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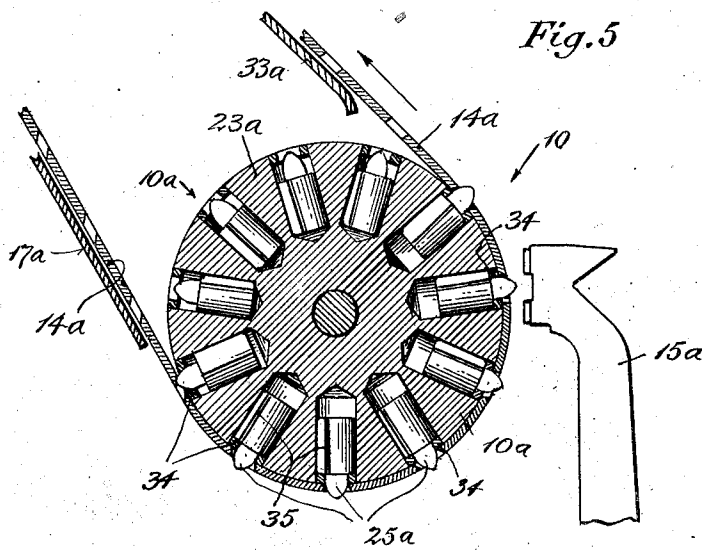
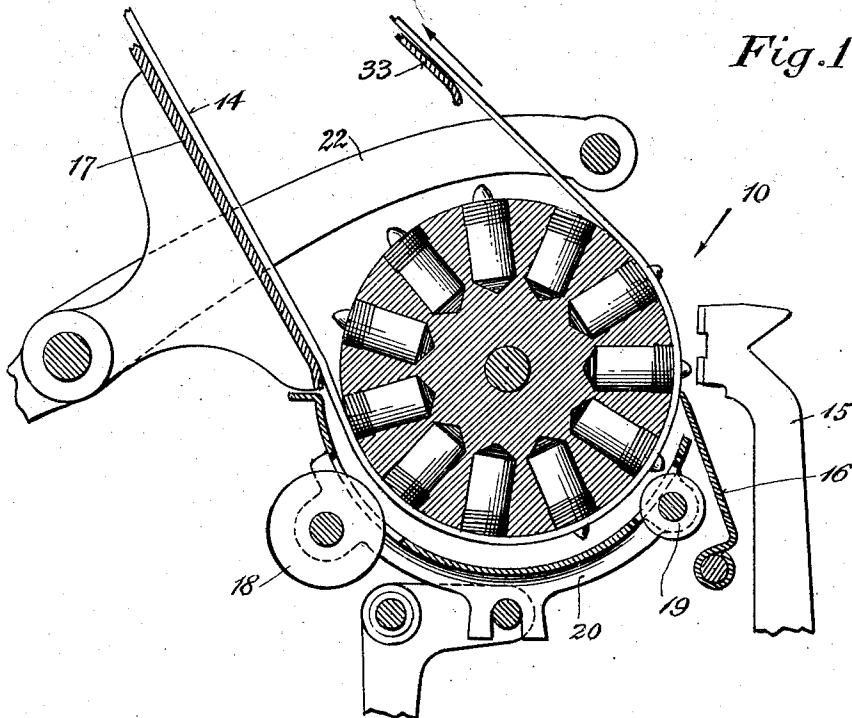
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PIN TYPE PAPER FEEDING DEVICE

