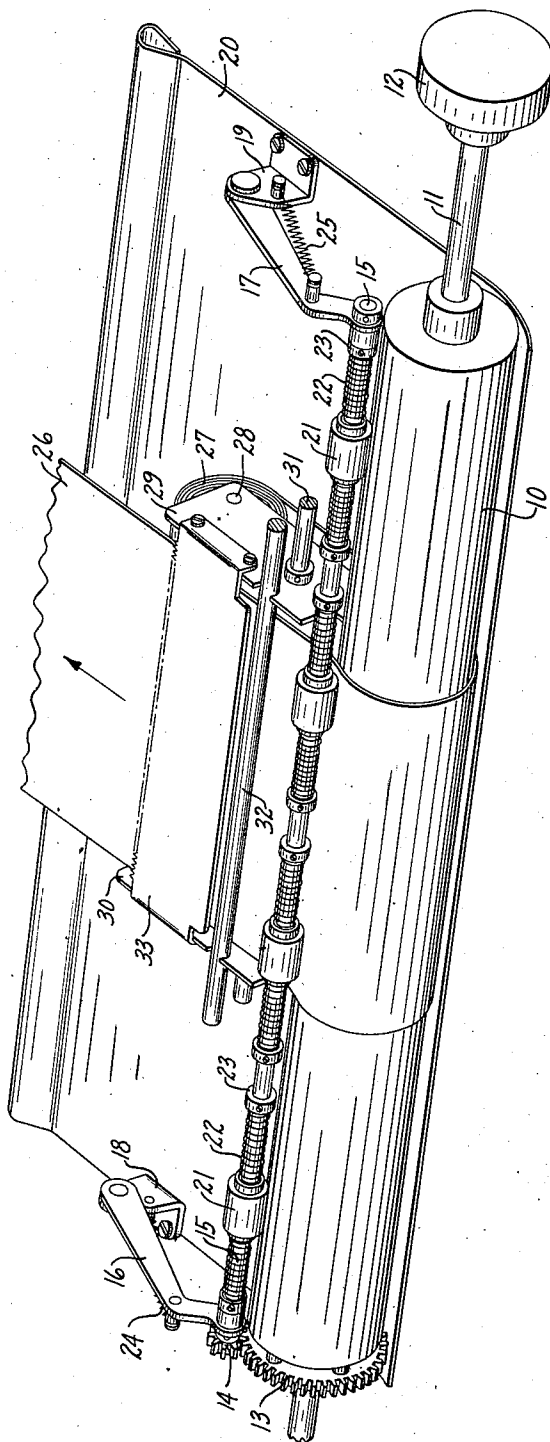


FIG. 3

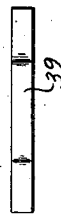
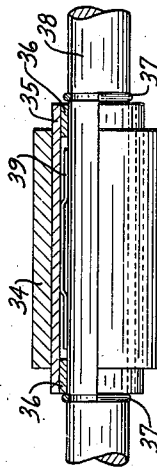


FIG. 2



Clarence J. Ira
Inventor

By *Harold Bent*
His Attorney

UNITED STATES PATENT OFFICE

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PAPER FEEDING MEANS FOR ACCOUNTING
MACHINES AND THE LIKE

Clarence J. Ira, Portland, Oreg., assignor to The
National Cash Register Company, Dayton,
Ohio, a corporation of Maryland

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4 Claims. (Cl. 197—133)

This invention relates to accounting, book-keeping and analogous machines and is directed particularly to the paper feeding mechanisms of such machines.

Many of the accounting machines used in present-day business systems are equipped with a laterally shiftable traveling carriage, similar to that used on typewriters, for presenting various types of record material to the printing means. Of the platen rolls of the traveling carriages of the machines referred to above, are revolved automatically each machine operation to line-space the material wound there around. Many business systems involve the use of a long journal sheet or a tally strip, upon which is printed all the entries for a certain business period; for example, in the case of auditing checking accounts by a bank, this period is usually one day. Under conditions of this kind, the journal sheet or tally strip remains in the machine during the entire run, while numerous ledger sheets or statement slips are being posted.

In order to facilitate the insertion and removal of the ledger sheets and statement slips, the traveling carriage is often of the front feed or automatic throat opening type, in which the platen roll is moved from printing position to front feeding position and the main pressure rollers are moved out of engagement with said platen roll to effect what is termed "opening of the throat." When the throat is open ledger sheets or statement slips may be inserted at the front of the platen and pushed directly to proper position, which is determined by a line finding device, after which closing the throat returns the platen to printing position and causes the main pressure rollers to engage the ledger or statement slips and hold them in contact with the platen roll.

