Sept. 20, 1949. L. F. HAGEMAN 2,482,108

PAPER FEED FOR WRITING MACHINES

Filed Nov. 4, 1946

3 Sheets-Sheet 1

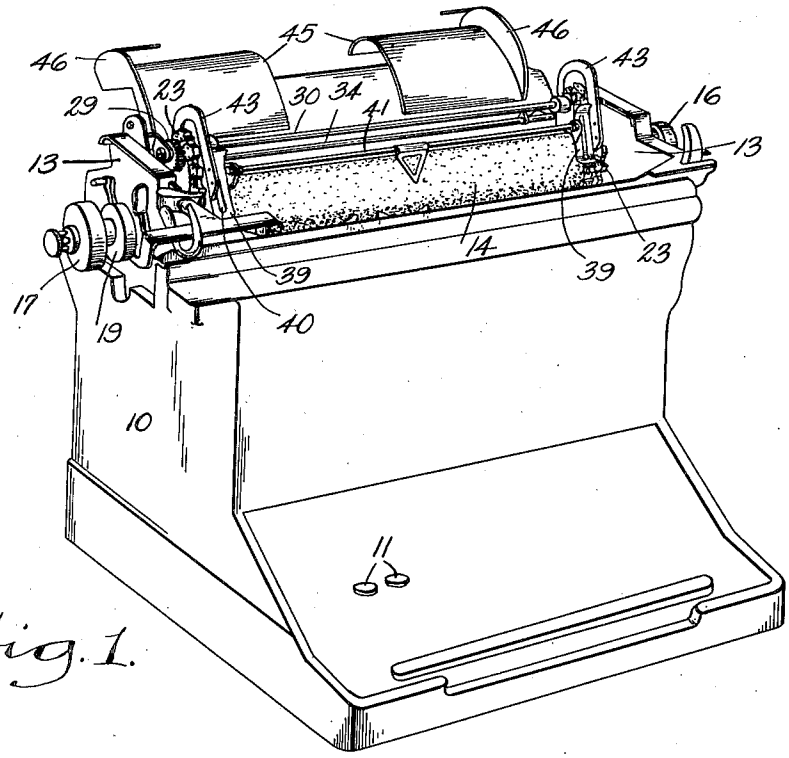


Fig. 1.

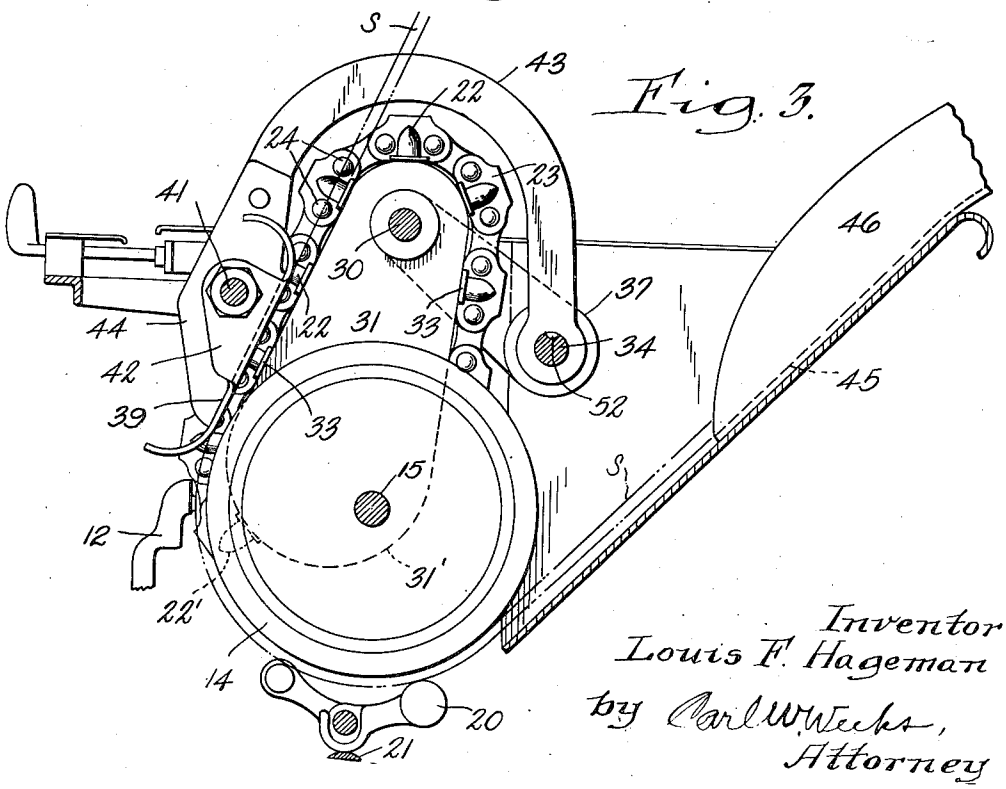


Fig. 3.

