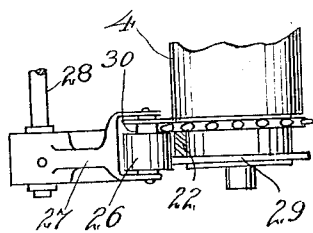
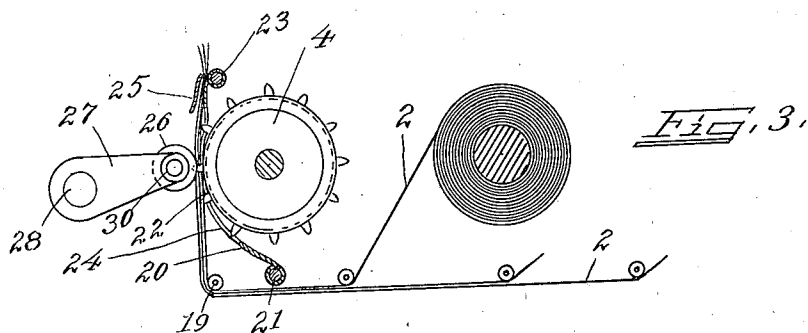
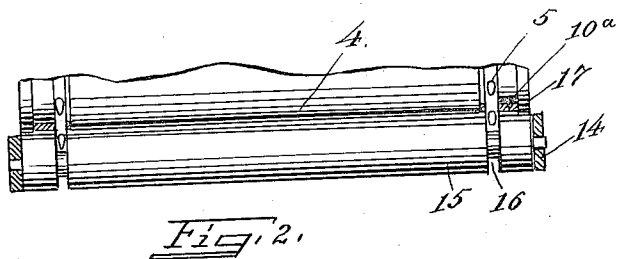
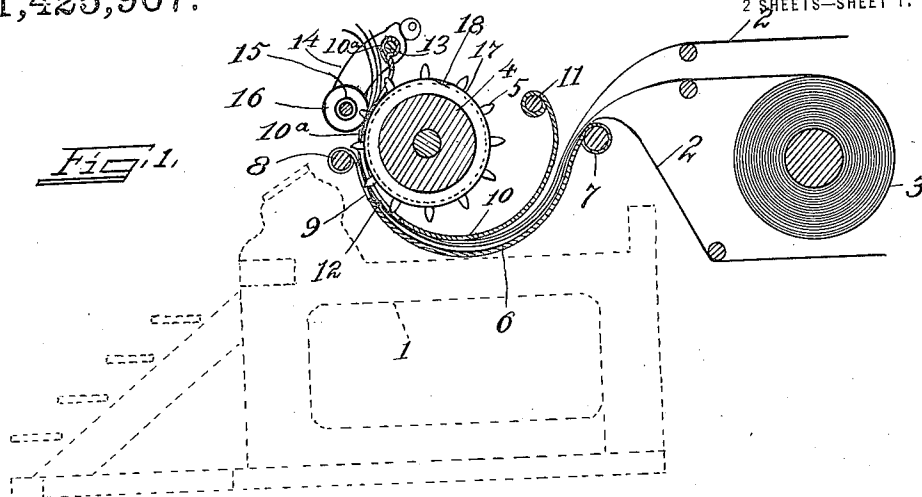


J. Q. SHERMAN.  
MANIFOLDING TYPEWRITER.  
APPLICATION FILED NOV. 26, 1919.

Patented Aug. 15, 1922.

2 SHEETS—SHEET 1.

1,425,907.



