

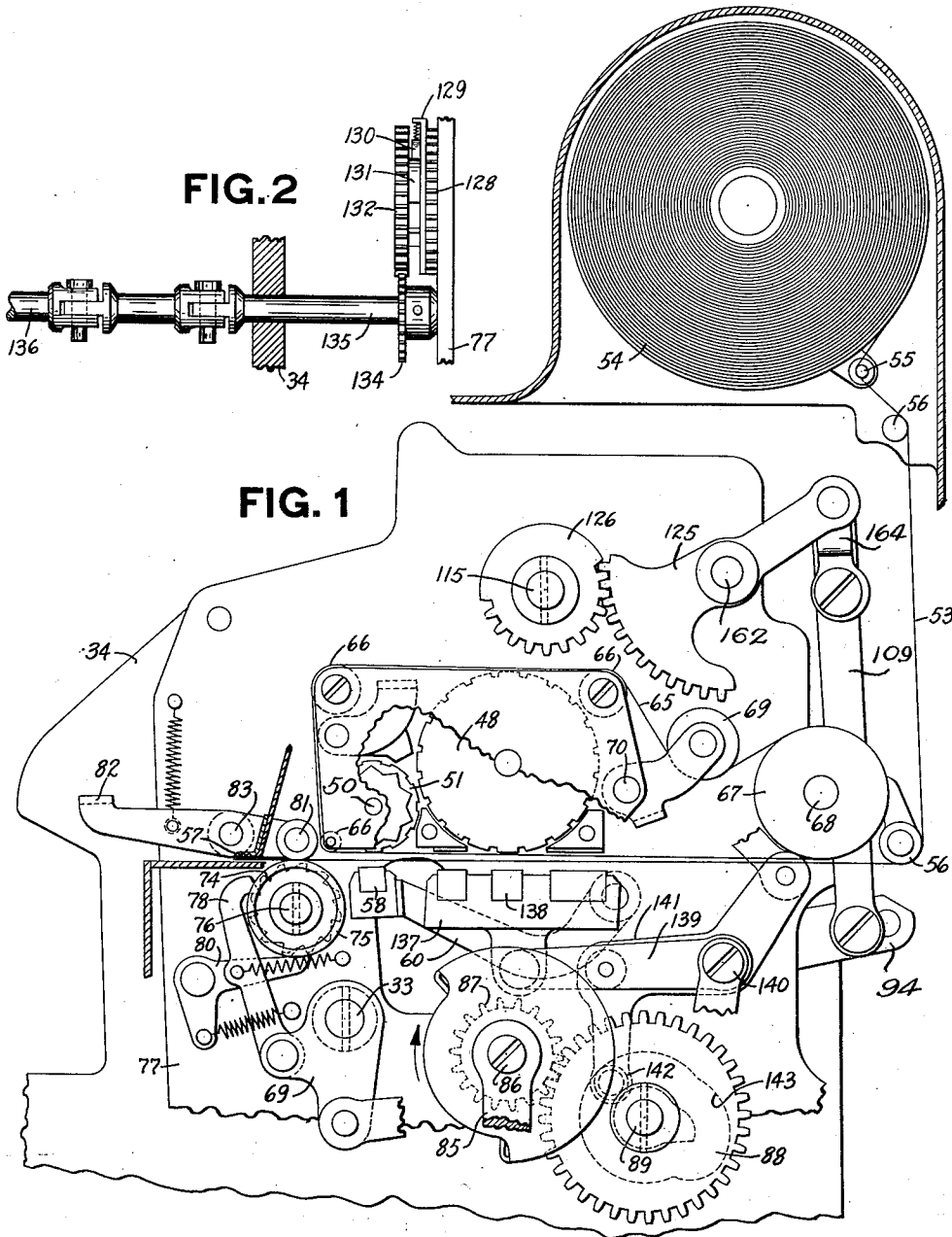
Nov. 20, 1934.