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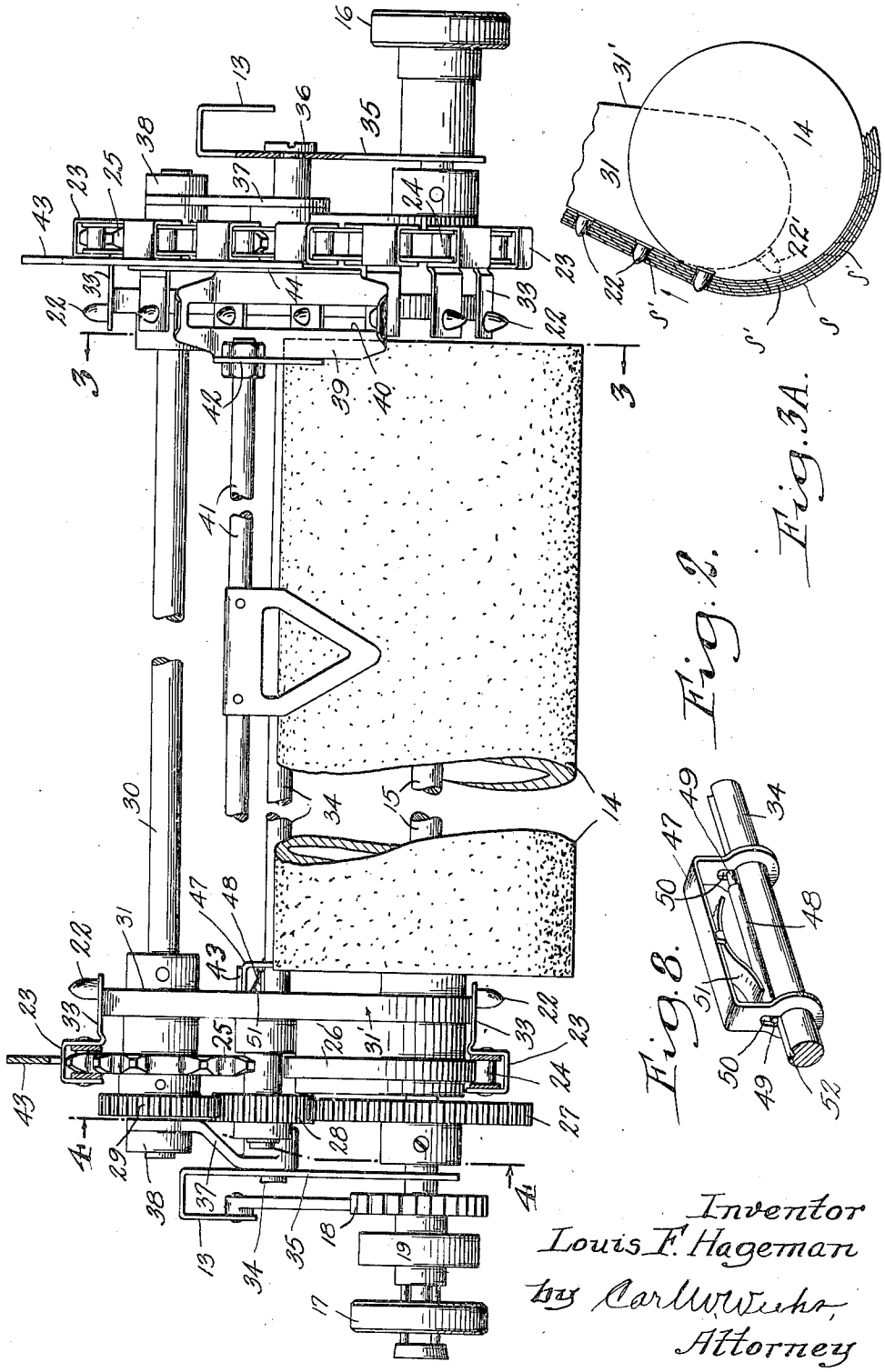


Fig. 2.

Fig. 3A.

Fig. 8.

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3 Sheets-Sheet 3

Fig. 4.

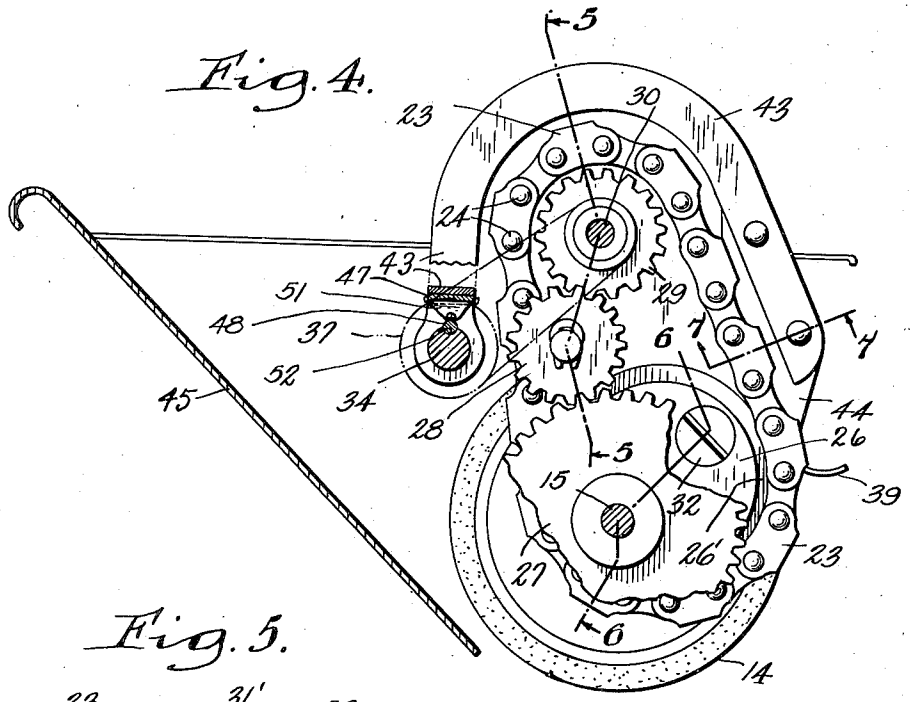


Fig. 5.

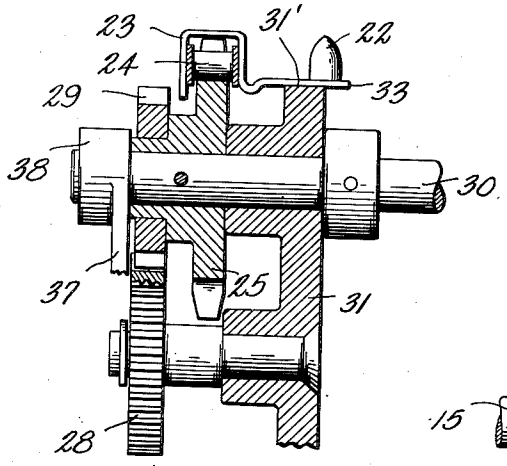


Fig. 6.

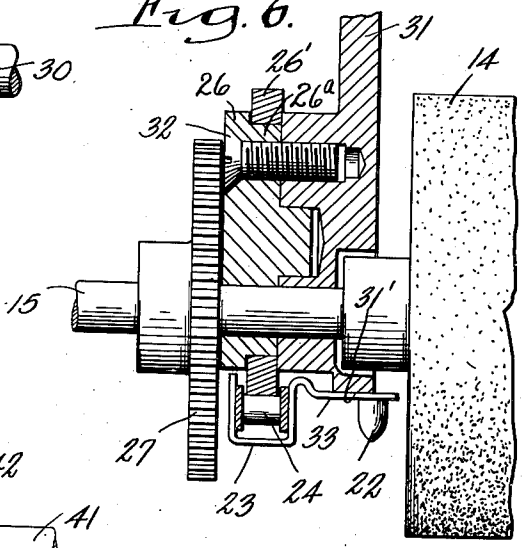
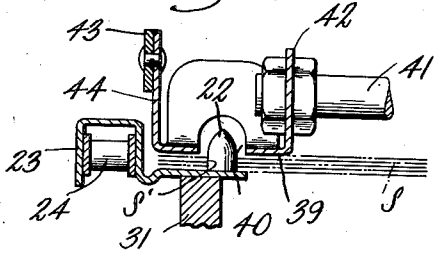


Fig. 7.



