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FEEDING MEANS FOR RECORDING MACHINES

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Fig.5

Fig.6

Fig.7

Fig.8

Fig.9
This invention relates to writing machines, and more particularly, to paper feeding means for positively feeding superposed strips of manifolding material of different widths while maintaining corresponding portions of the several sheets in accurate alignment and registry with each other.

The present embodiment of the invention includes a platen roll which is interchangeable with the usual friction feed type of platen roll ordinarily found in writing and computing machines with which are associated pin wheel units, the feeding pins of which are engageable in series punched holes in the record material and which are axially adjustable toward and from each other to agree with material of different widths, the pin wheel units being rotatable in unison in all positions of axial adjustment.

The feeding pins of the several units are retractably mounted for progressive projection into and withdrawal from engagement with series punched holes in the writing material in unison with rotation of the platen roll and further are caused to be projected at effective and ineffective positions at will whereby the material may be fed either positively by such pin wheel units or frictionally by the usual pressure rollers cooperating with the platen roll.

The pin wheel units having retractable feeding pins with means for varying the position at which the pins are projected, per se forms the subject matter of Letters Patents of the United States, Nos. 2,000,649 and 2,000,651, to which cross reference is made.

In the present instance there is shown a platen roll with which is associated one pin wheel unit while a second pin wheel unit is axially adjustable in parallel offset relation with the platen roll, with which it is operatively connected for unison rotation.

The object of the invention is to simplify the construction as well as the means and mode of operation of positive feeding devices for writing machines whereby they may not only be economically manufactured, but will be more efficient in use, automatic in action, uniform in operation, capable of a wide range of adjustment and unlikely to get out of repair.

A further object of the invention is to provide a pin wheel type of feeding mechanism applicable to typewriters, computing and recording machines which will be interchangeable with the usual frictional type platen roll with which such machines are originally equipped.

A further object of the invention is the provision of feeding mechanism readily adaptable for positively feeding record material of different widths.

A further object of the invention is to provide a platen roll and axially adjustable pin wheel units cooperating therewith.

A further object of the invention is to provide positive feeding means for different widths of writing material usable alternately with frictional feeding means therefor having the advantageous features and desirable characteristics hereinafter described.

With the above primary and other incidental objects in view, as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof, and the mode of operation, or its equivalent, as hereinafter described and set forth in the claims.

Referring to the accompanying drawings wherein is shown the preferred, but obviously not necessarily the only form of embodiment of the invention,

Fig. 1 is a perspective view of a conventional typewriter to which the present invention has been applied.

Fig. 2 is a top plan view of the platen roll and pin type feeding assembly.

Figs. 3 and 4 are detail end elevations viewed in opposite directions.

Fig. 5 is a perspective view of the platen roll and pin type feeding assembly removed from the writing machine.

Fig. 6 is a top plan view of the assembly illustrated in Fig. 5.

Figs. 7 and 8 are transverse sectional views illustrating the positive pin type feeding means and the frictional feeding means in alternate condition.

Fig. 9 is a longitudinal sectional view of a positive pin type feeding device and the adjusting means therefor.

Typewriters, recording and computing machines and other writing machines are ordinarily equipped with platen rolls of the friction type about which writing material is advanced by pressure rollers frictionally engaging the underside of the platen roll. However, in the manifolding of copies upon superposed sheets of writing material much difficulty has been experienced in maintaining printed forms upon the superposed record strips in accurate alignment and registry with each other. The present strip feeding mechanism provides means for positively feeding superposed record strips in accurate reg-
istry and alignment with each other and is interchangeable with the usual friction type platen roller ordinarily found in writing machines. It cooperates with the usual pressure rollers for frictionally feeding writing material alternately with the positive feeding thereof by the pin wheel units. In the preferred form of embodiment as illustrated in the drawings, the apparatus comprises a main shaft 1 to be journaled in the bearings of the platen carriage of the writing machine from which the usual platen roll has been removed. Mounted upon the shaft 1 is a pin wheel unit 2 which comprises a rotary head 3 having therein radial bores 4 in which are located reciprocatory taper pointed feeding pins 5. The pin wheel unit 2 is fixedly secured upon the shaft 1 by a set screw 6 carried in a hub 7 projecting from the lateral face of the pin wheel unit. Associated with the pin wheel unit 2 and connected thereto for unison rotation, is the platen roll 12. Surrounding the shaft 1 is a concentric sleeve 8 capable of a limited circular motion, although it is normally stationarily held in one position or the other of such rocking adjustment. Carried upon the rock sleeve 8 is an eccentric cam 23 interiorly of the pin wheel unit 2. The eccentric cam 23 is provided with a lateral flange 24 engaging within bores in the reciprocatory feeding pins 5 of the pin wheel unit. The pin wheel unit is connected to the shaft 1 and also connected with the platen cylinder 12 for unison rotation relative to the stationarily held rock sleeve 8 and the eccentric cam 23 carried thereby, by the action of the usual line spacing mechanism of the writing machine. As the platen cylinder 12 and interconnected pin wheel unit rotate about the rock sleeve 8 and the actuating cam 23 carried thereby the feeding pins are caused to travel through an eccentric circumferential path whereby in unison with their motion about the axis of rotation they are given simultaneously a reciprocatory motion during part of such travel by which they are projected beyond the periphery of the pin wheel unit and platen cylinder as they approach the high side of the eccentric cam 23. As the pins travel beyond such high side of the eccentric cam they are automatically retracted thereby stripping or disengaging them from the marginally punched writing material with which they engage when within the pin wheel unit. Thus not only feeding the paper without strain or mutilation but also enabling the pins to clear contiguous portions of the writing machine with which they would interfere in their extended relation.