Filed Dec. 16, 1943

2 Sheets-Sheet 1



INVENTOR

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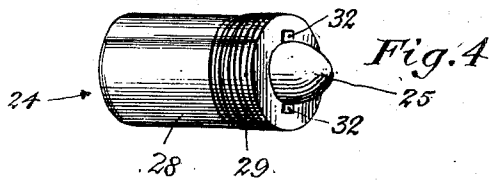
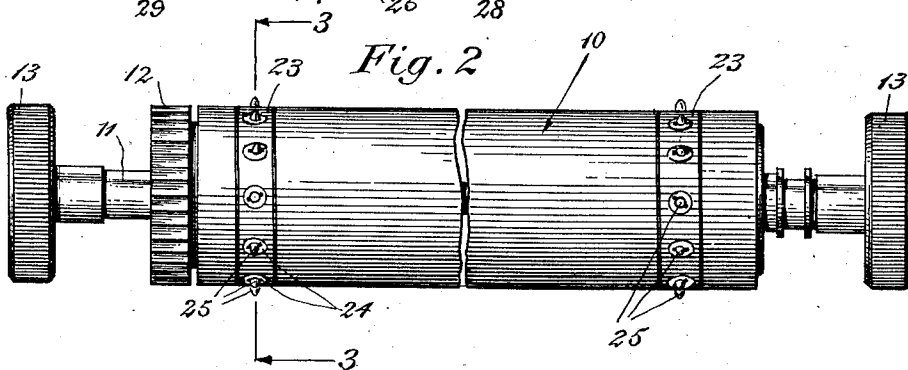
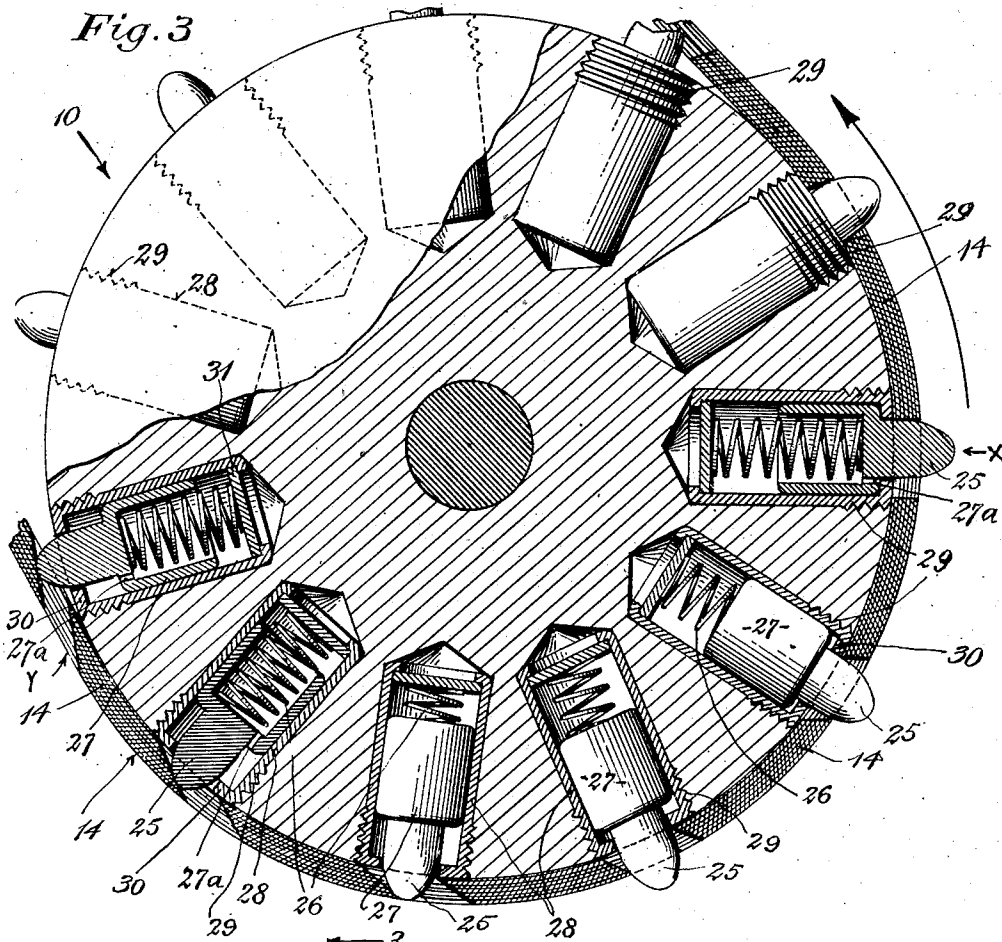
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PIN TYPE PAPER FEEDING DEVICE

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2 Sheets-Sheet 2



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PIN TYPE PAPER FEEDING DEVICE

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1

This invention relates to typewriters and the like, and more especially to machines of the type adapted to handle continuous superposed strips, where it is desired to keep all of the strips substantially in registry and alignment as they advance through the machine.