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UNITED STATES PATENT OFFICE

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PAPER FEED FOR WRITING MACHINES

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Application November 4, 1946, Serial No. 707,625

21 Claims. (Cl. 197—133)

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This invention relates to improvements in writing machines of the type employing cylindrical writing surfaces or rotary cylindrical platens, and more particularly to improvements in feeding mechanism for feeding paper strips or record forms in such machines, especially those record forms of the long continuous traveler type having series of printed blank forms arranged therealong and pulled or fed forwardly from a supply by the improved feeding mechanism into writing position on the platen. Such record forms are extensively used and well-known and may be either a single long continuous record strip or a plurality of such strips in superposed relation, with interleaved transfer strips arranged in transfer relation to transfer the writing to the underlying record strips. The improved feeding mechanism may also be used to advantage with single form length record forms.

It is a general object of the invention to provide for machines of the type mentioned, an improved strip or record form feeding and aligning mechanism constructed and arranged for feeding the record forms to and over the platen and for maintaining the superposed record forms in correct alignment with each other at the writing line of the platen, and to maintain the blank forms in correct alignment with reference to the writing line of the platen during the writing operation, assuring the entry of the inscriptions in the proper spaces or lines provided therefor.

A further object of the invention is to provide for machines of the class mentioned, an improved strip or form feeding mechanism for maintaining the strips in correct alignment with each other and with the writing line of the platen, and which is capable of being applied to typewriting machines of existing standard construction with little alteration of the machines, and is also capable of being easily removed for repairs or adjustments.

Still another object of the invention is to provide for machines of the class mentioned, an improved strip or form feeding mechanism of the type having feed pins carried by a flexible belt or chain and engageable in series of feed apertures in the strips, and arranged in an improved manner to engage the feed apertures in the vicinity of or substantially in longitudinal alignment with the writing line of the cylindrical platen, thus maintaining the strips in correct registry with each other where superposed strips are used, and maintaining the record receiving spaces or forms of the strips in correct alignment with reference to the writing line of the platen and assuring the entry of the inscriptions properly in the spaces provided therefor.

Another object of the invention is to provide for machines of the class mentioned, a pin feed mechanism for the record strips or forms having

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an improved arrangement of feed pins with reference to the platen so as to maintain the writing spaces or lines of the strips or forms in correct registry with the writing line of the cylindrical platen surface, and to maintain the writing lines or spaces of the different superposed strips in correct registry with each other in cases where a plurality of such strips are employed.

According to an important feature of improvement of the invention a feed pin carrying belt or chain extends around the center of rotation of the cylindrical writing platen of the writing machines or around the center of curvature of the platen surface, and passes over a curved supporting surface adjacent to the platen which is eccentric to the platen writing surface, whereby the pins are positioned to enter into engagement with the feed apertures of the record forms or strips near to the writing line of the platen, and to be positioned in feeding and aligning relation with said feed apertures near to or substantially in line with the writing line of the platen, thus maintaining the writing spaces or lines of the blank forms of the record strips or forms in correct registry with reference to the writing line of the platen, and in correct registry with each other in the different superposed strips at said writing line and assuring entry of the inscriptions in correct alignment in the spaces provided therefor.

Still another object of the invention is to provide for machines of the class mentioned, an improved pin feed mechanism in which the feed pins are positioned and arranged to engage the strip feed apertures in feeding relation therewith substantially in line with the writing line of the cylindrical platen, and to maintain a longitudinal series of the pins in constant engagement with the strip feed apertures, thus maintaining the writing spaces or lines of the record forms or strips in accurate registry with the writing line of the platen and in accurate registry with each other in the different superposed strips at said writing line and assuring the correct entry of the inscriptions in the writing spaces.

Another object of the invention is to provide for machines of the class mentioned, an improved strip feeding and aligning mechanism having feed pins arranged to enter strip feed apertures after an assembly of such strips in superposed relation has passed over a considerable portion of the cylindrical platen circumference and the feed apertures have thus been slightly longitudinally disaligned, thus restoring correct alignment of the superposed strips and apertures at the writing line, and providing for correctly feeding and aligning a large number of such superposed strips.

Another object of the invention is to provide for machines of the class mentioned having

cylindrical platens, an improved tractor pin feed positioned and arranged to engage in feed apertures in the strips in feeding and aligning relation therewith near to or substantially at the writing line of the platen, whereby the record forms thus fed can receive written inscriptions near to the tops of the forms.

It is also an object of the invention to provide an improved record strip guide for keeping the record strips in correct position for engagement in feeding relation with the feed pins, and being specially constructed and arranged for installation on machines of the characters described of existing construction upon which the improved feeding mechanism is installed.

Other objects of the invention will be in part pointed out in the following detailed disclosure of an illustrative but preferred embodiment of the invention, and will be in part obvious as the disclosure proceeds.

The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts, which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claims.

For a more comprehensive disclosure of the nature, objects and advantages of the invention, reference is had to the following detailed description, and to the accompanying drawings, in which:

Fig. 1 is a partially diagrammatic front perspective view of a well-known commercial typewriting machine with the present invention applied thereto;

Fig. 2 is a fragmentary enlarged front elevation of the writing machine shown in Fig. 1, showing the writing platen and associated parts including the improved strip feeding mechanism, parts being shown in section and parts removed to disclose the construction and arrangement more clearly;

Fig. 3 is a longitudinal vertical section taken substantially on the line 3—3 of Fig. 2 looking in the direction of the arrows, parts of the improved feeding mechanism and other parts being shown in elevation;

Fig. 3A is a partially diagrammatical fragmentary enlarged detail sectional view similar to that of Fig. 3, illustrating the manner of entry and engagement of the feed pins in the record strip feed apertures, and the disposition of the strips on the cylindrical platen;

Fig. 4 is a detail longitudinal vertical sectional view taken substantially on the line 4—4 of Fig. 2 looking in the direction of the arrows, parts being broken away and parts being shown in elevation to disclose the improved feeding mechanism more clearly;

Fig. 5 is a detail enlarged sectional view taken substantially on the irregular line 5—5 of Fig. 4 looking in the direction of the arrows;

Fig. 6 is an enlarged detail sectional view taken substantially on the irregular line 6—6 of Fig. 4 looking in the direction of the arrows;

Fig. 7 is an enlarged detail sectional view taken substantially on the line 7—7 of Fig. 4 looking in the direction of the arrows; and

Fig. 8 is a detail view of the mounting for the strip guide.

