

Jan. 7, 1958

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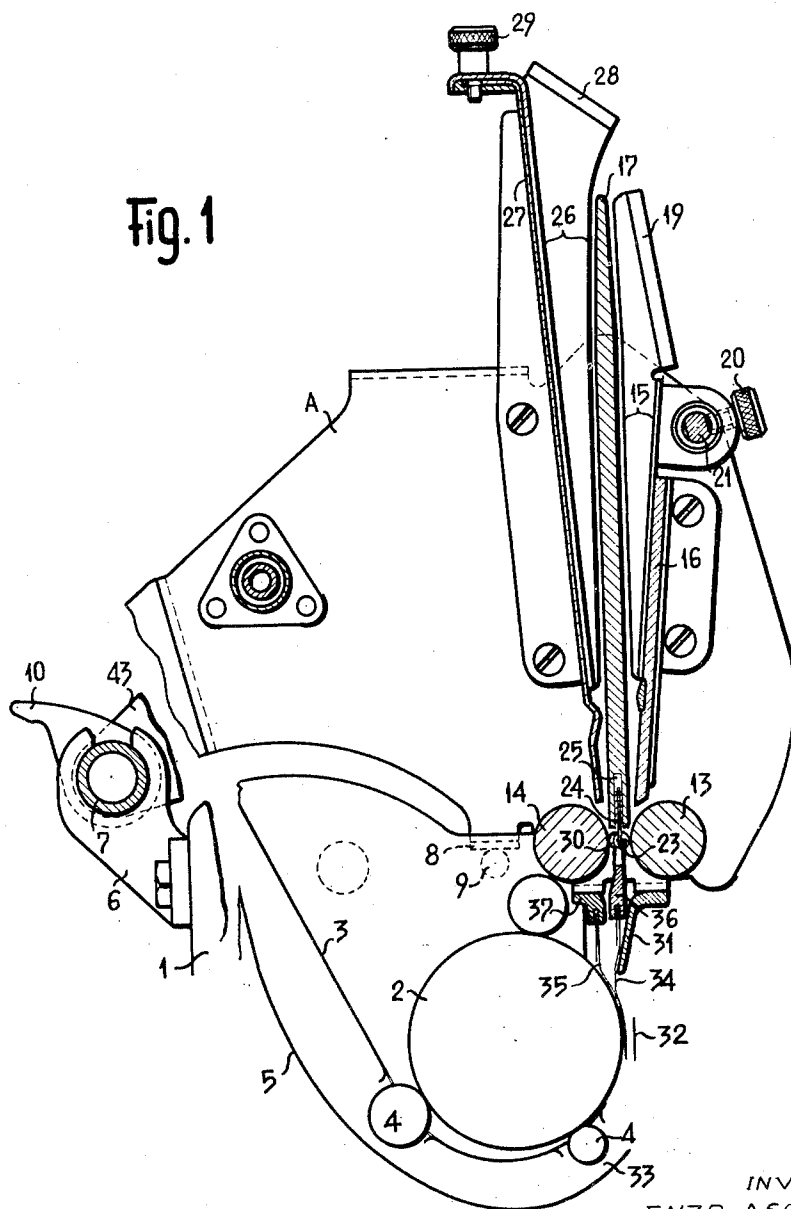
2,818,960

ACCOUNTING APPARATUS FOR APPLICATION TO TYPEWRITERS OR THE LIKE

Filed March 2, 1955

6 Sheets-Sheet 1

Fig. 1



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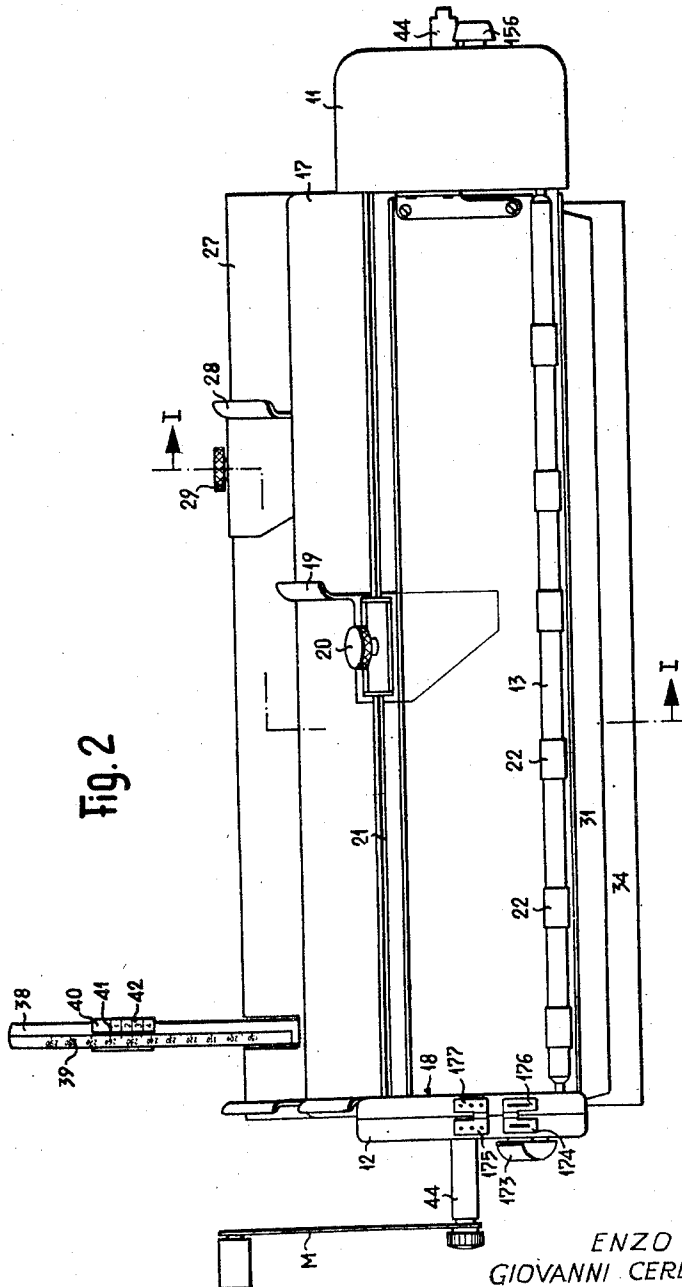
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6 Sheets-Sheet 2