Various devices have been incorporated in typewriters in the past to establish and maintain continuous superposed printed record and carbon strips in alignment and registry. For this purpose the strips have been provided with rows of equi-spaced feeding perforations along the marginal area, for engagement with protuberances or pins carried by the typewriter usually by the platen. By arranging the pins and the feeding perforations so that as the platen is turned the pins consecutively enter the perforations of the advancing superposed strips, the latter are kept in practically sufficient registry and alignment at the platen.

When, however, the number of strips or the thickness of the pile passing simultaneously through a typewriter is increased beyond a certain amount, and the perforations in the strips are aligned at the writing line, those at the introductory side of the platen will be out of alignment with each other. This is because, as the strips bend around the platen, the innermost strip has an arc of smaller radius than the arc of the outermost strip, and therefore with any given central angle representing two pins on the platen, the corresponding arcs for the inner and outer strips are different in length. Thus the perforations in the strips at the introductory side of the platen become misaligned an amount proportional to the thickness of the pile, depending on the number and thickness of strips used simultaneously. This condition results, at the introductory side of the platen, in the strips riding up on the tips of the pins and being spaced from the platen, or being torn by the pins as the latter is turned.

The problem above is well known, and various solutions have been proposed and adopted to overcome it. Usually these have involved more or less extensive changes in and additions to the construction and arrangement of the feeding mechanism of the typewriter, and there has therefore been an undesirable attendant cost of installation and maintenance.

According to the present invention the problem is solved in a novel manner that requires but few and inexpensive parts, with very little or no change being necessary in the usual feed-

2

ing mechanism of the typewriter. Moreover, a more reliable feeding of the superposed strips is effected, and registry and alignment of the strips at the writing line is assured at all times.

This is accomplished by providing feeding pins for engagement with the perforations of the superposed strips, which pins are yieldably mounted for retracting movement and yieldably urged toward extended position, while at the same time being rotatably movable for feeding the strips through the machine. With this arrangement, as the strips advance toward the platen with the perforations out of alignment, they engage the advancing yielding pins at the points where the perforations are misaligned. The pressure of the strips on the pins cause the latter to retract as the advancing movement continues, without tearing or otherwise interfering with the strips. However, the pins are being continuously yieldably urged toward extended perforation-engaging position during the advancing movement, and as the perforations become nearly in registry, the pins enter said perforations and assume the feeding and registry operations of the sheets.

In one illustrated form of the invention, the pins are mounted around the circumference of the platen so as to be individually and independently retractable and extendable, and are yieldably urged radially outward by coil springs. In another form of the invention the pins are freely movable outwardly and inwardly and are urged outwardly and inwardly by their weight and the force of gravity as the platen makes a complete revolution.

There is thus provided improved paper-engaging and feeding means in the form of pins which, being yieldable, respond to light pressures such as would be exerted on them by the superposed strips advancing into the machine so that they move to a retracted position and do not tear or otherwise interfere with the normal travel of the strips, and yet which enter the feeding perforations of the strips as the latter become more nearly in registry in their travel around the platen.

It should be noted that the pins are controlled in their extending movement by the paper strips themselves, and that the extent of registry of the perforations is the determiner of when the pins shall enter the latter and begin to assume the registration and the feeding load. Thus, there is an automatic compensation which takes place as thick or thin piles of strips are used in the machine. When thick piles of strips are fed into

the machine, the pins will be prevented from fully entering all the perforations until the latter come almost in registry sometime before the writing line is reached. However, when a thin pile of strips is fed through the machine, the pins will fully enter the perforations when, or shortly after, the strips contact the introductory side of the platen well in advance of the writing line. This is an important feature of the invention, inasmuch as it provides for a larger number of pins engaging and pulling the pile of strips when it is comparatively thin and more liable to tear. When a thick pile of strips is used in the machine, it is not necessary to have as large a number of pins extend through the perforations for pulling the strips, since tearing of the paper is less likely to occur during feeding.