As previously stated, the journal sheets or tally strips remain in the machine during a complete run, and are retained in contact with the platen roll, when the throat is open, by a plurality of auxiliary or overhanging pressure rollers, which remain in contact with the platen roll at all times, except when a filled journal sheet is being removed from the machine and a new one inserted therein. Quite often unequal pressure of the pressure rollers, irregularities in the journal sheet or defects in the platen roll may cause said journal sheet to run askew during the course of a protracted run, likewise continued releasing and reengaging of the main pressure rollers may cause the journal sheet to bulge and eventually skew off to one side or the other. Both of the above conditions cause annoyance to the oper-

ator and slow up the output of the machine, which in most cases is expected to turn out a predetermined quantity of work during a certain business period.

With the foregoing brief explanation in mind, it is broadly an object of this invention to provide means for improving the paper feeding mechanisms of machines of the type referred to above, so that work sheets or other long strips of record material will be accurately fed thereby.

A more specific object is the provision of means for rotatively urging the pressure rollers of the paper feeding device at a greater speed than the surface speed of the platen roll, so that there will be a constant pull upon the record material fed thereby, to effect accurate feeding of said record material.

Another object of this invention is to provide means to frictionally connect the pressure rollers of a paper feeding device to the shaft which supports them and to in turn operatively connect said shaft to the platen roll so that revolution thereof will cause said pressure rollers to tend to revolve at a speed greater than the surface speed of said platen roll to insure the proper feeding of long strips of record material.

With these and incidental objects in view, the invention includes certain novel features of construction and combinations of parts, the essential elements of which are set forth in appended claims and a preferred form or embodiment of which is hereinafter described with reference to the drawing which accompanies and forms a part of this specification.

In the drawing:

Fig. 1 is a perspective view, illustrating the mechanism constituting this invention, said mechanism including a platen roll, a plurality of pressure rollers associated therewith and non-positively driven thereby, and the record material fed by said platen and said pressure rollers.

Fig. 2 is a detail view of a modified form of pressure roller which embodies a different type of spring for frictionally connecting said pressure roller to the shaft which supports and drives it.

Fig. 3 is a detail view of the spring used in the modified form.

Description

The machine embodying the instant invention is provided with a laterally shiftable traveling carriage similar to that used on typewriters, for presenting various kinds of record material to the printing means. This traveling carriage supports the usual platen roll for feeding the record

material, and at the discretion of the purchaser, said platen roll may be provided with automatic throat-opening mechanism, which shifts said platen roll from printing to front feeding position, to facilitate the insertion or removal of record material, such as ledger sheets or statement slips.

In the majority of bookkeeping systems, each patron or customer has a ledger sheet upon which his individual account is posted, and in addition, all the accounts, for a certain business period, are printed in duplicate upon a tally strip or journal sheet, thus providing a permanent record, in duplicate, of all accounts, for future reference. In systems such as these, the ledger sheets are usually inserted in and removed from the open throat of the front feed platen while the tally strip or journal sheet and its superimposed carbon paper remain in place around the platen, being held against displacement by a plurality of overhanging pressure rollers, which remain in engagement with the platen roll when it is in either front feeding or printing position.

Often hundreds of ledger sheets are audited during a single business period, and as all the entries thereon are duplicated upon the journal sheet it is quite obvious that the journal sheet would have to be of considerable length in order to accommodate all such entries. After printing has been completed on each line, the platen roll is automatically revolved to line-space the ledger and journal sheets. In the case of the ledger sheet, where only a few lines at the most are printed upon, little trouble is experienced in the feeding thereof. However, in the case of the tally strip or journal sheet, where often many feet thereof are fed in this manner, any variation in the thickness of said journal sheet or any unevenness in the platen roll or pressure rollers has a tendency to make said journal sheet feed to one side and crowd into the paper guides and jam to such an extent that the feeding thereof is greatly hindered, or in some cases, altogether terminated. Moreover, the aging of the platen roll and the accompanying hardening of the surface thereof prevent said platen roll from properly gripping the paper to be fed thereby, which often results in serious irregularities in the feeding of said paper.

Again, opening and closing of the front feed throat and the accompanying releasing and engaging of the main pressure rollers may cause a slight bulge or slackness in the journal sheet, between the main pressure rollers and the auxiliary or overhanging pressure rollers, which likewise may seriously impair the feeding of said journal sheet. Likewise, the pressure rollers, which under the influence of spring tension hold the record material in resilient engagement with the platen roll, may, due to any distortion or sluggishness in revolving thereof, seriously impair the feeding of long strips of paper, such as journal sheets or tally strips.