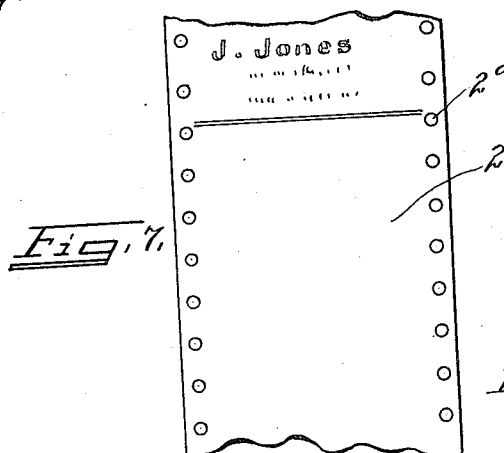
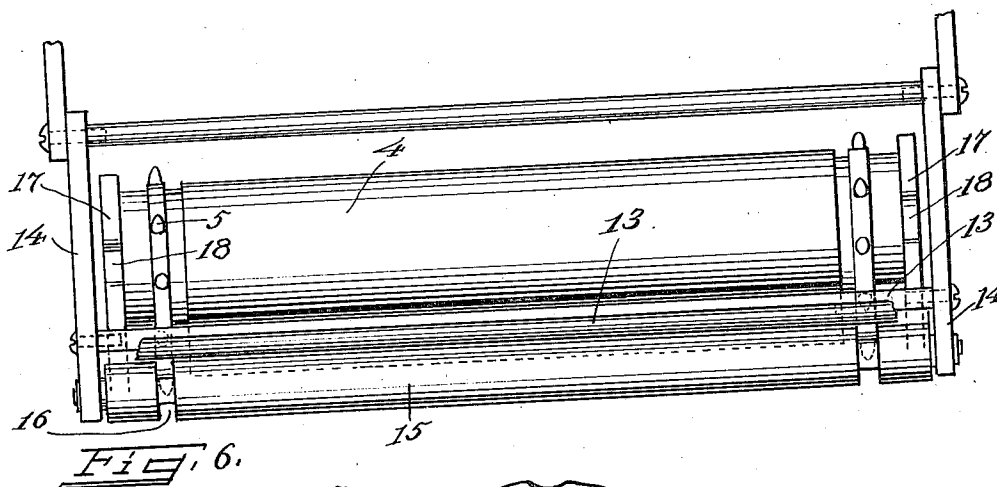
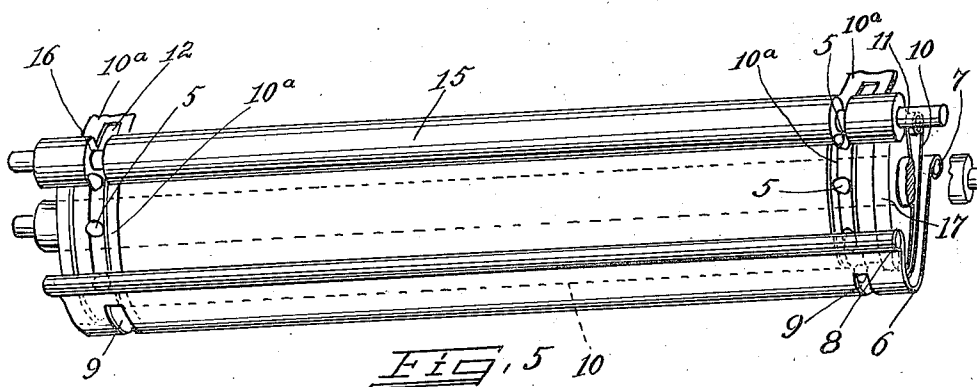
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# UNITED STATES PATENT OFFICE.

JOHN Q. SHERMAN, OF DAYTON, OHIO.

## MANIFOLDING TYPEWRITER.

1,425,907.

Specification of Letters Patent. Patented Aug. 15, 1922.

Application filed November 26, 1919. Serial No. 340,922.

*To all whom it may concern:*

Be it known that I, JOHN Q. SHERMAN, a citizen of the United States, and a resident of the city of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Manifolded Typewriters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to manifolded typewriters, particularly where designed to employ sheets of paper having successive holes punched therein, so that an aligned feed of the paper can be accomplished.

In patent granted jointly to myself and A. E. Euchenhofer, No. 1,254,368 dated January 22, 1918, is described an attachment for typewriters, which together with the typewriter makes up a manifolded machine, wherein among other things there are shown and described a pair of pin bearing wheels, which engage marginal holes in duplicated strips of paper. The said wheels are located at the opposite side of the printing platen of the typewriter proper, from the paper mounting means, and in this way I am enabled to feed the strips of paper in alignment, all as fully set forth in said patent, to which reference is hereby made.

I am aware that it has been attempted in the past to feed duplicate sheets of paper over a platen by means of toothed bodies mounted on the platen itself, but the difficulty with such a means of feeding paper, is that it cannot feed a number of strips in alignment. One reason for this is that, in passing around a revolving platen, which feeds the paper during its revolution, the outside sheets of paper must take a path of travel on a slightly larger radius than the inside sheets. This results, after a number of feet of paper have passed around the platen, in a mis-alignment of the strips, which cannot be compensated for, in any typewriting machine with which I am familiar.