By rocking the sleeve 8 and with it the pin control cam 23 the pins are caused to project beyond the periphery of the platen roll at a considerable circumferential position. This enables the feeding pins 5 to be projected into position to operatively engage with the marginally punched writing material to progressively feed such material positively as the platen roll revolves, or the pins may be caused to project beyond the periphery of the platen cylinder in ineffective oroperative position wherein they do not engage the writing material.
The particular pin wheel unit and mode of operation hereinafter described is that disclosed in the aforementioned Letters Patents of the United States 2,009,549 and 2,009,651 and is here studied as illustrative purpose but without intent to unduly limit the application or scope of the present invention to the use of such specific pin feeding devices. It will be understood that other forms of travelling pin type feeding devices may be employed in lieu thereof. For selectively feeding the record material positively or frictionally, independently of the aforementioned pin type feeding with the usual pressure rollers 27 customarily found in conventional writing and computing machines are utilized with the present platen roll for frictionally feeding the writing material in an ordinarily rocking manner by the top and fro rocking adjustment of the sleeves 8 and with the pin control cam 23 the present platen roll may be readily and quickly adapted for either positively feeding the writing material by progressive engagement therewith of the feeding pins 5, or such writing material may be frictionally or positively fed by the cooperation of the usual pressure rolls 27 with the surface of the platen cylinder 12 in which case the feeding pins 5 are projected in an ineffective position.

For purpose of adjusting the rock sleeve 8 and carrying 23 in action, although it is normally stationarily held in one position or the other of their adjusted positions, the sleeve 8 is provided beyond the extremity of the platen roll 12 with a peripherally notched disc 28 secured thereto which may be grasped to turn the sleeve 8 from one position to the other and within one or the other of the peripheral notches of the sleeve 8 a detent 29 engages. This detent in the present instance is illustrated as a spring pressed plunger carried upon a laterally projecting ear 30 extending from a disc 31 fixedly secured by set screws to a second stationary disc 33 having a bifurcated arm 34 straddling a convenient frame rod 36 of the writing machine. By disengaging the spring pressed detent plunger from the notch of the disc 28 the latter may be rotated to adjust the cam 23 from one position to the other to project the pins in effective or ineffective relation with the writing material, in either of which positions the cam is held by the reengagement of the detent 29 with the disc 28.

The pressure rollers 27 for frictionally advancing the recording material alternately with its advancement by the feeding pins 5 are likewise adjustable into and out of operative relation with the platen cylinder by means of the usual finger lever 37a mounted upon the platen carriage of the writing machine and connected with their extended positions. This construction is typical of writing machines now in use. It enables the pressure roller 27 to be employed for feeding the record material frictionally or positively, alternately with the advancement of the material positively by the radially projecting feeding pins 5.