Referring to the drawing for a detailed description of the illustrative embodiment of the invention, the improved feeding mechanism is shown as being installed upon a well-known commercial typewriting machine, although it will be understood that the invention is equally well

adapted for installation on other commercial forms of typewriting machines, tabulating machines and other known forms of writing machines. For illustrative purposes the improved strip or form feeding mechanism is shown as being applied to an Underwood typewriting machine having a main frame or body 10 with a keyboard having type keys 11 which are connected for operation of the type bars 12, one of which is shown in Fig. 3. Superposed upon the frame 10 is a platen carriage 13 carrying the cylindrical writing platen 14 rotatably mounted in suitable bearings in the carriage by means of a platen shaft 15. As is well-known in the art the platen carriage 13 is mounted upon the frame 10 for longitudinal translatory movements of the platen transversely of the typewriter frame for letter spacing and for return movements.

Also as well-known in the art, the cylindrical platen 14 is adapted to support the record strip or assembly S of long continuous record strips in writing position for receiving the printed impressions imparted by the type bars 12, and the platen is adapted to be rotated manually by means of knobs or handles 16 and 17 to feed the strips past the writing line of the platen which is the line extending longitudinally along the platen surface at which the type bars strike to impress the printed characters. Ordinarily the platen shaft is provided with a ratchet wheel 18 having ratchet teeth engaged by a pawl in well-known manner for stopping or checking the platen in definite line spacing positions in a manner familiar to those skilled in the art. Positioned adjacent to the platen knob 17 is a platen release device 19 with manual control therefor operative for permitting the platen shaft to be adjusted with reference to platen movement so as to bring the record forms or writing lines of the record strips in position to receive the printed impressions of the type bars in correct registry when the platen is caused to come to rest by operation of the ratchet wheel 18, all in a manner well-known in the art. Also the standard typewriting machine is ordinarily equipped with one or more pressure rolls 20 mounted to press the record strips against the cylindrical platen surface and controlled by means of a manually operated operating device 21. By means of this operating device the pressure rolls 20 may be adjusted so as to press the record strips into frictional engagement against the platen surface whereby they can be frictionally fed by rotating the platen; the pressure rolls 20 can also be released or moved out of engagement with the cylindrical platen surface to inoperative position in well-known manner.

In accordance with the present invention the record strips S can be fed forwardly accurately independently of the friction feed rolls 20, so as to bring the record forms or writing spaces of the strips into accurate alignment with the writing line of the platen, whereby the printed impressions are received in proper spaces upon the forms. Also the record forms of the different superposed record strips of the assembly are thus accurately aligned with each other at the writing line, whereby the transfer impressions made by transfer or carbon strips interposed between the record strips, are received in correctly aligned positions in the writing spaces provided therefor. The improved feeding mechanism for accomplishing these desired results will now be described in detail.

According to the preferred embodiment of the

improved strip feeding mechanism, feed pins 22 are mounted in series arrangement for engagement in feed apertures S' in the record strips S and are supported for longitudinal movement to feed the strips by means of an endless flexible carrier belt herein shown in the form of a sprocket chain 23 made up of a longitudinal series of links pivotally connected together by pivotal attachments 24. The sprocket chain passes around a rotatable driving sprocket 25 having a peripheral series of driving teeth engaging the chain links to drive said chain. The sprocket chain and the series of feed pins carried thereby are positioned to be moved into engagement with the record strip or strip assembly at a reach or arc of the latter which is in engagement with the cylindrical platen surface at a point near to the writing line thereof, in a manner more fully described below. The sprocket wheel 25 is preferably positioned a short distance above the cylindrical platen 14, and its axis of rotation is offset rearwardly somewhat from the vertical line passing through the axis of rotation 15 of the platen, whereby the reach of the sprocket chain carrying the feed pins 22 which are in engagement in feeding relation in the strip apertures of the strip assembly S, inclines to the rear from the front of the platen as clearly shown in Fig. 3. This rearward inclination of the series of feed pins may vary somewhat in practice.

Positioned below the driving sprocket wheel 25 is a second supporting member 26 for the sprocket chain 23 around which the sprocket chain passes in supporting relation therewith. This supporting member 26 is herein shown in the form of a circular or cylindrical disc positioned adjacent to the end of the platen 14 and firmly but rotatably secured in position as later described. The supporting member 26 may have an annular chain-engaging member or wheel 26' rotatably supported upon a circular boss 26a on the inner side thereof. This rotary supporting wheel or ring 26' has a smooth peripheral supporting surface on which the sprocket chain is supported. As shown in Fig. 2 the sprocket chain links engage the smooth peripheral surface of the supporting ring 26' to support the chain in its operative movements. For some purposes the chain supporting ring 26' may be secured against rotation, in which case the chain would slide upon the smooth peripheral surface of the ring.

While two sprocket chains 23 with driving connections and mounting therefor are shown, both are substantially the same in construction and arrangement, and therefore a detailed description of only one of these chains is necessary. For some purposes and for some installations one of the strip feed chains can be omitted and the strip feed effected wholly by one such chain in engagement with the series of feed apertures at one longitudinal margin of the record strip assembly S.

Both driving sprockets 25 are driven when the platen 14 is rotated by means of a plurality of intermeshing toothed gears, the driving gear 27 being securely attached to the platen shaft 15 for rotation therewith. The driving gear 27 meshes with an idler gear 28 which in turn meshes with a driven gear 29 securely attached on a driving shaft 30 rotatably mounted in appropriate bearings. The driving sprockets 25 are also connected to the driving shaft 30 for rotation in unison with rotation of the driving shaft. The driving gears need be supplied at only one

end of the platen, and the gear ratio is such that the feed pins 22 travel at about the same speed as that of the cylindrical platen surface.