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6 Sheets-Sheet 3

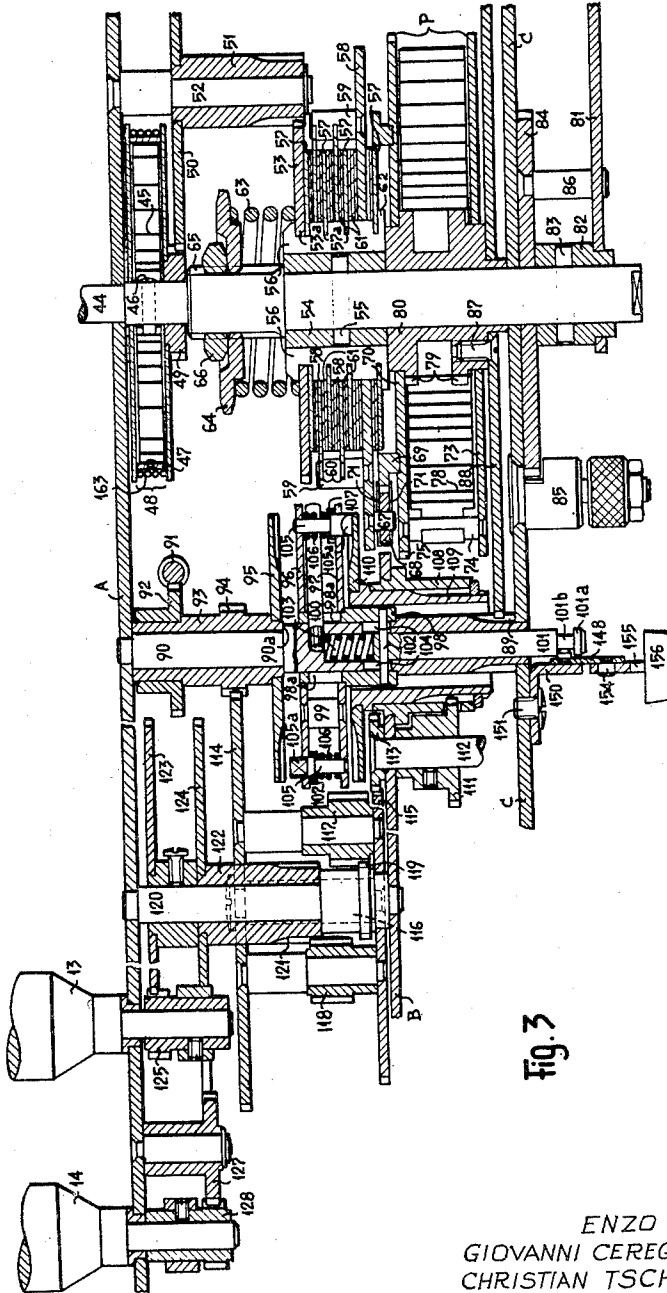


Fig. 3

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6 Sheets-Sheet 4

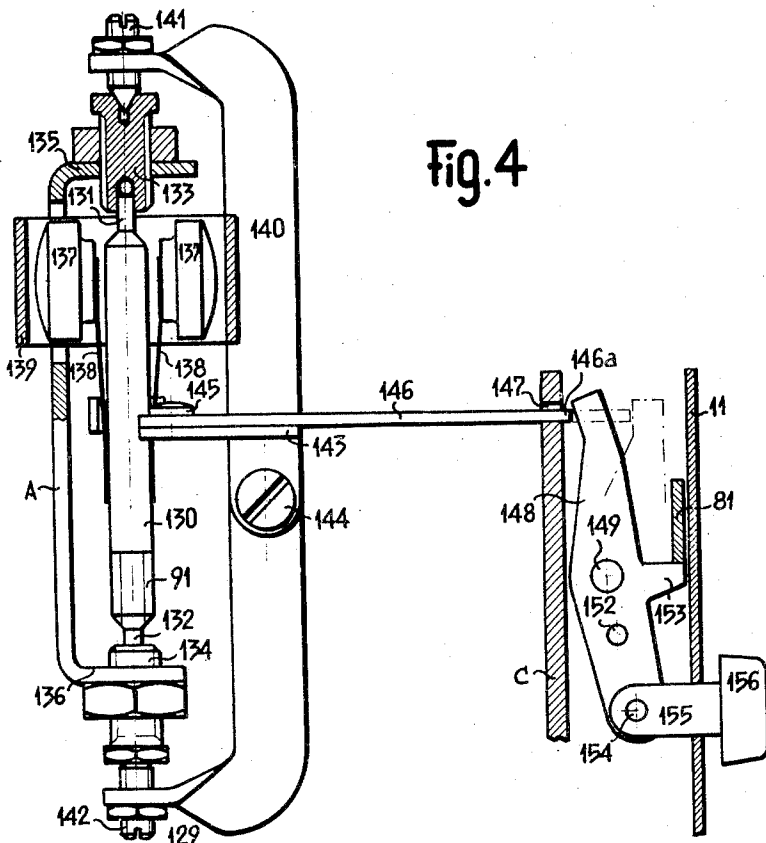


Fig. 4

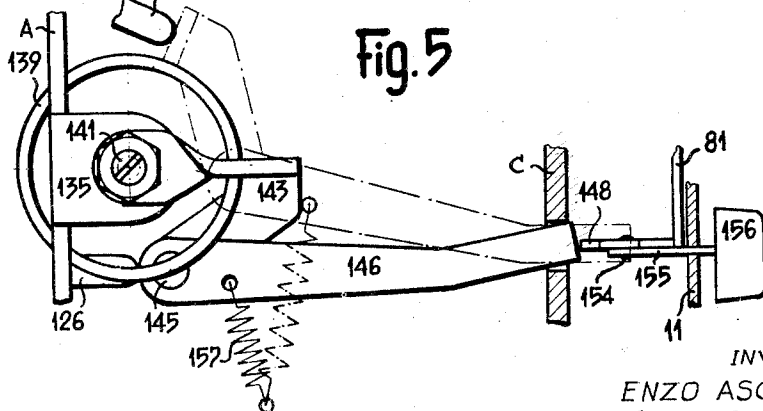


Fig. 5

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6 Sheets-Sheet 5

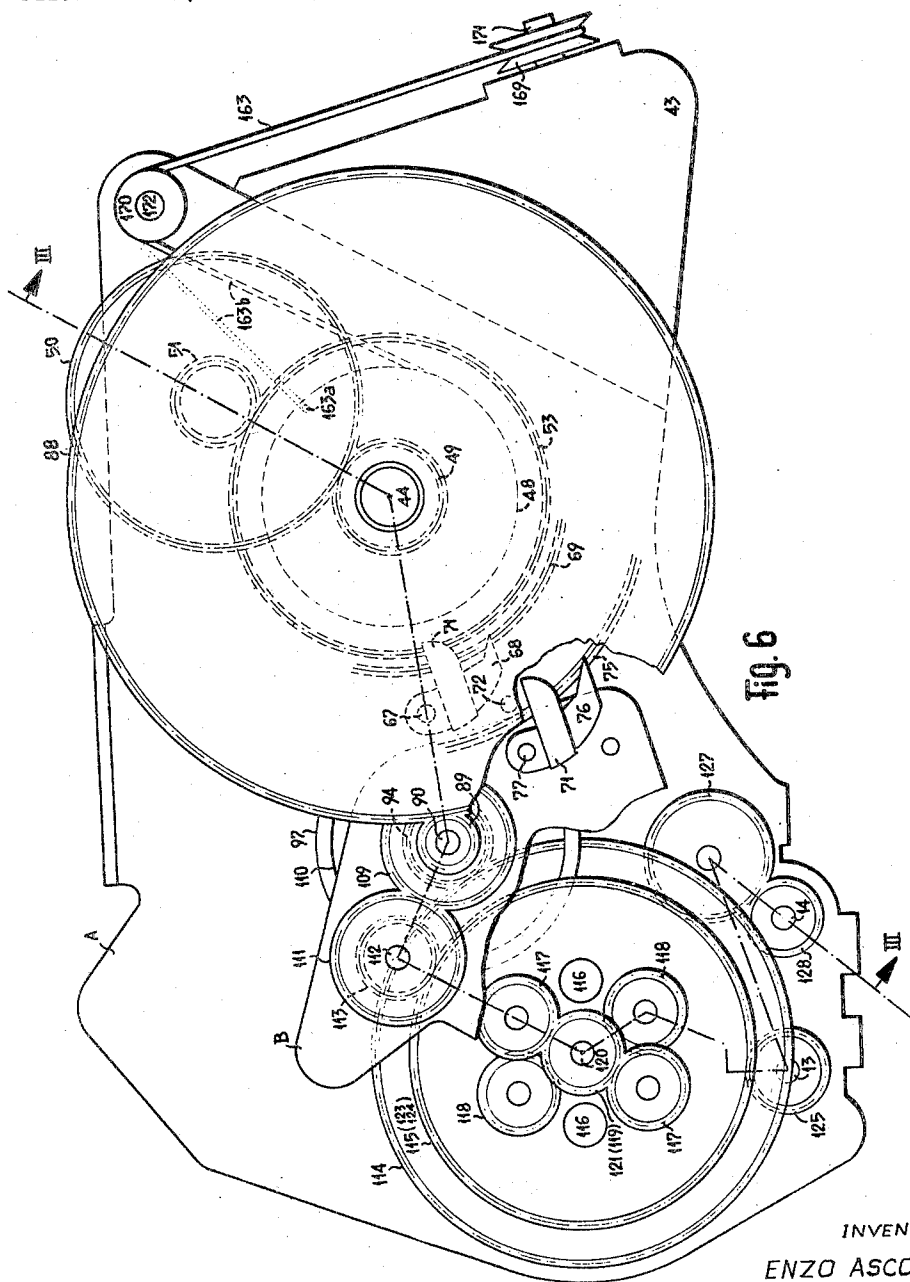


Fig. 6