E. J. VON PEIN

1,981,256

CASH REGISTER

Original Filed April 23, 1920 3 Sheets-Sheet 1



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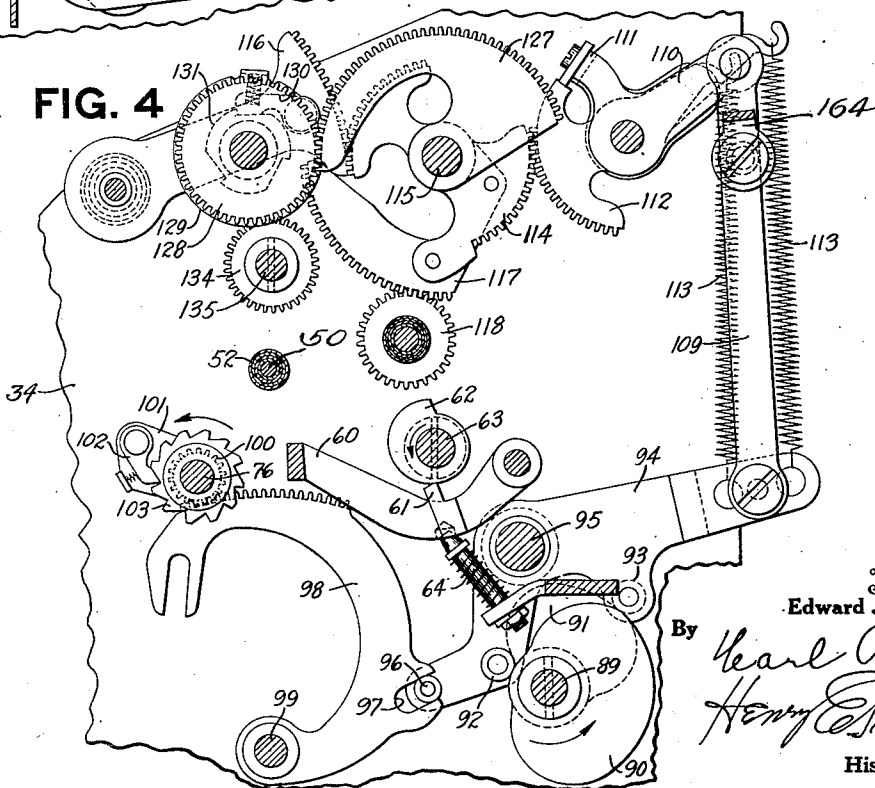
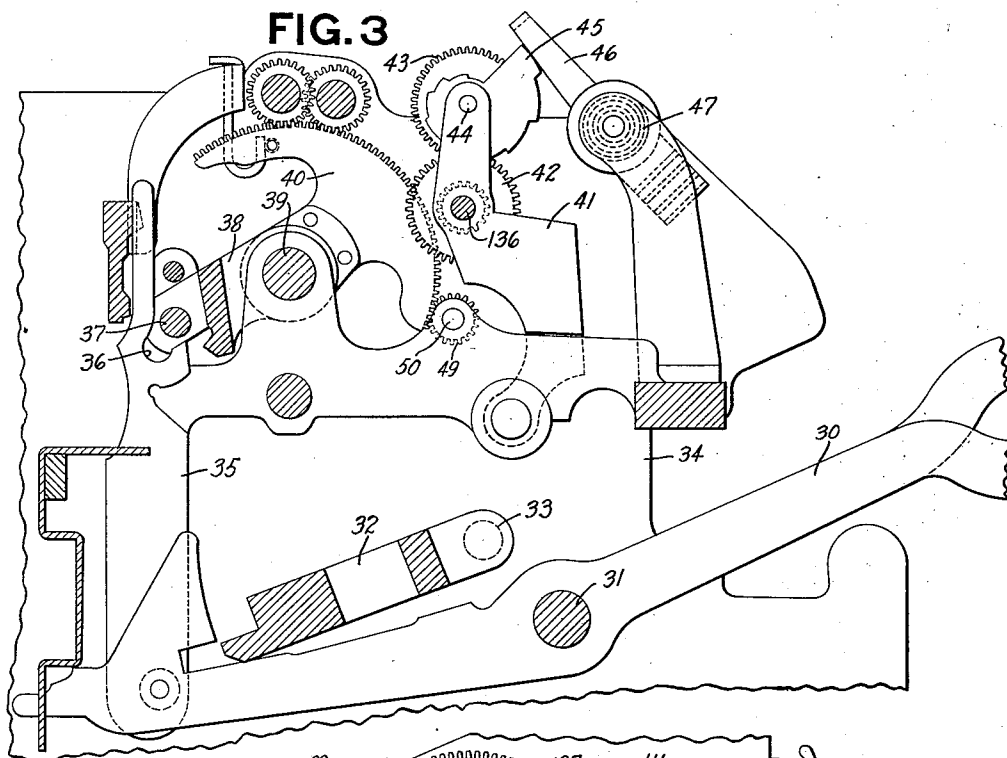
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UNITED STATES PATENT OFFICE