A feature of the invention is that the typewriter need be modified only by the removal of the plain platen and the substitution of the platen of this invention in order to incorporate the improved feed described herein.

Another feature of the invention is the provision of individual pin and spring assemblies, in the preferred form, which are interchangeable and easily removable and replaceable and which can be initially adjusted for proper spring tension at the time of fabrication.

Other features and advantages will hereinafter appear.

In the accompanying drawings showing the several embodiments of the invention—

Figure 1 is a transverse sectional view of the improved feed applied to a typewriter.

Fig. 2 is a plan view of a typewriter platen embodying one form of the invention.

Fig. 3 is an enlarged fragmentary section taken on the line 3—3 of Fig. 2, also showing superposed strips extending around the platen.

Fig. 4 is a perspective view of one of the pin-assembly inserts of Figs. 1, 2 and 3.

Fig. 5 is a transverse sectional view showing another embodiment of the invention.

Referring to Figs. 1 and 2, a typewriter platen 10 is carried on a shaft 11 having a line spaced ratchet 12 and knobs 13. The platen 10 supports continuous superposed paper strips 14 fed into a typewriting machine so that the strips can receive impressions from type bars 15 or other suitable imprinting devices along a line of writing indicated by a letter-gauge plate 16, which is pivotally mounted and spring-urged against the platen in the usual manner.

The typewriter has the usual paper table 17, and paper-engaging lower rollers 18 and 19 mounted on a carrier arm 20. To prevent crumpling of the pile of superposed strips 14, the carrier arm 20 and the rollers 18 and 19 are lowered as shown to a position so that the rollers do not engage the strips passing around the platen.

To adapt the typewriter to the present invention, the usual platen is removed from the carriage of the machine by the release of convenient and well-known means. A platen 10 provided with improved and novel feed pin assemblies for feeding the superposed strips is replaced in the carriage.

The usual type of platen for feeding superposed strips has pins which are either fixed with respect to the platen, or are positively automatically retractible and extendable. In the case of the fixed pins, where the number of superposed strips is small, the operation has been generally satisfactory. However, when using a large number of strips, with a platen having fixed pins, there is

a tendency for the strips to ride up on the tips of the pins and become torn at the point where the strips would initially engage the platen.

The reason for this can be readily seen by referring to Fig. 3. This shows an enlarged section of a platen having seven superposed strips extending around it, each of the strips being perforated along its margin, and the perforations being equally spaced. At the writing line, designated by the letter X, the perforations of the strips are shown to be in perfect registry. Further up on the platen as the strips begin to leave the latter, it will be noted that the perforations have become misaligned. At the lower left-hand introductory side of the platen, the perforations in the strips have also become misaligned, but in the opposite direction. This misalignment is due to the fact that the innermost strip follows an arc which has a smaller radius than the arc of the outermost strip, and, therefore, for any given central angle representing two pins, the arcs of the innermost and outermost strips have different lengths. Inasmuch as the arcs represent linear distances on the strips, and since these linear distances are different for each different strip, while the spaces between the perforations remain the same for all strips, it is obvious that a misalignment of perforations must occur.

Normally this misalignment would not affect the data types on the strips if the latter are not torn, since the type strikes the strips at or near the point marked X where the strips are in perfect registry (Fig. 3). However, if the strips become torn at the point designated by the letter Y, where they initially advance onto the platen, there will no longer be registry at the writing line.

According to the present preferred form of the invention, referring to Fig. 2, this undesirable condition is obviated by providing the platen 10 with a pair of disks 23 having a plurality of radially extending recesses carrying improved pin assemblies 24, including individually retractible pins 25. The pins 25 are slidably mounted with respect to the platen 10 in such a manner that, as the strips 14 are fed onto the platen at the introductory side thereof, the pins yield under the pressure of the strips and the latter advance onto the platen without tearing or interference.