Mounted in parallel relation with the platen roll 12 is countershaft 42 carrying at one end thereof a gear wheel 43 intermeshing with the idler pinion 44 which in turn meshes with a gear wheel 45 connected to the platen shaft 1 and rotating in unison with the platen roll 12. The countershaft 42 is thus rotated in unison with the platen roll 12. Mounted upon the countershaft 42 is a second pin wheel unit 46 slidingly adjustable upon the countershaft 42 into registry with the marginally punched writing material of various widths, the feeding holes in the opposite margin of which register with and are engaged by the feeding pins of the pin wheel unit 2. The adjustable pin wheel unit 46 is applied upon the countershaft 42 in illustrative purpose but for independents axial adjustment thereof it may be held in various positions of axial adjust-
ment to agree with the width of the writing material to be fed by means of a collar 47 splined upon the shaft 42 and having a set screw 48 or other suitable detent means for securing it in its adjusting position. A slotted paper guide 49 is carried by the collar 47 and overhangs the marginally punched material engaged by the feeding pins of the pin wheel unit 46 which project through the holes in the material and thence through the slot in the guide 48 which loosely retains the paper in feeding engagement with the pins and prevents its accidental displacement therefrom. The construction and operation of the pin wheel unit 46 is substantially identical with that of the pin wheel unit 2 herefore described. By rocking the pin control cam to ineffective position the position of projections of the feeding pins 5 is changed from paper engaging relation into an ineffective position thereby enabling the material to be frictionally fed by cooperation of the pressure rollers in the manner before described without dependence of the pin type feeding devices. In such event if desired or found necessary the adjustable pin wheel unit 46, may be slidly adjusted upon the countershaft 42 beyond the margin of the paper being fed and hence out of engaging relation therewith. For effecting the adjustment of the feeding pin 5 of the pin wheel unit 46 into and out of effective relation with the writing material there is provided upon the countershaft 42 a telescopic tubular extension 50 axially adjustable relative to the countershaft 42 which freely rotates within such tubular extension 50. Mounted upon the tubular extension 50 within the pin wheel unit 46 is a pin control cam similar to the cam 23 before described which by the rocking adjustment of the tubular extension 50 is turned from effective to ineffective position and vice versa to change the position of projection of the pins 5 of the adjustable pin wheel unit 46. The pin wheel unit 46 however is connected to and rotates with the countershaft 42 relative to and intermediate the telescopic extension 50 and the control cam carried thereby within the unit. The tubular extension 50 is however axially adjustable with the pin wheel unit 46 to accommodate writing material of different widths. Splined upon the extension 50 is a gear wheel 51 intermeshed with a gear wheel 52 upon the supporting bracket 53 which in turn intermeshes with a gear wheel 54 mounted upon the sleeve 8 of the platen roll 12 which controls the position of projection of the feeding pins 5 of the pin wheel unit 2. The rock sleeve 8 is adjustable to alternate position by means of the disc 28 secured thereto and held in its adjusted position by the detent plunger 29. Any rocking motion of the sleeve 8 to adjust the feed pins of the pin wheel units 2 is transmitted through the several gears 54, 52 and 51 to the telescopic tubular extension 50 which is correspondingly rocked to adjust the pin control cam within the pin wheel unit 46 and thereby change the position of projection of the pins 5 thereof from effective to ineffective position and vice versa in unison with such adjustment of the feeding pins 5 of the pin wheel unit 2. Thus although the respective pin wheel units are not concentrically mounted, they are nevertheless adjustable axially into differently spaced relation to accommodate writing material of different widths and likewise the feeding pins of the respective pin wheel units are simultaneously controlled by the adjustment of the pin shifter disc 28 to change their positions of projection from effective to ineffective relation with the writing material and vice versa thus enabling the material to be frictionally fed by the action of the pressure roller 27 and the platen 12 when the pins are ineffective. When it is desired to employ the friction rolls 27 cooperatively with the platen roll 12 for advancing the writing material independently of the pin type feeding devices, they are brought into operative relation by adjustment of the finger control lever 34a, in which case either marginally punched material or material devoid of marginal feed holes may be advanced past the writing position wholly independently of the pin type feeding devices. The pin type feeding unit 46 is located above the platen roll 12 and sufficiently offset rearwardly beyond the normal path of travel of the writing material when being frictionally fed by the rollers 27 to avoid interference therewith. It is therefore not necessary nor essential that the rock sleeves and pin control cams be adjusted to cause the feeding pins to be projected in abnormal positions during such feeding.

Unpunched record material, or that having feed holes in one margin only may be fed about the platen roll and past the writing position by the friction rollers 27 in laterally offset relation with the pin wheel unit 5, in which case it is unnecessary to change the position at which the pins 8 are projected.