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ACCOUNTING APPARATUS FOR APPLICATION TO TYPEWRITERS OR THE LIKE

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6 Sheets-Sheet 6

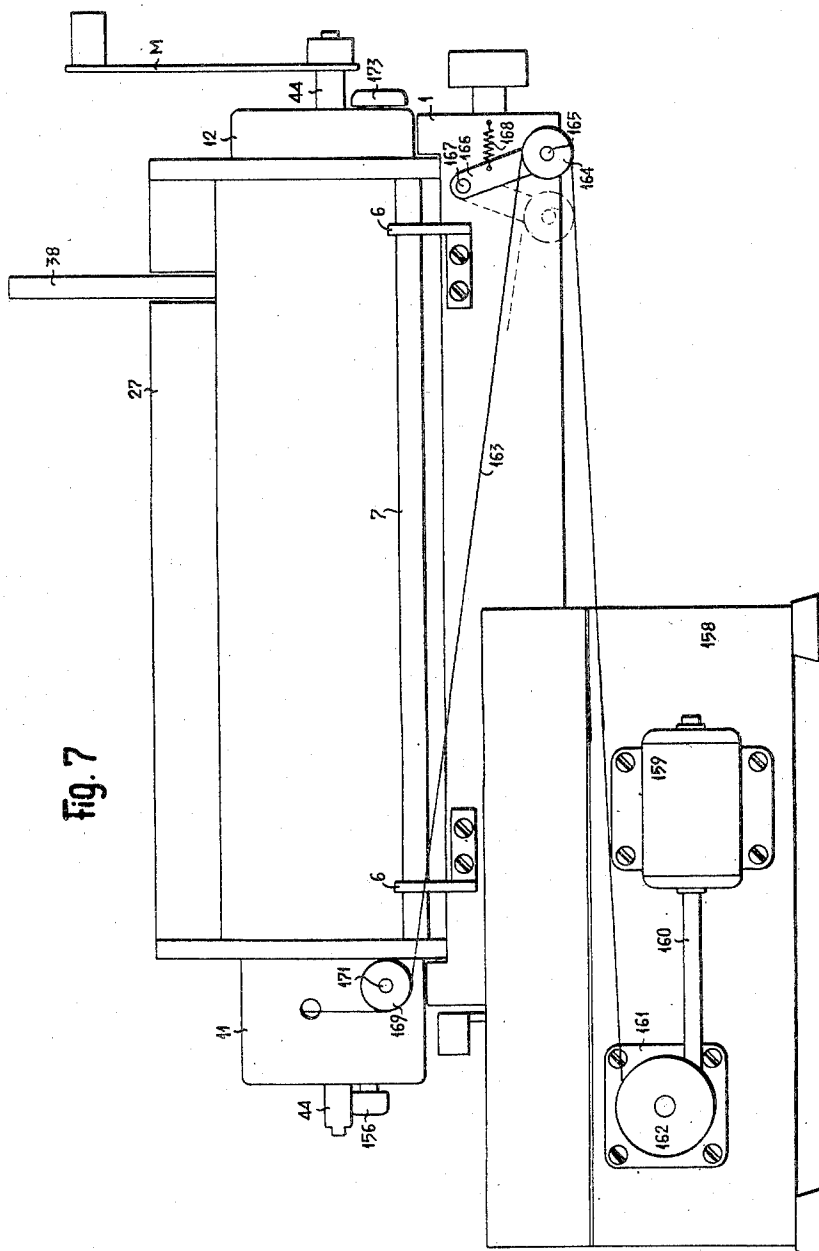


Fig. 7

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ACCOUNTING APPARATUS FOR APPLICATION TO TYPEWRITERS OR THE LIKE

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Application March 2, 1955, Serial No. 491,732