In the embodiment represented by Figs. 1, 2, 3 and 4, the pins 25 are yieldingly urged radially outward by helical coil springs 26, the tension of the latter being initially adjusted to a value that pressure of the strips on the pins at the introductory side of the platen will cause the pins to retract, and yet as the platen continues its turning and the perforations become more nearly in registry, the pins will be urged radially outward so as to extend through the perforations and take up the feeding of the strips. Therefore, it will be seen that the strips are kept in perfect registry at the writing line where the typing is impressed; and at other points where the strips and pins engage each other, the strips remain flat and close to the surface of the platen, and are not torn.

Referring to Figs. 2 and 3, the pins 25 are provided with large hollow bodies 27 having vent holes 27a, the bodies slidably fitting within tubular holders 28 carried in recesses of disks 23 connected to the platen 10. The holders 28 are externally threaded at 29 near their outer ends so that they may be screwed into the recesses of the disks 23, which are tapped for this purpose, and said holders are provided with inwardly extending flanges 30, which act as stops to prevent the pins 25 from leaving the holders. The inner ends of

5

the coil springs 26 engage small circular plates 31, which are retained in the holders by turning in the inner ends of the holders as shown. Preferably, the recesses in the disks 23 are bored to a fixed depth so that the tubular holders for the pins may be screwed down tightly to bottom in the recesses and at the same time fit flush at the outer end with the circular faces of the disks.

It is seen that the pins 25 and tubular holders 28 form complete assemblies, and, as such, the spring pressure in each assembly may be individually initially checked and maintained between acceptable limits.

The inwardly extending flange of each tubular holder 28 is provided with a pair of oppositely disposed diametrically located cuts 32 (Fig. 4), to provide a grip for a wrench, and the tips of the pins 25 are rounded off in the usual manner to facilitate entry into the perforations of the strips and removal therefrom.

It will be seen that at the writing line of the strips, Figs. 1 and 3, the pins 25 extend entirely through the perforations so that at this point the strips are substantially in perfect registry. Although the strips are not in registry at the introductory side of the platen and at the delivery side of the platen, if there is no tearing of the strips, this misalignment is of no consequence as far as the actual typing is concerned.

The spring tension on the letter gauge 16 is adjusted to a value such that the plate will yield before disturbing the pins 25 should the latter move against the plate at any time.

For the purpose of insuring a smooth disengagement of the strips 14 from the pins 25 at the delivery side of the platen, a stripper 33 is provided in the form of a plate located substantially directly over the platen.

Another embodiment of the invention is shown in Fig. 5 wherein a plurality of strip-engaging pins 25a are carried in disks 23a or a platen 10a so as to be freely radially movable therein from retracted to extended position, and vice versa, under their own weight. Continuous writing strips 14a are fed over a paper table 17a and around the disks 23a and platen 10a, to receive impressions from type bars 15a. According to this embodiment, as the disks 23a and the platen 10a rotate in a counter-clockwise direction, the pins approaching the strips 14a, which are advancing onto the platen, are influenced by gravity in such a manner as to be urged radially outward. Inasmuch as the pressure exerted by the pins on the strips due to the attraction of gravity is a yielding pressure, and of comparatively small magnitude, the strips will move the pins radially inward against this pressure and toward the retracted position, and the strips will therefore not be torn or displaced from the face of the platen. However, as the platen and disks continue turning, and the perforations in the strips 14a become more nearly in registry, the tips of the pins 25a will begin to extend through the perforations under the urging of their own weight; as the turning is further continued a point is reached where the pins will extend entirely through the perforations, and take up the feeding of the strips. From this point until the strips leave the delivery side of the platen, the pins will function to feed and maintain the strips in registry for typing.