Chain supporting and positioning members 31 are positioned respectively adjacent to opposite ends of the platen 14 and to which the chain supporting members or discs 26 are respectively rigidly secured as by means of attaching screws 32. Both the chain supporting member 31 and the supporting disc 26 are bored to receive the platen shaft 15 which thus provides one support for these members. The upper end of each chain supporting member 31 is additionally supported by the transverse driving shaft 30 which passes through openings in the upper end portions thereof in which the shaft is closely received.

It will be seen that the chain supporting members 31 are in the form of cams having outer peripheral cam surfaces 31' upon which parts of the sprocket chain 23 are supported and guided. The lower part of the cam surface 31' is substantially circular and concentric to the adjacent supporting surface of the supporting disc 26' while the upper part of the cam surface 31' is substantially straight for some distance forming an elongated support for the chain links and feed pins supported thereby as later more fully described.

While the peripheral supporting surfaces of the chain supporting member 26' and the lower portion of the cam surface 31' are substantially concentric with each other, both are eccentrically positioned with reference to the cylindrical surface of the platen 14 and to the center of rotation thereof. The bore or opening in the supporting disc 26 through which the platen shaft 15 extends is eccentric to the peripheral surface of ring 26', and likewise the bore of the supporting member 31 through which the platen shaft extends is eccentric to the lower circular cam surface 31' thereof. Also it will be observed that the radius of the circular supporting surface 31' is shorter than that of the supporting surface of the supporting member 26', the purpose of which appears later.

Each pin supporting link of the sprocket chain 23 has a laterally extending pin supporting bracket 33 positioned somewhat below the line of centers or pitch line of the pivotal connections of the chain links as best seen in Figs. 2 and 5. The feed pins 22 extend upwardly or outwardly from the supporting brackets 33 toward the pitch line preferably terminating adjacent to or somewhat above the pitch line. The pin supporting brackets 33 engage with and are supported by the cam surface 31' of the supporting member 31, these brackets thus slidably engaging the lower circular portion of the cam surface 31' and also the upper elongated straight portion thereof. The pin supporting brackets and feed pins are supported by this cam surface throughout their length or travel in which they are engaged in feeding relation with the strip apertures. This mounting of the feed pins below the pitch line of the flexible carrier or sprocket chain is fully disclosed in the Mabon Patent No. 2,171,003 for "Strip feeding and aligning mechanism" issued August 29, 1939, to which reference is made for a full disclosure of this arrangement.

As mentioned above the two sprocket chains 23 with associated pin feed mechanism positioned adjacent to the opposite ends of the platen 14 are similar in general construction and arrangement. These two pin feed mechanisms are con-

nected by transverse members or tie rods which include the platen shaft 15 extending through the openings in the lower ends of the sprocket chain supporting cam members 31, and the sprocket driving shaft 30 extending through the openings in the upper ends of the cam members 31. An additional transverse tie rod 34 is connected at its opposite ends to the end frames 35 of the platen carriage, one end being seated in an opening in the adjacent end frame 35 and the other end anchored by means of an appropriate attaching device 36. The platen shaft 15 also extends through openings in the end frames 35 of the platen carriage, suitable bearings for rotatably supporting it being provided. The sprocket drive shaft 30 is not directly connected to the end frames or brackets 35 of the platen carriage but is held in its correct operative position by means of braces or supporting arms 37 connected at one end of each to the transverse tie rod 34 and at their opposite ends they are provided with bearings 38 rotatably receiving the adjacent ends of the driving shaft 30. Since the sprocket drive shaft 30 also extends through and is rotatably supported in the upper ends of the chain supporting cam members 31, a supporting frame for the feeding mechanism is provided that can be very quickly and easily installed in operative position, and on known forms of writing machines.

Strip guiding means for guiding the record strips in correct position with reference to the series of feed pins is provided. In the preferred embodiment shown this improved strip guiding means includes a strip engaging guide plate 39 for each of the two series of feed pins 22. Each guide plate is provided with a longitudinal slot or runway 40 in which the feed pins travel. The two opposite guide plates 39 are connected by a transverse tie rod 41 connected to the inner flanges 42 of the guide plates. A supporting arm 43 is provided for each guide plate 39 being connected to the upwardly extending reinforcing flanges 44 thereof by rivets or similar attaching means while at their opposite extremities these supporting arms 43 are pivotally connected to the transverse tie rod 34. The guide plates 39 engage the outer surfaces of the assembly of record strips S while the feed pins 22 run in the longitudinal slots 40 thus positioning and maintaining the record strips in their correct feeding relation with the feed pins in engagement with the feed apertures S' of the strips. Positioning means are preferably provided for the guide plates 39 to maintain them in correct strip engaging and positioning relation without unduly gripping or binding the strips against the feeding mechanism.

A paper table or guide 45 is provided for guiding the record strips from a suitable supply such as a zigzag folded supply pack into writing position on the platen 14. This paper table may be constructed in two parts laterally adjustable toward and away from each other to accommodate strips of different widths and the outer marginal portions of the guide are preferably provided with upwardly extending guide flanges 46 positioned for engagement with the opposite longitudinal edges of the record strips to assist in keeping them in correct longitudinal alignment with reference to the feeding mechanism. This strip guiding arrangement is of particular assistance in maintaining the strips in correct longitudinal alignment with the platen and feeding mechanism in cases where a single feed chain with its series of feed pins is being used. When both of the feed chains are being utilized the strips are ordinarily maintained in correct alignment without additional aligning means.

From the above detailed description together with the illustration of the drawing the operation of the improved feeding mechanism will be understood by those skilled in the art. Also from the detailed disclosure (note particularly Fig. 3) will be seen that the path of travel of the feed pins 22 during movement of the pins into engagement with the feed apertures of the strips is eccentric to the cylindrical surface of the platen on which the strips are supported and also eccentric to the center of rotation of the platen. It will be noticed also that the path of the feed pins converges with that of the strips on the cylindrical platen surface whereby the pins are gradually moved into strip engaging feeding relation as feeding of the strips progresses. The pins approach the respective feed apertures from the inner sides of the strips at an arc or reach thereof engaged by the platen and the pins are substantially in feeding and aligning engagement with the strip apertures substantially at or in longitudinal alignment with the writing line of the platen. The result of this action is not only to maintain the strips in correct alignment with each other at the writing line of the platen but also to maintain the writing spaces or blank forms of the record strips in correct alignment with the writing line whereby the printed impressions are correctly entered at all times in exact alignment with the spaces provided therefor. As well-known in the art, the blank spaces or lines of the record forms may be correctly initially aligned with the writing line of the platen by means of the initial adjusting device or release device 19.