Claims priority, application Switzerland March 2, 1954

9 Claims. (Cl. 197—128)

The present invention relates to an account typing apparatus adapted to be mounted on the carriage of an office machine, particularly a typewriter, allowing of the automatic introduction of at least one account card driven by a roller driving device.

Apparatus of this type are known, but have certain disadvantages of which the principal ones are enumerated hereinafter:

(1) The introduction of cards, when the apparatus is provided for the introduction of more than one card, cannot be carried out simultaneously, but the cards must be introduced one after the other by two successive operations of a control member.

(2) As the introduction of the cards is effected directly by the manual control member, considerable attention must be devoted to the operation of the latter, for avoiding tear of the perforations of the cards and their sliding relatively to the driving device, which may result in the case of brutal operation.

(3) The necessity for a motor mechanism entirely separate for each card to be introduced.

(4) The necessity for a supplementary motor for each card to be introduced when the apparatus is controlled electrically.

The invention tends to remedy the above-mentioned disadvantages and has for its subject an accounting apparatus which is distinguished from known apparatus by the fact that it comprises a device for reversing the direction of rotation enabling a single drum to drive all the rollers of the said driving device in two directions of rotation, the rewinding of the barrel spring being effected through the medium of a friction device, a governor being provided for controlling the speed of expansion of the said spring.

One form of construction of an apparatus according to the invention is shown diagrammatically and by way of example in the accompanying drawings, wherein:

Fig. 1 is a section on the line I—I of Fig. 2, with a portion of the carriage in elevation.

Fig. 2 shows a front view of the apparatus.

Fig. 3 is a section of the motor mechanism on the line III—III of Fig. 6.

Figs. 4 and 5 show the speed governor in elevation and in plan.

Fig. 6 is an elevation of the motor mechanism with parts removed or broken away for facilitating the reading.

Fig. 7 is a rear view of the apparatus mounted on the carriage of a typewriter.

As will be seen in Fig. 1, the apparatus is mounted on a carriage 1 of a typewriter provided, in the usual manner, with a platen 2, a paper guiding plate 3 and rollers 4. The carriage also comprises a second plate 5 provided for guiding the account cards introduced by the apparatus. Two forked supports 6, secured rigidly to the carriage 1, are provided for receiving a rod 7 secured at its two ends to two plates A with which the apparatus is provided. In this manner the rod 7, pivoting in the forked supports 6, enables the apparatus to occupy two positions relatively to

2

the carriage, one being the operative position, the other the normal position. The first is determined by the bearing of a claw 8, with which the said plates A of the apparatus are provided, against two stops 9 secured to each cheek of the carriage, the second by the bearing of a stop 10, secured to the rod 7, against the support 6, when the apparatus is turned rearwardly. It will be seen that the apparatus can be removed easily from the carriage when the typewriter is to be used for usual operation.

The apparatus is essentially formed by two mechanisms located to the right and to the left respectively, relatively to the user, in two casings 11, 12 respectively (Fig. 2) and connected by transverse members and cross bars, as also by two driving rollers 13 and 14 for the cards. The mechanism on the right essentially constitutes the motor mechanism of the two rollers 13 and 14, whilst the left hand mechanism contained in the casing 12 permits of effecting the locking and unlocking of the rollers, the perforations of the cards and the fitting of these; the latter mechanism is not described in detail as it does not form part of the invention.

The roller 13 is provided for entraining the front card of which the driving mechanism also comprises a funnel 15 limited at the front by a transparent plate 16, at the rear by the front face of a partition 17, at the left by the plate 18 of the left hand mechanism and at the right by a cursor 19 of which the lateral position is adjustable according to the size of the card by means of a screw 20 enabling said cursor to be fixed to the rod 21. Some parts 22 of the roller 13 are covered with a material having a high co-efficient of friction with paper, such as, for example, emery powder. With each of the parts 22 co-operates a counter roller 23 pivoted to the end of a spring blade 24 secured in a groove 25 of the partition 17, so that the resilient force of the blade maintains the counter roller 23 applied against the respective part 22.

The roller 14 is provided for driving the rear card of which the driving device also comprises a funnel 26 limited at the front by the rear face of the partition 17, at the rear by the plate 27, at the left by the said plate 18 of the left hand mechanism and at the right by the cursor 28, of which the lateral position is adjustable according to the size of the card by means of a screw 29 enabling it to be secured to the plate 27. The roller 14 also comprises parts 22 covered with a material having a high co-efficient of friction with the paper, but these are displaced relatively to the parts 22 of the roller 13. Counter rollers 30, identical with the counter rollers 23, are provided for co-operating with the parts 22 of the roller 14.

A transverse member 31 is provided for ensuring that the front card, after having passed between the roller 13 and the counter roller 23, passes behind the main ribbon 32 of the typewriter and engages in the passage 33 formed by the two paper guiding plates 3 and 5. Two supplementary ribbons 34 and 35 are secured to the transverse members 36, 37 respectively.

A vertical scale 38 (Fig. 2) provided with graduations 39 in millimetres and comprising a cursor 40, is secured to the rear of the plate 27. The said cursor comprises a mark 41 and some numbered divisions 42, of which the spacing corresponds with the interlining determined by the apparatus on the cards.