In the embodiment shown in Fig. 5, the pins 25a are preferably solid with large bodies, so as to have sufficient weight, and are slidably carried in the radially extending recesses in the disks 23a or platen 10 in such a manner as to not project

6

therefrom when in retracted position. The enlarged bodies of the pins form shoulders thereon, and the pins are prevented from falling out of the disks 23a by means of small rings 34, which are pressed in place flush with the surface of the disks and are adapted to engage said shoulders. Preferably, the fit of the rings is such as to permit their being easily removed should it be desired to clean or replace the pins. The bodies of the pins have air-vent grooves 35 to insure quick moving of the pins.

A stripper plate 33a is provided at the delivery side of the platen 10a and disks 23a to disengage the strips at this point.

I have found that by properly choosing the weights of the pins 25a, the latter can be made to function without tearing or interfering with the strips 14a advancing on the platen, and yet the weight of the pins will exert sufficient pressure to cause the tips thereof to enter the perforations in the strips at the proper moment.

For the purpose of simplicity the superposed strips 14 and 14a, Figs. 1 and 5, are shown as a single strip, although it should be understood that actually there are a number of superposed strips involved.

Variations and modifications may be made within the scope of this invention and portions of the improvements used without others.

I claim:

1. In a typewriter, a platen adapted to support for writing operations a plurality of superposed continuous writing strips having registered feeding apertures; a plurality of equi-spaced pins mounted to travel along the path of the writing strips and engage the feeding apertures in said strips and positioned to advance the latter in registration over the platen, each of said pins being mounted to move outwardly to aperture-engaging position from a retracted position, said pins being yieldably restrained solely by said strips from moving outwardly into said feeding apertures until the latter are aligned sufficiently to receive them without the strips being torn.

2. In a typewriter, a platen and means for feeding continuous superposed writing strips past a given point, including a rotatably mounted feed pin holder; a plurality of feed pins adapted to enter feeding perforations of the strips; and means responsive to gravitational attraction for operating each of said pins consecutively and independently of the others, as the holder is turned, to move the pins under a yielding force alternately to extended strip-engaging position and then to retracted non-strip-engaging position.

3. In a typewriting machine, a movably mounted holder to carry feeding pins for engagement with continuous superposed writing strips passing through the machine; means connected with the typewriter platen for moving the holder in response to turning of the platen; a plurality of strip-feeding pins; and means responsive to gravitational attraction for actuating said pins, including means for mounting same on the holder, to provide for unobstructed extending and retracting movement of the pins between predetermined limits as the holder is moved.

4. In a typewriter, means for feeding continuous superposed perforated writing strips past a given point, including a rotatable platen; a plurality of pins adapted to enter perforations of the strips for feeding the latter; and means responsive to gravitational attraction for operating said pins, including means for mounting same on the platen, to provide for unobstructed extending and

7

retracting movement of the pins between predetermined limits as the platen is turned.

5. In a typewriter, means for feeding continuous superposed perforated writing strips past a given point, including a rotatable platen; a plurality of pins adapted to enter perforations of the strips for feeding the latter; and means for operating said pins in response to turning of the platen so that the pins will be yieldingly urged from an initial retracted position to an extended strip-engaging position and simultaneously laterally moved along the path of the strips for feeding the strips during part of the turning movement of the platen, and yieldingly urged toward the initial retracted position during another part of the turning movement of the platen.

6. In a typewriter, a cylindrical rotatable platen adapted to support for writing operations a plurality of superposed continuous writing strips which pass underneath and upwardly in front of the platen and have registered feeding apertures; a plurality of pins; and means for mounting the pins radially on the platen to travel along the path of the writing strips and engage the feeding apertures in said strips to advance the latter in registration, each of said pins being movable to and from a strip-engaging position from a retracted non-strip-engaging position, and being at all times yieldable for restraint by said strips from moving outward into said feeding apertures if the latter are not aligned sufficiently to receive them without the strips being torn, the pins being yieldably urged radially outward where the feeding apertures of the strips become aligned at the under part of the platen and being yieldably urged radially inward toward retracted position at the top of the platen.