When a plurality of superposed record strips are passed in an assembly such as the assembly S around a cylindrical platen there is a tendency for the different superposed strips to become slightly longitudinally disaligned, thus similarly disaligning the blank forms or writing lines. With this improved feeding mechanism this longitudinal disalignment of the strips is effectively corrected at the writing line by entry of the pins into engagement with the feed apertures so as to be substantially fully engaged in feeding relation in the apertures when the strips reach the writing line. The mounting of the feed pins 22 below the pitch line or pitch surface of the sprocket chain, as above set forth and as fully described in Patent No. 2,171,003 above referred to, assists additionally in effecting and maintaining the strips in correct alignment at the writing line because the feed pins are moving substantially at the same longitudinal speed as the record strip assembly at the time that the pins are entering into engagement with the feed apertures thus avoiding binding of the pins against the edges of the apertures during entry thereof.

As soon as the pins advance beyond writing line of the platen they still remain in full engagement with the feed apertures so as to accurately feed the strips. As the pins pass beyond the curved or circular surface 31' of the chain supporting cam plate 31 they pass on to and are guided by the straight portion of this cam surface thus causing the pins to move in a path diverging with the cylindrical platen surface. Thus the feed pins at an elongated reach of the feed belt along this divergent path remain in full feeding engagement in tne strip apertures thus positively maintaining the strips in correctly aligned position and effectively feeding them. Ordinarily

three successive pins on each feed belt will remain in feeding engagement with the strips at all times. It will be understood that the number of successive pins thus remaining in feeding engagement may be varied by varying the length of the straight guiding surface 31'.

As above described, it will be particularly noted that the flexible carrier chain 23 and feed pins 22 carried thereby are supported during entry of the pins into feeding relation in the strip apertures both by the smooth peripheral surface of the supporting disc 26' and by the concentrically disposed circular supporting surface 31' of the supporting and positioning cam member 31. Since the radius of the supporting disc 26' is slightly greater than that of the curved portion of the supporting surface 31', the pin supporting brackets 33 positioned within the pitch line of the sprocket chain are concurrently supported during feeding movements while the main sprocket chain 23 is similarly supported as clearly shown in Fig. 6. It will be understood that in the embodiment shown the supporting members 31 are stationary and that the sprocket chain and pin supporting brackets slidably engage the smooth peripheral surfaces of these supporting elements while the feed travel of the sprocket chain is effected by driving the feed sprockets 25 as described. The supporting members 26' may be either rotatable or stationary as described, and hence the chain may in some cases slide on the peripheral surface of the rings or discs 26'. Since the feed sprockets 25 are positively driven, the sprocket chain and feed pins are pulled with a tractive effort thus effecting more positive and accurate feeding of the record strips.

It will be understood that the point of complete entry, with reference to the writing line of the platen, of the feed pins 22 into feeding relation in the strip apertures may vary slightly in actual practice but it is desirable that the pins be fully entered in the apertures in the vicinity of the writing line. After the pins are thus fully engaged in the strip apertures they remain in this position over a considerable space of traveling so as to exert feeding and aligning action upon the strips until the pins are withdrawn from engagement with the apertures as the feed chain passes over the curved surface of the sprocket wheel 25, as can be seen clearly in Fig. 3. In Fig. 3A the feed pin 22' shown in dotted outline is about to begin entry into the set of feed apertures S' adjacent thereto just before this set of feed apertures reaches the writing line of the platen, which, as shown in this figure, is positioned between the feed pin 22' and the next successive feed pin 22 thereabove. It will thus be seen that each successive feed pin enters into engagement with the feed apertures of the record strips at an arc or reach of the record strips positioned upon the cylindrical surface of the platen. As indicated somewhat diagrammatically in Fig. 3A, the feed apertures in the superposed strips are progressively disaligned with each other before reaching the writing line due to the bending of the strip assembly over the cylindrical platen surface. As the strip assembly enters or approaches the cylindrical platen surface the feed apertures in the individual superposed strips are ordinarily progressively disaligned. However, the important function is to cause the record strips and the writing lines or spaces thereof to be accurately aligned in superposed relation at the writing line and this function is effectively accomplished by this improved feeding mechanism.

As mentioned above, positioning means for the strip guides 39 is provided for maintaining these guides in the proper relation with reference to the strips being fed by the feeding mechanism. In the embodiment shown, this guide positioning means is mounted adjacent to the pivotal mounting of the supporting arms 43. Preferably one of these positioning means is provided for each supporting arm. As shown in Figs. 2, 3 and 8, an inverted U-shaped bracket 47 is connected to each guide supporting arm 43 and pivotally mounted upon the transverse tie rod 34. Between the arms of this U-bracket is a detent member 48 in the form of a roller rotatably connected at each of its opposite ends by means of pintles or extensions 49 engaging in short vertical slots 50 in the supporting arms of the U-shaped bracket. Interposed between this detent roller 48 and the U-bracket is a leaf spring 51 which in the embodiment shown is in the form of a semi-elliptical leaf spring bearing at its center against the U-bracket and bearing at each of its opposite ends against the detent roller. This spring is stressed to urge the detent roller into a longitudinal groove or seat 52 formed in the surface of the transverse tie rod 34. Seat 52 preferably conforms approximately to the surface of the detent roller 48.

When the strip guide plates 39 are in their correct operative engagement with the record strips being fed by the feeding mechanism, the detent roller 48 is in fully engaged position with the seat 52 being yieldingly held in this position by means of the leaf spring 51 thus maintaining the strip guide in its correct operative position so as to avoid undue friction or binding action to the feeding movement of the strips. The detent device for the strip guide can be quickly and easily released when it is desired to adjust the guide to inoperative position merely by raising the guide plates 39 whereupon the detent rollers 48, due to their rounded surfaces, are caused to be lifted slightly against the tension of the springs 51 and to move out of the detent seats 52 into engagement with the peripheral surface of the transverse tie rod 34.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

The invention having thus been fully described, the following is claimed:

1. In a strip feeding mechanism for machines of the character described, in combination, a platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips and positioned for engagement in feeding and aligning relation with said strip apertures in substantial alignment with the writing line of said platen, and a belt support positioned beyond said platen over which said belt travels to position it in a path diverging from said cylindrical writing surface beyond said writing line and substantially in a diverging part of the strip path whereby a plurality of said feed pins including a pin in substantial alignment with the writing line, and one or more pins in said diverging path are simultaneously in full strip feeding engagement, causing the strips to be pulled over the platen and aligned at the writing line.