While two pin type feeding units are shown, to wit, the pin wheels 2 and 46, either of such pin type feeding devices may, if desired, be omitted or not used and the material may be advanced solely by engagement of either of such devices to the exclusion of the other. The provision of two such devices usable independently or conjointly enables the apparatus to be readily adapted to various conditions of use. Likewise to meet different operating requirements, the frictional feeding means and the pin type feeding means may be used intermittently and alternately to advance the same length of record material past the writing position, a part of the travel range by one device and the remainder by the other device, or each may be used wholly to the exclusion of the other for advancing different lengths of material relative to the writing position.

The present application is a division of copending application Serial No. 697,303, filed August 29, 1933, which matured as Patent No. 2,067,211, January 12, 1937.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute, the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise the preferred form of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described our invention, we claim:
1. In a writing machine wherein a portion of record material having therein parallel successions of spaced feeding holes is progressively advanced past a writing position, a rotary platen roll about which the material advances, a counter shaft in closely adjacent parallel position with the platen roll and operatively connected therewith for unison rotation, material feeding means including separate rotary circular groups of radially mounted feeding pins rotating in unison with said shaft in relatively spaced planes of rotation and engaged in spaced rows of fed holes to advance the material past a writing position, said groups of feeding pins and platen roll being positioned in like relation to the path of travel of the material for engagement from the same face thereof, and a rotary disc operable in a plane of rotation intermediate the planes of rotation of the feeding pins, to medially support the material while being advanced by the pins, said groups of feeding pins and supporting disc being axially adjustable one relative to another to accommodate material having differently located feeding holes.

2. In a writing machine wherein a continuous strip of marginally punched record material is to be progressively advanced past a writing position, a rotary platen roll about which the material is advanced, a rotary countershaft in parallel offset relation with the platen roll, a gear train for transmitting rotary motion from the platen roll to said countershaft, material feeding means including two relatively spaced rotary groups of radially disposed feeding pins progressively engageable in the marginal punchings of the record material from the same side thereof previously engaging the platen roll, at least one of said groups of feeding pins being mounted upon said rotary countershaft rotating in a path substantially perpendicular to the platen roll and axially adjustable relative to the platen roll to vary the spaced relation of said rotary groups of feeding pins, and a material supporting disc mounted upon said shaft for unison rotation in a plane intermediate the planes of rotation of said groups of feeding pins.

3. In a writing machine wherein a portion of record material having a succession of spaced feeding holes therein is progressively advanced past a writing position, a platen, universally adjustable with marginally punched record material of different widths, a rotary shaft arranged in parallel offset relation with the platen, means for rotating the shaft by rotation of the platen, a plurality of rotary groups of radially mounted feeding pins operable in relative spaced planes of rotation in unison with rotation of said shaft, and axially adjustable one relative to the other and relative to the platen, said pins being progressively engageable in the spaced feeding holes of the record material from the underside thereof to advance the material past the writing position, an axially adjustable rotary disc operable in a plane of rotation intermediate those of the spaced groups of feeding pins for supporting the material intermediate its points of engagement with the feeding pins and intermediate disc being adapted by their adjustment independently of and relative to the platen roll to accommodate the apparatus to material having feeding holes in differently spaced relation.

4. In a writing machine wherein marginally punched record material is progressively advanced past a writing position, by optionally selective dual feeding means by which the record material may be advanced either positively or impositively at the election of the operator characterized by a rotary platen roll about which the material is advanced, a counter shaft in offset parallel offset relation with the platen roll, a single pin type feeding device located in spaced relation beyond the platen roll in the direction in which the material is advanced, including a series of travelling pins progressively engageable with a series of holes in one margin only of the record material, said device being mounted in the stationary position, and a gear train transmitting motion from the platen roll to the counter shaft, and a slotted member overlying the pin type feeding device and laterally adjustable in unison therewith through the slot of which the feeding pins project beyond their engagement in the record material.

5. In a manifolding apparatus wherein an assembly of series-connected form stationery is progressively advanced past a writing position, by optionally selective dual feeding means by which the record material may be advanced either positively or impositively at the election of the operator characterized by a pin type feeding device located in spaced relation beyond the writing position in the direction of feeding movement of the stationery and a second pin type feeding device mounted for operation substantially coincident with the writing point, each including a plurality of travelling feeding pins engageable simultaneously in punched feeding holes in one margin only of the superposed continuous strips of series-connected form stationery for simultaneously advancing all of the strips of the assembly in unison past the writing position, and means for actuating the said pin type feeding devices in unison to effect progressive engagement of the pins with and disengagement thereof from the stationery and to advance the stationery while the pins are in engagement therewith, and retaining means for overlying the portion of stationery in engagement with the pins to prevent dislodgement therefrom.