1,981,256

CASH REGISTER

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Original application April 23, 1920, Serial No.
376,088. Divided and this application April 16,
1926, Serial No. 102,502

9 Claims. (Cl. 271—2.4)

This invention relates to improvements in paper slackening mechanism adapted for use with cash registers and like machines.

The subject matter of this application constitutes a division of Letters Patent of the United States, No. 1,761,548, issued on June 30, 1930.

The principal object of this invention is to provide a paper slackening device whereby the retarding tension on the paper is relieved to permit the feed rollers to issue the proper length receipt.

With this and incidental objects in view, the invention consists of 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 drawings which accompany and form part of this specification.

Of said drawings:

Fig. 1 is a view in side elevation of the printer.
Fig. 2 is a front view of a part of the turn-to-zero mechanism, shown in Fig. 4.

Fig. 3 is a transverse sectional view of the machine.

Fig. 4 is a cross-sectional view taken just inside the printer frame, and shows the mechanism for setting the type during total-printing operations.

Fig. 5 is a detail view, in side elevation, of the paper slackening mechanism.

Fig. 6 is a view in rear elevation of the mechanism shown in Fig. 5.

In general

Described in general terms, the machine comprises a series of manipulative devices, such as keys, which operate mechanism for entering items on a totalizer, and for setting up type characters for printing the item upon an issuing receipt or other record material. The keys are arranged upon a shaft and are similarly operated, each key imparting a characteristic movement to actuate devices which, in turn, actuate the elements of the totalizer in accordance therewith, and also set type carriers from which an impression is taken upon a record strip. The totalizer is provided with scroll disks which control the setting of total type characters for printing the total standing on the totalizer upon the record strip. The record strip, upon which the impressions are made, is fed from a supply roll by a pair of feed rollers which are resiliently held together for feeding the paper. These rollers are operated to feed the paper at a greater velocity

and for a greater distance when printing totals than when printing items and therefore, the possibility of the feed rollers slipping and thus failing to feed the requisite length of strip is greater during total-printing operations. To avoid this slippage, thereby insuring uniform receipts, a novel device is provided for unwinding enough paper from the supply roll before the feed rollers become effective, to relieve the feed rollers from the retarding drag or inertia of the paper feed roll on the web.

Item entering mechanism

The keys 30 (Fig. 3) are pivoted upon a transverse shaft 31, and at their rear ends engage and operate the usual key coupler 32 which is provided with trunnions 33 pivotally mounted in the side frames 34 of the machine. The rear end of each key 30 carries an actuator controller 35, provided at its upper end with a slot 36 adapted, when the key 30 is operated, to engage a transverse rod 37 carried by a rocking actuator frame 38 pivoted on a transverse rod 39, to rock said frame a distance commensurate with the value of the key 30 depressed. The slots 36 are of different depths corresponding to the values of the keys 30. There is an actuator frame 38 for each denominational group of keys 30, but only one is here disclosed. Each frame has attached to it an actuator 40 (Fig. 3).

Totalizers

The totalizer is mounted on a pivoted frame 41 and comprises a plurality of rotatable elements 42, each appropriate to a numerical order, as is usual in these devices. When the totalizer frame 41 is rocked by depression of the keys 30, to engage the totalizer with the actuators 40, the rotatable elements 42, through pinions connected to each at the elements, will be caused to rotate distances corresponding to the values of the keys depressed. The totalizer elements 42 mesh with gears 43 rotatable on a shaft 44 mounted in brackets carried by the rocking totalizer frame 41. Moving with each gear 43 is a scroll disk 45. Feeler fingers 46 mounted on telescopic sleeves 47, are brought into contact with the scroll disks 45 to position total printer wheels 48 (Fig. 1) to print the amount accumulated on the totalizer, by means of mechanism later set forth.