The motor mechanism located in the casing 11 is supported by three parallel plates A, B and C (Fig. 3) connected together rigidly by cross pieces, not shown. The plate A has a lug 43 by which it is secured to the rod 7 (see Fig. 1). The mechanism comprises a shaft 44 which passes through the plates A and C, and is capable of turning freely therein. Said shaft 44 is extended in such a manner as to pass through the plate 18 (see Fig. 2) of the mechanism at the left and carries at its left

hand end a crank M enabling its angular movement to be controlled. A spiral spring 45 is secured at one end to the shaft 44 by means of a rivet 46 and, at the other end, to the drum 47 of a spring barrel 48 mounted loosely on the shaft 44. A pinion 49, secured to the spring barrel 48, is in engagement with a toothed wheel 50 secured to another pinion 51 mounted loosely on a shaft 52 secured to the plate A. The pinion 51 is in engagement with a toothed wheel 53 concentric to the shaft 44 and secured angularly thereto by means of a hub 54. The latter, secured to the shaft 44 by means of a pin 55, forms part of a friction device and has two grooves 56 with which engage pins 53a of the said wheel 53. With the said grooves 56 also engage pins 57a of the driving discs 57 of the friction device. The driven discs 58 of said friction device, capable of turning freely about the hub 54, are made solid in rotation by one or more small columns 59 secured to one of them, in the particular case to the last on the right (the lower disc 58 in Fig. 3), and adapted to engage with forks 60 provided in the others of the said discs 58. Between the discs 57 and 58 are located discs 61 of a material having a high coefficient of friction, such as felt, for example. The assembly of discs 57, 58 and 61 bears against a shoulder 62 of the hub 54 under the pressure of the resilient force of a spring 63 located between the wheel 53, which bears against the first discs 57 from the left, and a nut 64 screwed on a screw thread 65 of the shaft 44 and held in position by a lock nut 66. The movement of the nut 64 enables the pressure applied by the spring 63 on the assembly of discs to be varied and consequently the friction couple to be varied.

The last disc 58 from the right (the lowermost disc with reference to Fig. 3) to which the small columns 59 are secured, also carries a nipple 67 on which is pivotally mounted a pawl 68 adapted to co-operate with a ratchet wheel 69 secured to a flange 70 of a second drum P. To each side of the pawl 68 is secured a friction blade 71, one of the ends of each blade being provided in such a manner as to bear with light friction on one of the front surfaces of the ratchet wheel 69. The friction between the two blades and the ratchet wheel thus enables the engagement and the disengagement of the pawl 68 with and from the ratchet wheel 69, to be controlled according to the direction of rotation of the latter. For limiting the movement of the pawl 68 during its disengagement with the ratchet wheel 69, a stop 72 (see Fig. 6) is provided on the disc 58.

The second flange 73 of the spring barrel P is connected to the flange 70 by means of rivets 74; the flange 70 is provided on its periphery with ratchet teeth 75 (see Fig. 6) adapted to co-operate with a pawl 76 of which the spindle 77 is secured to the plate B. Said pawl 76 is also provided with friction blades 71 of which the co-operation with the flange 70 controls the engagement and the disengagement of the pawl 76. Between the flanges 70 and 73 is located a spiral spring 78 secured at one end to one of the rivets 74 and, at the other end, in two notches 79 of a hub 80 capable of turning on the spindle 44. The flanges 70 and 73 are capable of turning about the hub 80.

A lever 81 (Fig. 3) is secured to the right-hand end of the spindle 44 by means of a hub 82 and a pin 83. Between the hub 82 and the plate C a graduated disc 84 is pivotally mounted on the spindle 44. A locking device 85 enables the disc 84 to be made angularly solid with the plate C so that the disc 84 can occupy different angular positions relatively to the latter. To the said disc 84 is secured a finger 86 adapted to form a rear stop for the lever 81 and consequently for the crank M.

To the hub 80 is secured, by means of a screw 87, a toothed wheel 88 gearing with the teeth 89 of a hollow shaft 90, in such a manner that the latter is always subjected to a couple of the same direction under the action

of the spring 78. The speed of the shaft 90 is adjusted by a centrifugal governor of which the worm 91 is driven by a toothed wheel 92 secured to a sleeve 93. The latter is mounted pivotally on the shaft 90, between the plate A and the shoulder 90a and comprises teeth 94. To the sleeve 93 is also secured a wheel 95 with front dog teeth.

Two discs 96 and 97, secured to a hub 98, surrounding the shaft 90, are connected rigidly by stays 99. The assembly comprising the discs and the hub is rendered angularly solid with the shaft 90 by means of a pin 100 which, passing through longitudinal grooves 98a provided in the hub 98, co-operates with the stays 99. A piston 101, provided with a push button 101a, is located in the hollow shaft 90 and enables the hub 98 to be moved longitudinally on the shaft 90 through the medium of a pin 102 and against the action of a spring 103. The pin 102 passes through the shaft 90 through two elongated openings 104 in which it can slide when it is pushed by the piston 101.

In the discs 96 and 97 are provided openings, in which are located driving fingers 105, held in position by a spring 106 and a washer 107. Each of the fingers 105 is provided at one of its ends with a dog tooth 105a adapted to co-operate with the teeth of the wheel 95 and a wheel 110 respectively. The fingers 105 are so arranged that some co-operate with the wheel 95 and the others with the wheel 110.

Co-axially to the shaft 90 is located a bearing 108, secured to the plate B, in which is located a toothed hub 109 to which is secured the wheel 110 with frontal dog teeth. The toothed hub 109 gears with a toothed wheel 111. The latter is secured to a small shaft 112 to which is secured a pinion 113.

The teeth 94 of the sleeve 93 and the pinion 113 mesh with toothed wheels 114 and 115 respectively, secured together by means of cross bars 116 and capable of turning freely on the hub 122 and a shaft 120 respectively. The hub 122 can turn about the shaft 120 which is pivoted in the plates A and B. The two wheels 114 and 115 constitute the driving part of a differential which also comprises two pairs of satellite wheels 117 and 118 gearing with one another. The wheels 117 gear with teeth 119 of the shaft 120, the wheels 118 being in engagement with teeth 121 of the hub 122. Two toothed wheels 123 and 124 are secured to the shaft 120 and to the hub 122 respectively. The wheel 123 gears with a pinion 125 secured to the roller 13 provided for entraining the front card, the wheel 124 being in engagement, through the medium of a wheel 127, with a pinion 128 secured to the roller 14 provided for entraining the rear card.