In order to overcome the difficulties outlined above, the auxiliary or overhanging pressure rollers of the machine embodying the instant invention, in addition to being yieldingly retained in engagement with the surface of the platen roll, are rotatively urged in feeding direction at a speed greater than the surface speed of said platen roll. This insures the feeding of long strips of paper without any of the difficulties outlined above, and is therefore, believed to be a substantial advance in the art.

The paper feeding mechanism outlined above will now be described in detail.

The machine of the instant invention has a platen roll 10 (Fig. 1) supported by the framework of a traveling carriage of the type disclosed in Letters Patent of the United States No. 2,082,098, issued June 1, 1937, to R. A. Christian, and the co-pending application of R. A. Christian, filed January 27, 1933, Serial Number 653,838. The platen 10 is fast on a shaft 11, journaled in arms (not shown) supported by the traveling carriage framework, and said shaft carries a knob 12 at either end thereof, only one here shown, for manually rotating the platen roll. Secured on the left end of the platen roll 10 is a gear 13, slightly larger in diameter than said platen roll, the teeth of said gear meshing with a pinion 14, secured on the left-hand end of a pressure roller shaft 15. The shaft 15 is journaled in bushings carried by similar arms 16 and 17, pivoted respectively to brackets 18 and 19, secured on the top surface of a record material guide table 20, supported by the traveling carriage framework and adapted to guide record material underneath and around the platen roll 10.

Free on the shaft 15 are a plurality of pressure rollers 21, each roller retained between two compressible springs 22, which, in cooperation with their respective adjustable collars 23, frictionally connect said pressure rollers 21 to said shaft 22. The collars 23 are held in place on the shaft 15 by means of set screws, thereby providing a means for varying the tension of the springs 22, to obtain the proper frictional connection between said shaft 15 and the pressure rollers 21. Springs 24 and 25, connected between the arms 16 and 17, and their respective brackets 18 and 19, urge said arms and the shaft 15 counterclockwise or downwardly to maintain the pressure rollers 21 in yielding engagement with the surface of the platen roll 10, and to retain the pinion 14 in mesh with the gear 13.

One form of record material used in the present machine is a wide tally strip 26, a supply roll 27 of which is supported by a reel 28, mounted between end plates 29 and 30 of the tally roll framework, said end plates being supported by the cross rods 31 and 32, in turn supported by the traveling carriage framework, and by a tearing blade 33, the bent-over ends of which are secured to said plates 29 and 30.

The web of the tally strip 26, guided by the table 20, is first threaded underneath and around the platen roll 10, then between the pressure rollers 21 and the surface of said platen roll, and finally underneath the rod 32 and the tearing blade 33. The arrow indicates the direction of feed of said tally strip.

The gear 13 (Fig. 1) being larger in diameter than the platen roll 10, and the pinion 14 being smaller in diameter than the pressure rollers 21, have a tendency, upon rotation of said platen roll 10, to revolve the pressure rollers 21 at a greater speed than the surface speed of said platen 10. This results in a gain or take-up movement of said pressure rollers, which immediately takes up any slack in the web of the tally strip 26, and very effectively assists in the feeding of said tally strip by said platen roll. The frictional or non-positive feeding movement of the pressure rollers 21 likewise compensates for any irregularities in the surface of the platen 10 or in the pressure rollers themselves, thus effecting accurate and positive feeding of long por-

tions of said tally strip 26 without any tendency whatever to slip, jam, buckle or skew to one side.

Journal sheets are used in a similar manner to the tally strip 26, the only difference being that the journal sheets are usually much wider than the tally strip, sometimes being the full width of the platen, and instead of being contained in a supply roll are usually manifolded in accordion fashion and fed from a supply source, around the platen roll, and into a receptacle. As a rule, both the tally strip 26 and the journal sheets have their superimposed carbon paper, so that all entries made upon the various ledger sheets or statement slips will be duplicated thereon.

Modified form of pressure roll

Fig. 2 illustrates a modified form of pressure roller, the only difference between this form and the preferred form being the method of applying the spring tension between the pressure roller and the shaft which supports it, to frictionally connect these parts. Referring to Fig. 2, a pressure roller 34, similar in every respect to the pressure rollers 21 of the preferred form, is integral with a bushing 35, having fast in each end thereof similar rings 36, which in cooperation with a pressure roller shaft 38, similar in every respect to the shaft 15 of the preferred form, form a bearing for said pressure roller 34. Split retaining rings 37, in cooperation with grooves in the shaft 38, retain the pressure roller 34 in proper location on said shaft. While only one is here shown and described, there are several of the pressure rollers 34 spaced at regular intervals along the shaft 38.