It is the object of this invention to provide a pin wheel feed for paper which is mounted on the same center as the platen, but which at the same time can allow for the difficulties of feeding in perfect registration, that has hitherto been impossible, so far as I am advised, in such a form of mechanism.

Among other features, by which I am enabled to accomplish this, is the provision of means for preventing the paper from following around the surface of the platen, and which enforces a more or less tangential path to the paper past the printing line and which holds it more or less loosely, as a result of which a pair of pin bearing wheels mounted on the ends of the platen will be enabled to feed the paper in alignment, as I will fully develop hereinafter.

The above object and other advantages to be noted I accomplish by that certain construction and arrangement of parts to be hereinafter more specifically pointed out and claimed.

In the drawings,

Figure 1 is a side elevation, somewhat diagrammatic of a typewriter showing my method of feeding the duplicate strips of paper in alignment.

Figure 2 is a detail front elevation showing the special roller which is provided with my new form of feed for holding the paper down on the pins.

Figure 3 is a view in diagrammatic form, of a modified method of attaining the tangential feed heretofore referred to.

Figure 4 is a detail plan view of a modified form of roller, which is employed with the parts shown in Figure 3.

Figure 5 is a detail front elevation showing the platen pin wheel and guide of my first modification.

Figure 6 is a detail top plan view of the same parts.

Figure 7 is a plan view of a form of paper which can be employed with my machine.

1 indicates the casing of a typewriter, which may be of any familiar type, and which will have paper mounting means, for strips of paper 2, and either a carbon paper roll or rolls, such as the roll 3 or else some accepted form of duplicate ribbon (not shown). No special form of carriage is shown for the typewriter, since this forms no special feature of my invention, but it will be understood that the paper will move with the carriage, as is customary in manifolded attachments.

I do not, however, wish to be limited in this invention to any details of typewriter construction apart from my novel paper feeding device, which might form the part of any typewriter with simple mechanical

modifications that would be apparent to the mechanic, once the principle is explained.

The platen 4, (Figure 1) has mounted on its ends, or if found desirable on one end only, a toothed feeding means comprising preferably sprocket teeth 5 spaced apart the desired distance and shaped for paper feeding.

In order to provide against the paper from passing around the periphery of the platen in a circular path, so that the teeth engage the paper at a time when it is held partially wrapped around the platen, I provide a guiding means which brings the paper loosely to the pins, and keeps it off of the platen.

This guide comprises one curved member 6 mounted over a cross rod 7 of the carriage, and thence running down around beneath the platen, terminating at another cross rod 8 of the carriage in front of the platen. This guide is slotted at 9 to permit clearance for the teeth on the ends of the platen.

To complete the guide I provide another curved member 10, mounted over a rod 11 of the carriage, and thence running down between the outer guide piece and the platen, to form a curved passageway through which the strips of paper may loosely pass. This inner plate is slotted at 12, at each side, to permit the teeth of the feeding elements to pass through it, and is continued upwardly to the printing face of the platen, and thence continues by means of arms, 10<sup>a</sup>, to a cross rod 13 of the carriage so as to leave the printing exposed and still leave a slotted bar over the toothed elements to act as a stripper in removing the paper from the pins.

Mounted on the cross rod 13, and spring-pressed or weighted downwardly are arms 14, carrying a roller 15. This roller is slotted to provide clearance for the pins as at 16 (Figure 2) and rides on disks 17, mounted over the ends of the printing platen, so as to be elevated out of contact with the platen during the feed of the paper, but permitted to assume a position close enough over the pins to hold the paper thereon. If desired, the disks can be provided with notches 18 to let the roller down tight against the platen, at the close of each complete rotation of the platen.

The amount of curve of the guide for the strips of paper can be regulated within certain limits so as to allow for the desired amount of engagement of the pins with the paper. The limits must be abided by, however, since too much of a curve will put the paper out of control of the pins.

In operation of this feeding device, the paper strips formed with marginal holes, positioned alike for all strips, are brought down through the trough-like guide, and thence around and up past the platen, where

they are placed with the corresponding holes in line with each other and set over the pins. The machine is then operated in the usual manner which results in a feeding of the paper upwardly past the printing point on the platen, same being in the type of machine selected approximately on the horizontal plane of the axis of the platen. During this feed the paper strips are held substantially loosely against the pins by means of the roller 15, and stripped from the pins by means of the arms 10<sup>a</sup>.