The governor shown in Figs. 4 and 5 is a centrifugal governor. It comprises a spindle 130 provided with the worm 91 gearing with the toothed wheel 92 of the motor mechanism hereinbefore described. The ends 131 and 132 of the spindle 130 are pivoted in the bearings 133 and 134 secured to two lugs 135 and 136 of the plate A. Weights 137, carried by springs 138 secured to the spindle 130, are located in the interior of a brake drum 139 secured to a fork 140; said latter is capable of turning about the same geometrical axis as the spindle 130, by means of pointed screws 141 and 142 pivoted on the bearings 133 and 134. The pivoting of the fork 140 is limited by two stationary stops 126 and 129 (Fig. 5), the first determining the normal position of the fork which is maintained therein by a spring 157, the second determining the locking position of a lever 148 to be described hereinafter. A bracket 143, secured to the fork 140 by a screw 144, comprises a pivot 145 on which is pivoted one end of a link 146 of which the other end slides in a slot 147 provided in the plate C. The said link 146 is provided for effecting, by its end 146a, the locking of the lever 148 under predetermined conditions of operation described hereinafter. The lever 148 is pivoted on a pivot 149 secured to an angle piece 150 fixed to the plate C by a

screw 151 (see Fig. 3), and comprises a pin 152 adapted to engage with a groove 101b of the piston 101. The lever 148 also comprises a tongue 153 (Fig. 4) which is provided for co-operating with the lever 81, and a pin 154 on which is hinged a link 155 guided in a slot of the casing 11 and carrying an actuating knob 156 for the lever 148.

As shown in Fig. 7, the typewriter 158, on the carriage 1 of which is mounted the accounting apparatus above described, is provided with an electric motor 159 provided for the electric control of the interlining and the return of the carriage. The motor 159, through the medium of a transmission 160 and a clutch 161, drives a drum 162 on which is wound and secured a cable 163. The driving of the said drum 162 by the motor 159 is effected in the direction of winding the cable 163 on the drum. The cable 163 passes over a pulley 164 rotatable on a spindle 165 secured to a lever 166 pivoting on a spindle 167 secured to the carriage 1. The lever 166 can pivot between two extreme positions (indicated in the drawing by full and broken lines respectively), of which the first is the position of rest in which it is held by a spring 168. The said cable then passes over pulleys 169 and 170 (Fig. 6) turning on the spindles 171 and 172 respectively, which are secured to the plate A, so as to be wound on the drum 47 of the spring barrel 48 to which it is secured by its end 163a (Fig. 6).

The apparatus above described operates in the following manner:

When the carriage 1 is in the position shown in Fig. 7, into which it arrives at the end of typing a line, the interlining and return of the carriage are effected by electric control. This is effected by means of a key of the keyboard (not shown) of which the depression produces the coupling of the drum 162 to the motor 159 by means of the clutch 161. The motor 159 then drives the drum 162 in rotation in such a manner as to wind the cable 163 thereon. The pull on the cable causes the lever 166 to pivot against the action of the spring 168. The pivoting of the lever effects the interlining by a known mechanism, not shown. The lever reaching its extreme position (indicated in dotted lines in the drawing) is locked, in such a manner that the pull on the cable produces, through the medium of the pulleys 169 and 170, the rotation of the drum casing 48 about its spindle 44 and consequently the unwinding of the cable from the drum 47 and its winding on the drum 162. The rotation of the drum casing 48 continues until the part 163b of the cable between the pulley 170 and the drum 47, is located along an extension of a radius passing through the centre of the latter (Fig. 6). From this moment the traction on the cable no longer applies a couple to the drum casing 48 so that this stops, which enables the return of the carriage to be effected. The latter moves until a stop, connected to one of its margin stops, actuates a mechanism (not shown) controlling the release of the drum 162 from the motor 159 and consequently the stopping of the carriage 1.

During the rotation of the barrel casing 48, the gear train formed by the pinion 49, the wheel 50, the pinion 51 and the wheel 53, have produced an angular movement of the hub 54 and, consequently, an angular movement of the spindle 44. The gear ratio is so provided that the stopping of the spindle 44 takes place before the lever 81 can cause the lever 148 to pivot (position shown in full lines in Fig. 4). On the other hand, the relative movement between the drum casing 48 and the spindle 44 has enabled the spring 45 to be tensioned. The angular movement of the hub 54 enables, through the medium of the friction device described, the pawl 63 and the ratchet wheel 69 to tension the spring 78 of the drum motor P, of which the couple is transmitted by means of the toothed wheel 88 to the shaft 90. The latter transmits it in turn, by means of the pin 100, the stays 99 and the discs 96 and 97, to the driving fingers 105 in engagement with

the wheel 110. The couple is then transmitted, by means of the hub 109, the wheel 111, the shaft 112 and the pinion 113, to the wheel 115 and consequently to the wheel 114, then to the driving part of the differential. The two wheels 123 and 124, constituting the output of the differential, transmit the couple respectively to the roller 13 by means of the pinion 125 and to the roller 14 through the medium of the wheel 127 and the pinion 128. The direction of the couple thus transmitted to the rollers 13 and 14 corresponds to the direction of rotation of these latter during the expulsion of the cards. However, no rotation of the rollers is produced as these are locked by means, not shown, provided in the mechanism contained in the casing 12.

The drum 162 being thus de-clutched from the motor 159, the spring 45 expands producing rotation of the drum casing 48 in the opposite direction, so as to unwind the cable 163 from the drum and to again wind it on the drum 47 of the drum casing 48. The rotation of the latter produces the return of the spindle 44 into its normal position determined by the abutment of the lever 81 against the finger 86, whereby the rotation of the drum casing is stopped. The lever 166 is also returned to its normal position by the spring 168.

A spiral spring (not shown) secured at one end to the drum 162, and at the other end, to the framework of the typewriter, is provided for winding the cable 163 on the said drum when the movement of the carriage is effected without the assistance of the said cable (typing, tabulation, return of the carriage manually), in such a manner that the latter is always slightly tensioned. It will be understood that the pull applied by said spring on the cable should be weaker than the pull applied by each of the springs 45 and 168.

The return of the carriage having been completed, the paper and the necessary copies are placed in position. During this operation, the apparatus is in its normal position, that is to say raised rearwardly, from which it must be lowered into its operative position shown in Fig. 1. The position of the cursors 19 and 28 is then adjusted according to the width of the account card it is desired to use; these are placed into the typewriter and pressure is applied to the key 156, which causes the lever 148 to pivot on the pivot 149 up to its position indicated in chain dotted lines in Fig. 4. The pivoting of the lever 148 produces, through the medium of the pin 152, axial movement of the piston 101 against the action of the spring 103 (see Fig. 3).