6. In a writing machine wherein a strip of marginally punched record material is progressively advanced past a writing position, a platen roll about which the material is advanced, frictional feeding means for cooperatively engaging with a pin type feeding device comprising a single series of travelling pins located above the level of and rearwardly offset relative to the platen roll beyond the normal path of advancement of the material by the frictional rollers engageable in marginally punched holes in one margin only of the record material after the engaged portion thereof has been advanced past the platen roll to continue the advancement thereof independently of the frictional feeding means, and means for actuating the pin type feeding device in synchronism with the rotation of the platen.

7. A writing machine wherein a strip of record material is progressively advanced past a writing position including a platen roll about which the record material is advanced, frictional feeding means cooperative therewith, a pin type feeding device located in elevated rearwardly offset relation with the platen roll out of the normal path of advancement of the material by said frictional feeding means and engageable in spaced feed holes in the record material when deflected.
into a path of travel contiguous thereto comprising a travelling succession of spaced feeding pins operable throughout a circuitous path of travel, and a record material in a path substantially coincident with a portion of the travel of the feeding pins having therein a slot aligned with the path of travel, through which the feeding pins are projected substantially coincident with their engagement in the feed holes, and means for transmitting travel motion to the feeding pins simultaneously with the rotation of the platen.  

8. The combination with a writing machine wherein a strip of record material is progressively advanced past a writing position, of a platen roll about which the record material is advanced, by optionally selective dual feeding means by which the record material may be advanced either positively or negatively at the election of the operator characterized by a pin type feeding means located in elevated relation above the level of and rearwardly offset relative to the platen roll, the pins of which are engageable in relatively spaced feed holes in the record material to advance the material past the writing position, and a guide member disposed in parallel relation with the path of travel of the feeding pins of the travelling pin type feeding device having therein an elongated slot within which the pins of said feeding means travel while in engagement with the record material, and means for actuating the travelling pins in unison with rotation of the platen.

9. In a writing machine wherein a continuous strip of record material is progressively advanced past a writing position, a platen roll about which the material is passed, frictional feeding means cooperative therewith to advance the record material past the writing position, means for rendering the frictional means ineffective, a travelling pin type feeding means located in elevated rearwardly offset relation beyond the platen roll out of the normal path of advancement of the material by the frictional feeding means engageable in spaced holes in the record material to advance the material past writing position in lieu of its advancement by the frictional feeding means, and record material guiding means disposed in a generally upwardly and rearwardly inclined position substantially in parallel relation with a portion of the path of travel of the feeding pins for maintaining the material in feeding relation with the travelling pins during its advancement thereby and means for actuating the travelling feeding pins.

10. In an imprinting apparatus for recording indicia at longitudinally spaced intervals upon a continuous strip of record material having thereon a succession of longitudinally spaced holes and intermittently advanced past an imprinting position by a travelling series of feeding pins located in spaced relation beyond the imprinting position having progressive engagement in the longitudinally spaced holes in the strip, and laterally adjustable relative to the path of travel of the strip into different feeding positions, the combination with such strip of a slotted guide member therefor associated with the feeding pins and overlying the strip during its engagement by said feeding pins, said guide member being mounted for lateral adjustment to and fro in unison with the adjustment of the feeding pins into different feeding positions, the ends of the slotted guide member being upturned to facilitate the entrance and exit of the pins into and out of the slot thereof while in engagement in the holes in the strip.

11. In an imprinting apparatus for recording indicia at longitudinally spaced intervals upon a continuous strip of record material having in one margin thereof a succession of longitudinally spaced holes and intermittently advanced past an imprinting position by a single travelling series of feeding pins located in spaced relation beyond the imprinting position having progressive engagement in the longitudinally spaced holes in one margin only of the strip, and laterally adjustable relative to the path of travel of the strip into different feeding positions, and a slotted guide member associated with the feeding pins and overlying the strip during its engagement by said feeding pins, said guide member being mounted for lateral adjustment to and fro in unison with the adjustment of the feeding pins into different feeding positions, the ends of the slotted guide member being upturned to facilitate the entrance and exit of the pins into and out of the slot thereof while in engagement in the holes in the strip.

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