Referring to Figs. 2 and 3, frictional engagement is maintained between the pressure roller 34 and the shaft 38 by a formed spring 39, which fits between said shaft and the bushing 35 in a cavity or recess formed by the rings 36 and said bushing 35. The spring 39 may easily be adjusted to obtain the proper frictional engagement between the pressure roller 34 and the shaft 38, or as an alternative more than one spring may be used to obtain the proper degree of friction.

The modified form shown in Figs. 2 and 3, in effect produces the same results as the preferred form with the advantage that there are no exposed coil springs to collect dust and erasing crumbs, and there are no exposed spring ends which may interfere with the feeding of the record material, or injure the operator's hands; this latter possibility occurring when it is necessary for the operator to move the pressure rollers out of engagement with the platen 10 by grasping the shaft 15 and swinging said shaft and the arms 16 and 17 over in a clockwise direction in order to replace the tally strip or journal sheet.

It will be observed that the pinion 14 is yieldingly maintained in engagement with the gear 13 by the action of the springs 24 and 25, thus providing a valuable safety feature which permits said pinion 14 to ride out of the teeth of the gear 13 in case some foreign substance is accidentally or inadvertently caught between said teeth, thereby eliminating the possibility of damage to either the foreign substance or the pressure roller mechanism.

While the form of mechanism herein shown and described is admirably adapted to fulfill the objects primarily stated, it is to be understood that it is not intended to confine the invention to the one form or embodiment herein disclosed, for it is susceptible of embodiment in various

forms all coming within the scope of the claims which follow.

What is claimed is:

1. In a machine of the character described, the combination of a revoluble platen roll; a plurality of pressure rollers, which, in cooperation with the platen roll, form a means for feeding record material; a shaft to rotatably support the pressure rollers; spring members forming a frictional connection between each of the pressure rollers individually and the shaft; a gear connected to the platen roll, the pitch diameter of said gear larger than said platen roll; a pinion connected to the shaft, the pitch diameter of said pinion smaller than the pressure rollers; and means to yieldingly maintain the pinion in mesh with the gear and the pressure rollers in contact with the platen, so that rotation of said platen roll will yieldingly urge said pressure rollers individually to rotate in a feeding direction, at a speed greater than the surface speed of said platen roll to facilitate the feeding of long strips of said record material.

2. In a machine of the class described, the combination of a revoluble platen roll for the feeding of record material; a shaft; a plurality of pressure rollers, each having a bushing integral therewith for rotatably supporting said pressure roller on the shaft, each of said bushings having a relieved portion adjacent to said shaft; a formed spring member, one or more of which is adapted to fit in each of the relieved portions of a bushing to form a frictional connection between the shaft and the associated pressure roller; means, including a gear integral with the platen roll and a pinion integral with the shaft, whereby rotation of said platen roll rotates the shaft which in turn, by means of the frictional connection, tends to urge each of the pressure rollers individually to rotate at a greater speed than the surface speed of the platen roll to insure proper feeding of the record material; and yieldable means to retain the pinion in mesh with the gear and to retain the pressure rollers in contact with the platen roll.

3. In a machine of the class described, the combination of a revoluble platen roll to feed record material; a shaft; a gear connected to the platen roll; a pinion connected to the shaft and adapted to mesh with the gear; a plurality of pressure rollers, comprising bushings integral therewith for rotatably supporting said pressure rollers on the shaft; a relieved portion in each of the bushings forming annular cavities between each of said bushings and the shaft; a formed spring adapted to be retained in each of the cavities to effect a frictional connection between the shaft and the pressure rollers; and yieldable means to retain the pinion in mesh with the gear and to retain the pressure rollers in contact with the platen roll, whereupon feeding movement of said platen roll, due to the ratio of the gear and the pinion causes the shaft to urge each of the pressure rollers individually to rotate in a feeding direction at a speed greater than the surface speed of the platen roll to insure proper feeding of the record material.

4. In a machine of the character described, the combination of a rotatable platen roll; a shaft; a plurality of pressure rollers, each having a bushing integral therewith for rotatably supporting said pressure roller on said shaft; a relieved portion in each of the bushings, each of said relieved portions forming a cavity between the shaft and the associated bushing; springs formed

out of flat stock, one or more of said springs adapted to fit in each of the cavities to form a frictional connection between the shaft and the associated pressure roller; resilient means to hold the pressure rollers in contact with the platen roll to form a feeding means for record material; and means, effective upon rotation of the platen

roll, to drive the shaft at the proper speed to non-positively urge each of the pressure rollers individually to rotate in a feeding direction at a speed greater than the surface speed of the platen roll to insure the proper feeding of long strips of said record material.

CLARENCE J. IRA.