The piston 101, by means of the pin 102, moves the hub 98 and consequently the assembly comprising the discs 96 and 97 and entraining fingers 105, in such a manner that the teeth 105a of the fingers 105 in engagement with the teeth of the disc 110, are disengaged therefrom whilst the teeth 105a, associated with the other fingers 105 and facing the teeth of the disc 95 engage with the latter. This operation is possible irrespective of the relative angular position of the teeth of the discs 95 and 110 on the one hand, and the fingers 105 on the other hand, said latter being capable of being moved axially against the action of spring 106. The couple of the drum P is thus transmitted by the shaft 90, the driving fingers 105 and the disc 95, to the sleeve 93, of which the teeth 94 transmit it to the wheel 114 of the differential. The latter is therefore from this moment subjected to a couple of opposite direction from that to which it was subjected previously and transmits it to the rollers 13 and 14 as already described above. Thus the rollers 13 and 14 are from this moment subjected to a couple tending to cause them to turn in the direction allowing the introduction of the cards. In fact, as the locking means provided in the mechanism located in the casing 12 are not active for this direction of rotation of the rollers, these are driven and entrain with the respective account cards.

As will be seen, the assembly comprising the hub 98, the discs 96 and 97 and the entraining fingers 105 in co-

operation with the wheels 95 and 110, constitutes a reversing device enabling a single drum P to drive the rollers 13 and 14 in two directions of rotation according to the position of the lever 148.

During the rotation of the mechanism, the wheel 92, in engagement with the worm 91 of the governor, drives the latter. Under the action of centrifugal force, the weights 137 spread and come into frictional contact with the brake drum 139 setting this in rotation with the fork 140 and the link 146 against the action of the spring 157, until the fork abuts against the stop 129. The drum 139 being stopped, the governor operates in the usual manner and regulates the speed of introduction of the cards. When the movable assembly formed by the fork 140 and the link 146 is in a position determined by the stop 129 (position indicated in chain-dotted lines on the drawings), the lever 148 is locked in the position into which it has been moved by the actuation of the knob 156. This locking is possible by reason of the fact that the shaft 130, the nipple 145 and the end 146a of the link are substantially along a straight line. The lever 148 being locked, it will be seen that the knob 156 may be released immediately without waiting for the cards to be introduced and the mechanism stopped.

When the cards have each arrived at the position corresponding with the desired line of typing, the rollers 13 and 14 are locked by means provided in the mechanism contained in the casing 12 and co-operating with the perforations of the cards. When the cards are blank and are not yet provided with perforations, the stopping is effected at a fixed distance from their upper edge determined by the apparatus. Each roller is locked independently of the other, the drive of one, after locking the other, being ensured by the differential mechanism described. The locking of the rollers stops the mechanism and consequently the governor, which enables the spring 157 to return the movable fork-rod assembly 140-146 to the normal position by unlocking the lever 148. As the latter is no longer locked, it is also returned to the normal position by the action of the spring 103 on the piston 101 and consequently on the nipple 152. The movement of the piston 101 produces the return of the reversing device to its initial position shown in the drawing. As a result the rollers 13 and 14 are, whilst remaining locked, subjected to a couple tending to cause them to turn in the direction corresponding to the expulsion of the cards.

When a failure in electricity, or of the motor, occurs, or when the typewriter is mounted on a carriage of which the return is effected manually, the typewriter can be actuated manually and operates in the following manner:

After having returned the carriage manually, the top sheet and necessary copy sheets are placed in position and the cards set in the typewriter, and the crank M is actuated from its normal position determined by the abutment of the lever 81 against the finger 36 under the action of the spring 45. The angular movement of the crank M, and consequently that of the spindle 44 to which it is secured permits, through the medium of the said friction device, of tensioning the spring 78 of the motor drum P, of which the couple is transmitted to the driving rollers 13 and 14 as hereinbefore described. The rotation of the handle M continues until the lever 81, by abutting against the tongue 153 of the lever 148 (Fig. 4), produces the rocking of the latter against the nipple 149, after which everything takes place as has already been described for the electrical operation. As the lever 148 is locked, the crank M may be released immediately without waiting for the cards to be inserted and the mechanism stopped. It is returned to the normal position by the spring 45 of the drum 48 which was tensioned during the angular movement of the spindle 44 by reason of the rotary movement between the said spindle and the drum 48, the latter being driven in rotation by

means of the hub 54, the wheel 53, the pinion 51, the wheel 50 and the pinion 49.

As will be seen, the typewriter may be actuated at will electrically or manually.

The cards are therefore introduced and ready to receive typing. This is impressed on the front card by the main ribbon 32 of the typewriter, on the rear card by the first supplementary ribbon 34 of the typewriter, on the first sheet by the second ribbon 35 of the typewriter and on the other copies of the original by sheets of carbon paper in the usual manner.

The rear card being hidden by the partition 17 and eventually by the front card, scale 38 serves to indicate the point up to which it is possible to type. By placing the cursor 40 in such a manner that its mark 41 is opposite the number of the scale corresponding with the distance in millimetres between the upper edge of the rear card and the last line which it is desired to type, the upper edge of the card indicates on the divisions 42 of the cursor the number of lines which can still be typed before the last.

After having completed the typing, the cards are ejected. This may be effected in the following ways:

(a) By the interlining control (manual or electrical) of the typewriter, with the perforation of the cards and advance by one line of typing. In this case, a knob 173 (Fig. 2) having four positions enables one of the following possibilities to be selected.

(1) Front card and rear card expelled completely.
(2) Front card advances by one line in the outward direction, and the rear card expelled completely.
(3) Front card expelled completely and rear card advanced one line.

(4) Front card and rear card advanced by one line.
(b) By four push buttons 174, 175, 176 and 177, without perforation of the cards and without advance of the line of typing. These four push buttons, of which the first two control the front card and the last two the rear card, permit either of complete expulsion, or the advance line by line of the cards.

The mechanisms controlled by the members 173 to 177 have not been described in detail herein, as they do not form part of the invention.

It will be understood that the ejection of the cards is also controlled by the speed governor. This rotating in a direction opposite to the direction of introduction, does not produce any pivoting of the movable fork-rod assembly 140-146 and consequently no locking of the lever 148.

The cards expelled are removed from the typewriter and new cards may be introduced in place thereof.