Item type setting

Each of the actuators 40 (Fig. 3) meshes with a pinion 49. One of these pinions 49 is fast on the left-hand end of a shaft 50, while the other

pinions are mounted upon the left hand ends of telescopic sleeves 52 (Fig. 4), which extend to the right and, on their right-hand ends, carry item printing wheels 51 (Fig. 1) for printing the items of the transactions on the receipt or record strip 53.

The receipt strip 53 (Figs. 1, 5 and 6) is fed from a supply roll 54, around a rod 55 and guide rollers 56 to a severing plate 57. The strip passes between the item type carriers 51 and a platen 58, so that when the platen is operated, an impression will be made thereon.

Item printing

The platen 58 is operated by the following mechanism. Integral with a platen-carrying arm 60 (Figs. 1 and 4), is a projection 61, with which cooperates a cam 62 fast on a drive shaft 63. This drive shaft is given a complete rotation during each item entering operation, by a double rack not shown herein, but which is shown in the parent patent. As the cam rotates, it rocks the platen-carrying arm 60 counter-clockwise (Fig. 4) against the action of a spring-pressed plunger 64, supported in an extension of the machine frame. As the high portion of the cam 62 passes the projection 61 of the platen-carrying arm 60, the spring plunger 64 will rock the platen-carrying arm rapidly clockwise thereby bringing the platen 58 into contact with the strip below the item type wheels 51 and press the strip thereagainst with sufficient force to take an impression therefrom on the record strip 53.

Inking ribbon

To secure a visible impression, a suitable continuous inking ribbon 65 (Fig. 1) is wound around guide rollers 66, mounted in the printer frame 77, and over an inking roller 67 mounted upon a stud 68 projecting from the printer frame. This ribbon 65 is held taut by a tension roller 69 supported in a rocking frame mounted upon a rod 70 pivoted in the printer frame 77. The ribbon 65 is fed at each operation of the recording keys 30 by means shown in the parent patent.

Receipt strip feed for item printing

The receipt strip 53 is fed by a feed roller 75 (Fig. 1) secured on a shaft 76 journaled in the printer frame 77. Also secured to the shaft 76 is a ratchet wheel 74, which is engaged by a spring-controlled pawl 78 pivoted on an arm 69, secured on the right-hand key-coupler trunnion 33. By this means, depression of an amount key 30 will operate the pawl 78 to rotate the feed roller 75 counter-clockwise and feed the leading end of the strip out of the machine. A spring-controlled retaining pawl 80 prevents retrograde motion of the feed roller 75.

Directly above the feed roller 75, and in contact with the same, is a tension roller 81 carried by a spring-controlled, manually operable lever 82 pivoted on a stud 83 mounted in the printer frame 77. As the receipt strip 53 passes between the feed roller 75 and the tension roller 81, it will be fed toward the front of the machine step by step to space the items printed at each operation of a key 30.

Receipt strip feed for total printing

The total-printing crank 85 (Fig. 1), which primarily serves as an actuator in connection with the printing of a total, is freely mounted upon a stud 86 supported in the frame 77, and is given

two rotations in a clockwise direction during each total printing operation. The crank 85 is connected by a flexible device, with a gear 87 which meshes with the gear 88 fastened on a driving shaft 89, as shown in the parent patent.

The mechanism for imparting additional movement to the feed roller 75, when printing totals, is the same as that shown in an application of Von Pein, Serial No. 293,141, filed April 28, 1919, and is, briefly, as follows:

Fast upon the shaft 89 are two cams 90 and 91 (Figs. 4 and 5) which impart an oscillatory motion to a rocking lever 94 by contact with anti-friction rollers 92 and 93, carried on studs mounted on opposite sides of the fulcrum of the lever 94 which, in turn, is pivoted upon a shaft 95. Carried by the forward end of the rocking lever 94 is an anti-friction roller 96 entered in a slot 97 in a segmental arm 98 (Fig. 4) pivoted upon a stud 99 mounted in the adjacent side frame 34, and meshing with the pinion 100 fast to an arm 101 freely mounted upon the feed roll shaft 76. The arm 101 carries a spring-controlled pawl 102 engaging a ratchet wheel 103 which is fast on the feed roll shaft 76, to which is attached the receipt strip feeding roller 75, previously described. Thus when the crank 85 is turned, the arm 101 will be rocked, thereby rotating the feed roller 75 to advance the record material a greater distance than it is fed by the depression of a key 30.