2. In a strip feeding mechanism for machines

of the character described, in combination, a platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips and positioned for engagement in feeding and aligning relation with said strip apertures in substantial alignment with the writing line of said platen, and means including spaced belt supports over which the belt travels for mounting and positioning said traveling belt to cause said feed pins to enter in serial order into engagement with said strip feed apertures at the inner sides of the strips and intermediate the ends of an arc of the strips which is in engagement with said cylindrical platen surface.

3. In a strip feeding mechanism for machines of the character described, in combination, a platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips and positioned for engagement in feeding and aligning relation with said strip apertures in substantial alignment with the writing line of said platen, means including spaced belt supports over which the belt travels for mounting and positioning said traveling belt to cause said feed pins to converge with said strips and to enter in serial order into engagement with said strip feed apertures at the inner sides of the strips and intermediate the ends of an arc of the strips which is in engagement with said cylindrical platen surface, and means for mounting said feed pins on said belt to cause the aperture entering parts thereof to travel substantially at the same speed as the strips when entering the respective feed apertures.

4. In a strip feeding mechanism for machines of the character described, in combination, a platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips and positioned for engagement in feeding and aligning relation with said strip apertures in substantial alignment with the writing line of said platen, means for mounting and positioning said traveling belt to cause said feed pins to travel in a curved path converging with the strips at the inner sides thereof and to enter in serial order while traveling in said curved path into engagement with said strip feed apertures at points intermediate the ends of an arc of the strips which is in engagement with said cylindrical platen surface, and means for mounting said feed pins below the pitch surface or pitch line of said traveling belt to cause the aperture entering parts thereof to travel substantially at the same speed as the strips when entering the respective feed apertures.

5. In a strip feeding mechanism for machines of the character described, in combination, a platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips and positioned for engagement in feeding and aligning relation with said strip apertures in substantial alignment with the writing line of said platen, a belt support adjacent to an end of the platen and having adjacent concentric belt supporting parts eccentric with the platen for mounting and positioning said traveling belt to cause said feed pins to travel in a curved path converging with the strips at the inner sides thereof and to enter in serial order while traveling in said curved path into engagement with said strip feed apertures at the inner sides of the strips and intermediate the ends of an arc of the strips which is in engagement with said cylindrical platen surface, near to and just below the writing line thereof and being substantially fully engaged with the feed apertures at said writing line so as to maintain the strips in alignment at said line, and means for mounting said feed pins below the pitch surface or pitch line of said traveling belt to cause the aperture entering parts thereof to travel substantially at the same speed as the strips when entering the respective feed apertures.

6. In a strip feeding mechanism for machines of the character described, in combination, a rotary platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, and supporting means including spaced belt supports over which the belt travels, one of said belt supports being positioned adjacent to an end of said platen and supporting said traveling belt adjacent to said platen end so said feed pins travel in a path converging at the inner sides of strips with the path of the length of said strips which engages said platen, and causing said pins to enter in serial order into engagement with said strip feed apertures at points intermediate the ends of said platen-engaging strip length to feed and align the strips.

7. In a strip feeding mechanism for machines of the character described, in combination, a rotary platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, and supporting means including spaced belt supports over which the belt travels, one of said belt supports being positioned adjacent to the end of said platen and adjacent to the writing line thereof and having adjacent concentric belt supporting parts eccentric with the platen for supporting said traveling belt so said feed pins travel in a path converging at the inner side of the strips with the path of the length of said strips which engages said platen, causing said pins to enter into engagement with said strip feed apertures near to said writing line to feed the strips and to align them at said writing line.

8. In a strip feeding mechanism for machines of the character described, in combination, a rotary platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, supporting means including adjacent concentric belt supporting parts eccentric with the platen and positioned adjacent to the end of said platen and supporting said traveling belt so said feed pins travel in a curved path converging with the curved path of strips on said platen at the inner side of said strips, and causing said pins to enter into engagement with said strip feed apertures at said curved strip path to feed and align the strips, and brackets movably guided and supported by one of said concentric belt supporting parts and mounting said feed pins on said belt to cause the aperture entering parts thereof to travel substantially at the same speed as the strips when entering the respective feed apertures.

9. In a strip feeding mechanism for machines

of the character described, in combination, a rotary platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, supporting means including a belt supporting part eccentric with the platen and positioned adjacent to the end of said platen and adjacent to the writing line thereof and supporting said traveling belt so said feed pins travel in a curved path converging with the curved path of strips on the platen at the inner side of said strips, causing said pins to enter into engagement with said strip feed apertures near to and just below said writing line to feed and align the strips at the writing line, and brackets movably guided and supported by said eccentric supporting part and mounting said feed pins on said belt to cause the aperture entering parts thereof to travel substantially at the same speed as the strips when entering the respective feed apertures.

10. In a strip feeding mechanism for machines of the character described, in combination, a rotary platen having a cylindrical writing surface, an endless flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, and supporting means including belt supports spaced longitudinally of said belt over which the belt travels, one of said belt supports being positioned adjacent to the end of said platen and having a curved supporting surface eccentric to the center of rotation of said platen and supporting said traveling belt so said feed pins travel in a path converging with the path of strips on the platen at the inner side of said strips, causing said pins to enter into engagement with said strip feed apertures to feed and align the strips.

11. In a strip feeding mechanism for machines of the character described, in combination, a platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, supporting means positioned adjacent to the end of said platen and supporting said traveling belt so said feed pins travel in a path converging with the arc or curved length of strips engaged on said platen at the inner side of said strips, and causing said pins to enter in serial order into engagement with said strip feed apertures at said arc or strip length to feed and align the strips, and supporting means supporting said traveling belt in a path along the strips diverging with the platen surface beyond said arc or strip length and maintaining the feed pins as they pass beyond said arc or strip length in full feeding engagement with the strips so as to align them and pull them with a tractive effort over the platen.

12. In a strip feeding mechanism for machines of the character described, in combination, a platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, supporting means positioned adjacent to the end of said platen and adjacent to the writing line thereof and supporting said traveling belt so said feed pins travel in a path converging with the path of strips on the platen at the inner side of said strips, causing said pins to enter in serial order into engagement with said strip feed apertures near to and just below said writing line to feed and align the strips at the writing line, and supporting means supporting said traveling belt in a path diverging along the strips from the platen surface beyond said writing line and maintaining a plurality of said feed pins at the writing line and said diverging path simultaneously in full feeding engagement with the strips to align them and pull them with a tractive effort over the platen.