When it is necessary to introduce a card for making corrections or additions on a line already typed, the procedure is as follows:

The card is engaged normally in the typewriter and introduced in the manner described, with the difference that the control member, the crank M or the knob 156, is not released but held in the operative position, whilst the other hand controls, through the medium of the push button 175 or 177 respectively, the line by line advance of the card. This control is effected as many times as lines have already been typed between the last line and the line, inclusive, in which it is desired to make corrections or additions. When this position is reached, it is necessary to release the control (crank M or knob 156) and proceed with the typing.

It will be understood that the angular stroke of the spindle 44 must in every case be sufficient to reset the spring 78 of the drum P at least as often as it expands in use, so that the spring 78 completely tensioned, forms a reserve of energy sufficient to ensure a number of operations (introduction or expulsion of cards) greater than the number of operations of the control member (knob 156 or crank M). As the energy supplied to the drum P by the spindle 44 depends on the angular stroke of the

latter, the energy supplied by the drum P depends on the number of cards introduced and expelled (one or two) and on the height to which each is introduced, in other words dependent on the total number of turns which the rollers 13 and 14 must accomplish for the introduction and expulsion of the cards. For the purpose of obtaining the above mentioned energetic equilibrium, on the one hand, and to avoid useless prolonged operations involving a loss of time and supplementary fatigue of the user, when the crank is used, on the other hand, provision is made for an adjustment of the angular position of the disc 84 carrying the finger 86 serving as rear stop for the lever 81 and consequently determining the rear position of the spindle 44. The position of the said disc 84 is thus adjusted by means of an appropriate graduation, with which it is provided, in such a manner that the angular stroke of the spindle 44 is always such that the energy supplied to the drum P is in every case superior to that produced by the latter. The spring 78 of the drum P is for this reason always fully tensioned and the friction device 57-58 prevents provocation of its eventual breakage.

As will be seen from the foregoing description, the typewriter described has, relatively to known typewriters, the following advantages:

(1) The simultaneous introduction of two account cards by a single operation of a single control member.

(2) The introduction of the cards is not effected directly by the control member, but by means of a single drum P of which the speed of rotation is regulated; any risk of tearing the perforation of the cards and of their slipping relatively to the driving mechanism, in the case of brutal actuation of the control member, is eliminated.

(3) A single motor mechanism for the two cards.

(4) A more sustained rhythmical operation by reason of the locking device controlled by the speed governor, enabling the control member to be released immediately and, whilst the cards are introduced automatically, to prepare for typing.

(5) The same electric motor provided for effecting the return of the carriage is used for controlling the typewriter.

It will be understood that various modifications may be applied to the typewriter described. Thus, for example, the crank M may be secured to the right-hand end of the spindle 44 in order to enable it to be actuated with the right hand. The emery powder used for the parts 22 of the rollers may be replaced by another material having a high co-efficient of friction with the paper, such as, for example, rubber.

From the foregoing it will be seen that the typewriter described by way of example is provided for the simultaneous introduction of two independent account cards. It will be understood that a similar typewriter, comprising the principal features of the typewriter above described, may be provided for the automatic introduction of a single card. In this case the typewriter is provided with only one driving roller (13 or 14), so that the use of a differential will not be necessary. It would be sufficient, for example, to provide three toothed wheels keyed to the shaft 120, of which two would cooperate with the device for reversing the direction of rotation, whilst the third is adapted to drive the said roller. It will be seen readily that a typewriter of this character would operate in the same manner as that described by way of example.

Further, it will be understood that an apparatus provided for the introduction of two cards may be used, without modification, for the introduction of a single card, if this is necessary.

We claim:

1. An accounting apparatus adapted to be mounted on the carriage of an office machine, particularly a typewriter, comprising a driving device including rollers for moving at least one account card and introducing the latter automatically into said apparatus, a single

spring barrel, a reversing device connecting said spring barrel to said rollers, so as to enable them to be driven in both directions, a governor for controlling the expansion of the spring of said spring barrel, and a friction device through which the rewinding of said spring may be effected.

2. An apparatus according to claim 1, for the automatic introduction of two independent account cards into said apparatus, comprising a differential interposed between said rollers and said reversing device, and a single control member, a single operation of which permits of the simultaneous introduction of said cards through rotation of said rollers.

3. An apparatus according to claim 2, wherein said differential comprises spur gears with external teeth.

4. An apparatus according to claim 1, wherein said reversing device comprises driving fingers, two wheels having dog teeth and a support in which said fingers are axially slidable against the action of springs, said fingers being adapted to co-operate respectively with said dog teeth of said two wheels.

5. An apparatus according to claim 1, together with a brake drum and two fixed stops and wherein the said governor is a centrifugal governor having masses which co-operate with said brake drum, a spring connected to the drum providing an elastic force thereon, said brake drum being capable of moving angularly under the action of a couple due to the friction between said drum and said masses when said governor is driven, said movement taking place between two extreme positions determined by said two fixed stops and against the action of said elastic force adapted to maintain said brake drum in a position of rest when the governor is stopped and wherein a control means is connected to said brake drum in such a manner as to permit of effecting various controls by the different positions of the brake drum between said two fixed stops.

6. An apparatus according to claim 5, comprising a mechanism for controlling said reversing device and wherein said control means produces the locking of said control mechanism in one of the extreme angular positions of said brake drum and the unlocking of said mechanism in the other extreme position of said brake drum.

7. An apparatus according to claim 1, wherein the said rollers are, at least in part, covered with emery powder, so as to increase the coefficient of friction between the said account card and the said rollers.

8. An apparatus according to claim 1, comprising means enabling only a single motor to ensure successively interlinear control, rewinding of the spring of said spring barrel, and the return of the carriage.

9. An apparatus according to claim 8, comprising a control lever for the interlining, a pulley rotatably mounted on said lever, a first drum connected to said friction device, a second drum operatively connected to said single motor, a cable wound on said first drum, said cable passing around said pulley and being attached to said second drum in such a manner that a rotation of said second drum first produces a movement of said interlining control lever due to the traction of said cable, then the rotation of said first drum permitting, through the medium of said friction device, the rewinding of the spring of said spring barrel and finally, when said first drum is entirely wound off, the return of the carriage through greater traction of the cable on said interlining control lever.

References Cited in the file of this patent

UNITED STATES PATENTS

2,675,904 Maurer Apr. 20, 1954

FOREIGN PATENTS

887,821 Germany Aug. 27, 1953