Total-printing type wheels

The total-printing wheels 48 (Fig. 1), which are positioned under the control of the feeler fingers 46 (Fig. 3) contacting the scroll disks 45 during the rotation of the crank 85, are twice the diameter of the item-printing wheels 51, and contain two sets of type characters arranged in tandem, one set for printing upon the receipt strip, and the other for printing upon a detail record which is not shown herein.

The crank 85 operates the feeler fingers 46 to set the total printing wheels 48, as follows:

Secured to the rocking lever 94 is a link 109 (Fig. 4), the upper end of which is connected to an arm 110 of a restraining and restoring bail 111 extending across a series of segments 112 which are constantly urged in a clockwise direction by springs 113 attached thereto and to the forked rear end of the rocking lever 94. These segments 112 mesh with double segments 114 loose on the shaft 115, which, in turn, mesh with segments 116 attached to the telescopic sleeves 47, to which the feeler fingers 46 cooperating with the scroll disks 45 are secured. Each of the double segments 114 carries a segment 117 which meshes with a gear 118 carried by one of the telescopic sleeves to which the total printing type wheels 48 are secured. It is obvious that the amount of movement that the springs 113 transmit to the total printing type wheels 48 is determined by the amount of movement imparted to the feeler fingers 46 to contact them with the scroll disks 45, which movement is determined by the angular positions of the scroll disks 45.

The totalizer is turned to zero by means of the following mechanism. The link 109 is connected by a link 164 to a segment 125 which meshes with a mutilated gear 126 (Fig. 1) secured to the shaft 115 which, through a segment 127 (Fig. 4), oscillates a gear 128 (see also Fig. 2), to which is rigidly secured a disk 129 carrying a spring-pressed pawl 130 cooperating with a ratchet 131. This ratchet is carried by a gear 132 in mesh with a gear 134 (Fig. 2), fast on a shaft 135 operatively

connected to the totalizer turn-to-zero shaft 136, by a short shaft and two universal joints. It is apparent, therefore, that motion will be transmitted to the totalizer turn-to-zero shaft 136 to restore the totalizer elements 42 to zero during each total-printing operation, shortly after the total impression has been taken.

Total printing

At the proper time, and by the operation of the crank 85, a platen-supporting block 137 (Fig. 1) will be raised, bringing a platen 138 into contact with the total printing type wheels 48. The platen supporting block 137 is pivotally mounted upon an arm 139 pivoted upon a stud 140 which projects from the printer frame 77. Secured to the arm 139 is a bell crank 141 having a downwardly extending arm which carries a roller 142, entered in a cam slot 143, cut in the side of the gear 88.

Paper slackening device

During total-printing operations, the feed and tension rollers 75 and 81 are operated faster and are turned a greater distance than during item entering operations. In order to relieve the paper feed rollers, during total-printing operations, of the load incident to pulling off an extra amount of the paper web from the paper roll, which, of course, would necessitate turning the comparatively heavy paper roll simply by the grip of the paper feeding rollers on the web, means is provided to produce slack in the receipt strip, previous to the feeding of said strip. This is accomplished by rocking a plate 150 (Fig. 5) which is freely mounted upon a stud 151 projecting laterally from the supply roll housing 152. The plate 150 has two concentric slots 153 and 154 into which are fitted guide screws 155 and 156, respectively, which limit the swinging motion of plate 150. An arm 149 extending downwardly and rearwardly from the plate 150, carries the pin 55 around which the paper web 53 passes as it leaves the supply roll 54. Obviously, by rocking the plate 150 in clockwise direction (Fig. 5) at a time when the forward end of the paper web or strip is gripped between the feed rolls 75, 81, the pin 55, extending across the web at a point beyond the circumference of the paper roll and between it and the guide 56, will press against the web, and as the forward length of the web will not yield materially, tension is exerted on that portion of the web between the slack-forming pin 55 and the paper roll to turn the roll and form a slack loop in the web at this point.