7. In a typewriter, a cylindrical rotatable platen adapted to support for writing operations a plurality of superposed continuous writing strips which pass around the platen and have registered feeding apertures, said platen having a plurality of circularly disposed radially extending holes; a plurality of sleeves, each sleeve being mounted in one of the holes of the platen for easy removal therefrom, and having at its external end an inwardly extending flange; a plurality of pins slidably carried in the sleeves, each pin having a tip of reduced diameter adapted to engage the feeding apertures of the strips, and having a larger tubular body providing a shoulder for engagement with the flange of the sleeve to act as a stop; a plurality of helical coil springs carried in the sleeves and extending into the tubular bodies of the pins to yieldably urge the latter outward; and closure means connected to the inner ends of the sleeves for engaging the inner ends of the coil springs.

8. In a typewriter, a cylindrical rotatable platen adapted to support for writing operations a plurality of superposed continuous writing strips which pass around the platen and have registered feeding apertures, said platen having a plurality of circularly disposed radially extending holes; a plurality of pins slidably carried in the holes, each pin having a tip of reduced diameter adapted to engage the feeding apertures of the strips, and having a larger body providing a shoulder on the pin; and a plurality of rings carried in the holes of the platen, and through which the tips of the pins can project, said rings being adapted to engage the shoulders of the pins to act as stops for the latter.

9. In a typewriting machine having feeding means and paper guiding means whereby a pile

8

of continuous superposed paper strips is guided in a curved path in being fed, said strips having rows of spaced marginal feed holes thrown out of normal registration depthwise of the pile as the latter follows said curved path, said feeding means including feeding pins for engaging said feed holes and a carrier for traveling the pins in said curved path, said pins being each individually mounted for movement outwardly to a projected paper-feeding position and inwardly to a retracted non-feeding position, and said feeding means including means tending to move the pins from retracted position to projected position when following said curved path of the strips, said pins being moved inwardly solely by the pressure of the paper strips against their ends or being held from projection by the pressure of the paper.

10. In a typewriting machine having feeding means and paper guiding means whereby a pile of continuous superposed paper strips is guided in a curved path in being fed, said strips having rows of spaced marginal feed holes thrown out of normal registration depthwise of the pile as the latter follows said curved path, said feeding means including feeding pins for engaging said feed holes and a carrier for traveling the pins in said curved path, said pins being each individually mounted for movement to a projected feeding position and to retracted non-feeding position, and said feeding means including means to move the pins from retracted position so that they tend to occupy projected positions when following said curved path of the strips, said means being so weak in its action that the pressure of the paper strips against the ends of the pins prevents their moving to or remaining in projecting position unless and until the feed holes are aligned as the paper is fed.

11. In a typewriting machine having a cylindrical rotatable platen, feeding means, and paper guiding means whereby a pile of continuous superposed paper strips is guided in a curved path in being fed around the platen, said strips having rows of spaced marginal feed holes thrown out of normal registration depthwise of the pile as the latter follows said curved path, said feeding means including feeding pins for engaging said feed holes, and a carrier for the pins mounted on the platen and rotating therewith, said pins being each individually mounted for movement to a projected paper-feeding position and to a retracted non-feeding position, and said feeding means including springs to move the pins from retracted position so that they tend to occupy projecting positions when following said curved path of the strips, said spring being so weak that the pressure of the paper strips against their ends prevents their moving to or remaining in projecting position unless and until the feed holes are aligned as the paper is fed.

12. In a typewriting machine having feeding means and guiding means for a pile of continuous superposed paper strips having rows of spaced marginal feed holes normally in registration depthwise of the pile, said feeding means including feeding pins for engaging said feed holes and a carrier for the pins, said pins being each individually mounted for movement to a projected paper-feeding position and to a retracted non-feeding position, and said feeding means including springs to move the pins from retracted position to projecting position and being so weak

2,432,967

9

that the pressure of the paper strips against the ends of the pins move the pins from projected to retracted position when the feed holes are out of alignment.

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5

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