13. In a strip feeding mechanism for machines of the character described, in combination, a platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, supporting means positioned adjacent to the end of said platen and having a curved supporting surface eccentric to said cylindrical writing surface and over which said belt travels and is supported so said feed pins travel in a path converging with the path of strips on the platen at the inner side of said strips, causing said pins to enter in serial order into engagement with said strip feed apertures to feed and align the strips, and supporting means supporting said traveling belt in a path diverging along the strips from the platen surface and maintaining a plurality of said feed pins simultaneously in full feeding engagement with the strips as said strips pass beyond the platen and enter into said diverging path so as to align and pull the strips with a tractive effort over the platen.

14. In a strip feeding mechanism for machines of the character described, in combination, a platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, supporting means positioned adjacent to the end of said platen and having a curved supporting surface eccentric to the center of rotation of said platen and supporting said traveling belt so said feed pins travel in a path converging with the path of strips engaged on the platen at the inner side of said strips, causing said pins to enter into engagement with said strip feed apertures to feed and align the strips, said supporting means also having a belt supporting surface diverging with said eccentric surface thereof and supporting said traveling belt in a path diverging from said cylindrical writing surface beyond said writing line whereby a plurality of said feed pins as they pass from said platen into said diverging path remain simultaneously in full feeding engagement with the strip apertures to feed and align the strips.

15. In a strip feeding mechanism for machines of the character described, in combination, a platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, means for mounting and positioning said traveling belt to cause said feed pins to travel in a curved path converging with the inner side of an arc or loop of the strips which is in engagement with said cylindrical platen surface and to cause said pins to enter into feeding and aligning engagement with said feed apertures at said arc of the strips, and guide means positioning said traveling belt beyond said strip loop in a diverging path so as to maintain said feeding pins as they travel from said strip loop into said divergent path in full feeding engagement with said apertures.

16. In a strip feeding mechanism, in combination, a platen having a cylindrical writing sur-

face, a flexible traveling sprocket chain carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, and chain supporting means positioned in longitudinal alignment with said platen and having a curved support eccentric to said cylindrical writing surface and supporting said sprocket chain for movement thereover in a path eccentric to said writing surface to effect feeding engagement of said feed pins in the strip apertures, said sprocket chain supporting means also having an elongated chain supporting surface diverging from said cylindrical writing surface for supporting an elongated reach of said chain in a divergent path so as to cause the strips to travel beyond the writing line of the platen in a path diverging with their path on the cylindrical writing surface and to maintain said feed pins as they travel from said eccentric support onto said diverging supporting surface in full feeding engagement with said feed apertures.

17. In a strip feeding mechanism, in combination, a platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, and supporting means including two adjacent concentric curved supports of different radii and eccentric to the cylindrical platen surface for supporting said traveling belt for movement of the feed pins carried thereby in a path eccentric to said cylindrical surface and converging with the path of the strips on said surface to effect feeding engagement of said feed pins in the feed apertures at the inner sides of the strips, said belt supporting means also including an elongated belt supporting surface diverging from said cylindrical surface for supporting an elongated reach of said belt in a divergent path with the feed pins still in full feeding engagement with the feed apertures so as to cause the strips to travel beyond the writing line of the platen in a path diverging with their path on the cylindrical platen.

18. In a strip feeding mechanism, in combination, a rotary platen having a cylindrical writing surface, a flexible traveling sprocket chain carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, said sprocket chain having a series of laterally disposed pin supporting brackets positioned within the pitch line of the sprocket chain, and supporting means positioned in longitudinal alignment with said platen and having two adjacent supporting surfaces one of which is curved and eccentric to the platen surface and supporting said sprocket chain for feeding movement, the other of said supporting surfaces having a curved part concentric with said eccentric surface and an elongated part diverging from said curved part thereof and engaging said pin supporting brackets for supporting them and the feed pins carried thereby in a divergent path so as to cause the strips to travel beyond the writing line of the platen in a path diverging with their path on the cylindrical platen.

19. In a strip feeding mechanism, in combination, a rotary platen having a cylindrical writing surface, a flexible traveling belt having supporting brackets carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, and supporting means positioned in longitudinal alignment with said platen and having a curved belt support over which said belt travels, said supporting means also including a curved supporting surface concentric with said curved belt support and eccentric to the center of rotation of said platen and of shorter radius than that of the platen and engaging and guiding said supporting brackets so said feed pins travel in a path converging with the path of strips on the platen at the inner side of said strips, causing said pins to enter into engagement with said strip feed apertures to feed and align the strips.

20. In a strip feeding mechanism, in combination, a platen having a cylindrical writing surface, a flexible traveling sprocket chain carrying a series of feed pins engaging in feeding and aligning relation in feed apertures in the strips, and supporting means positioned in longitudinal alignment with said platen and having a curved supporting surface eccentric to said cylindrical writing surface and supporting said sprocket chain for movement thereover in a path eccentric to said writing surface and converging with an arc or loop of the strips supported on said cylindrical surface to effect feeding engagement of said feed pins in the feed apertures at said strip loop, said curved supporting surface being of shorter radius than that of said cylindrical writing surface, said sprocket chain supporting means also having an elongated chain supporting surface diverging from the curved surface thereof and from said cylindrical surface for supporting an elongated reach of said chain in a divergent path thus maintaining the feed pins engaged in the feed apertures at said strip loop on the platen surface continuously in full feeding engagement with the strips as the pins travel onto and along said divergent path.

21. In a strip feeding mechanism, in combination, a rotary platen having a cylindrical writing surface, a flexible traveling belt carrying a series of feed pins engaging the strips in feeding and aligning relation therewith, means for mounting said traveling belt to cause said feed pins to move in a curved path eccentric to said cylindrical platen surface, said mounting means being positioned to cause said pins to travel in a path converging with the inner side of the strips on said cylindrical surface whereby the pins move into feeding engagement with the strips positioned on said cylindrical surface, and belt supporting and guiding means positioned beyond the point where the pins move into strip feeding engagement for causing an elongated reach of said belt and the feed pins carried thereby to travel in a path diverging with said cylindrical platen surface beyond the writing line thereof and to maintain said feed pins in full feeding engagement with the strips as the latter travel along said cylindrical surface and to and along said diverging path.

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