The plate 150 receives its motion from the rocking lever 94. A link 158 is pivoted at one end on a stud 159 secured in the plate, and at its lower end on a stud 160 secured in an arm 161. The link 109, connected at its lower end to a stud 166 on the lever 94, and at its upper end to the segment 125, through the supplementary link 164, communicates motion from the lever 94 to the segment 125. The arm 161 is loosely mounted on shaft 162 to pivot thereon and has an extension which reaches over and above the supplementary link 164 attached to the link 109. A tension spring 167 is secured at one end to this extension and at the other end to the lever 94. This spring tends to keep the arm 161 in contact with the supplementary link 164. As the lever 94 moves down and up under the action of its cam 90, it communicates movement through link 109 to segment 125 and through the arm 161 and link 158 to the plate 150. Movement of the plate 150 is

limited by the screws 155 and 156, whereas movement of the segment 125 is determined by the movement of the lever 94. By reason of the spring connection 167 between the lever 94 and the arm 161, the arm 161 is not forced to make the complete movement with the segment 125. Thus, while the plate 150 derives its motion from the lever 94, the extent of its movement is dependent upon the length of the slots 153 and 154, any excess movement of the segment 125 over that necessary to give this movement to the plate 150 being accommodated by the spring 167.

It can be seen from Figs. 4 and 5 that the receipt strip is pulled off the roll 54 as the lever 94 moves clockwise, and that the paper so pulled off is released to be fed out of the machine upon the return counter-clockwise movement of the lever 94 and rocking plate 150 after the total impression has been effected by the cam 143 shown in Fig. 1. The feed rollers 75 and 81, during their long feed operation in total-printing operations, therefore, do not unwind the paper from the supply roll, but merely feed the slack paper previously pulled off the supply roll. The receipt strip will, therefore, be fed the same extent during each total-printing operation.

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 class described, in combination with feed means for record material; and a plurality of actuating means for the feed means; of a slackening device associated with certain of the actuating means to slacken the record material before the associated actuating means actuates the feed means.

2. In a machine of the class described, in combination with a support for a roll of record material; record material feed means; and a plurality of actuating means for the feed means; of a slackening device pivoted concentrically with the record material roll support; and connections associated with certain of the actuating means to operate the slackening device.

3. In a machine of the class described, the combination with a support for a record material roll; and record material feed means; of a slackening device pivoted concentrically with the record material roll support; and resilient actuating means for the slackening device to withdraw a certain amount of material from the roll before the material is fed.

4. In a machine of the class described, the combination with a support for a record material roll; and record material feed means; of an oscillating plate pivoted concentrically with the record material roll support; a device on the plate cooperating with said record material; and resilient means to oscillate the plate to cause the device to withdraw record material from the roll to relieve the feed means.

5. In a machine of the class described, the combination with means to feed record material from a supply roll; of oscillatory means mounted in axial alinement with said roll, said means having apertures; means cooperating with the apertures to limit the oscillatory means in its movement; a device supported by the oscillatory means adapted when operated to draw record material

from the supply roll to produce a slack in the web of material; a link member attached to the oscillating means; and means to drive the link to operate the oscillating means.

- 5 6. In a machine of the class described, the combination of a support for a record material roll; record material feed means; a slackening device to withdraw material from the roll before the material is fed; means, including a lever to control the operation of the slackening device; a
10 spring to form a resilient connection between the slackening device and the lever, the lever adapted to move farther than the slackening device; and means to determine the distance the slackening device moves.
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7. In a machine of the class described, the combination of a support for a record material roll; record material feed means; a spring actuated slackening device to withdraw record material
20 off of the roll, said device having apertures; and

means cooperating with the apertures to limit the spring actuated movement of the device.

8. In a machine of the class described, the combination of a support for a record material roll; record material feed means; a spring actuated
80 slackening device to withdraw record material off of the roll; a controlling arm to maintain the device in its normal position; and a lever for actuating the controlling arm to release the device to the action of its spring.
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9. In a machine of the class described, the combination of a support for a record material roll; record material feed means; a device to withdraw record material off of the roll; a controlling arm to maintain the device in its normal position; a
90 lever to actuate the arm to release the device; and a spring between the device and the lever to actuate the device when the lever moves the controlling arm.

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