The amount of bend or curve, to increase or decrease the number of pins which will at the same time have engagement with the strips of paper, is regulated by the guiding elements, and can vary anywhere from a perfectly straight line to a line which results in a binding of the strips such that free feeding cannot be accomplished.

By free feeding I refer to the ability of the paper strips to mutually adjust themselves upon the pins. In the construction of the pins I, preferably, provide a pin tapering to a blunt point which has a diameter at its base that is appreciably smaller than the diameter of the holes in the paper strips. It will be noted that the paper strips 2, for use with the preferred form of the invention, have accurately spaced, successive, marginal holes 2<sup>a</sup>, these holes being along both margins where two pin wheels are used and, of course, spaced to correspond to the spacing of the pins.

In the printing of strips of paper into forms, it is possible to get a very accurate positioning of a series of marginal holes with relation to the printed material on the forms but it is not so readily possible to obtain an absolute equality in the length of said forms due to the tendency of paper to stretch. One of the necessary items in order to insure the engagement by any one pin with the corresponding holes in a number of superimposed forms is the proportion of the diameter of the pins to the diameter of the holes, which has been noted above. Another necessary feature is that the several superimposed pieces of paper must be free to adjust themselves on the pins while being fed thereby.

In fact, when the ordinary paper, such as is used for this purpose, is under more or less rigid tension while being fed, it will tear out at the holes if there happens to be an inaccuracy.

My guiding means provides for this loose retaining of the paper both from its special conformation, and from the point of view of its preventing the paper from wrapping partly around the rotating platen and thus binding thereon.

I accomplish a like function of preventing duplicate strips of marginally punched paper from binding on a platen by omitting

a curved guide, and leading the various strips down and under a platen, in such a way that they pass the platen substantially tangentially. My outer guide plate is not requisite in such an arrangement, which is shown in Figures 3 and 4.

The strips of paper 2 in this modification are led from the paper mounting means over an idler roller 19, lying substantially directly in the plane of the printing line on the platen. A guide plate 20 is mounted on a cross rod 21 of the carriage, and extends upwardly in spaced arms 22 past the printing face of the platen to a cross bar 23 of the carriage. The arms are slotted at 24 to clear the pins.

In the instance of this plate 20 and the analogous plate 10 in the first modification, I may form a tearing edge by an integral or separate plate 25, mounted on the cross rod 23, and spaced apart from the rod, about enough distance to permit the required number of strips of paper to pass through the slot so formed, or any other accepted form of tearing blade could be provided.

I have also shown a modified form of roller to keep the paper on the pins, without excessive friction. This roller device comprises two small rollers 26, each mounted by means of arms 27 to a cross rod 28. They are suitably spring-pressed or weighted against cams or disks 29 on the platen of the machine, to prevent excessive pressure on the paper, and are slotted at 30 to clear the pins.

Instead of either of the above described forms of device for preventing the paper from falling away from the pins, I might provide a mere grooved bar, although this would not be as much of an antifriction means as a roller, and thus would be by so much, a less effective device.

Should it be desired to have the platen stationary and the pin wheels only, movable, my device would be effective for a proper aligning feed, although the rotary platen is desirable in a typewriting machine for other reasons than feeding the paper. The essential of my invention may be stated in one way as the provision of a toothed feeding means for paper which maintains its engagement with the paper along the line being printed upon.

It is also adapted particularly for use with a rotary platen form of typewriter machine, thereby permitting a self-aligning feed sprocket wheel or pin wheel being mounted or formed on a normal platen.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a typewriting machine, the combination with a platen, of a toothed rotary feeding element mounted on an axis on sub-

stantially the horizontal plane of the printing point of the platen for engaging successive holes in a plurality of strips of paper and means for guiding said paper past the printing point, said means being adapted to retain the paper substantially loosely while in feeding engagement with the toothed element.

2. In a manifolding machine, the combination with a rotary platen of toothed feeding means operating on substantially the same axis as the platen, for engaging successive holes in a plurality of strips of paper, and means for guiding the paper past the printing point of the platen in a path substantially tangential to said platen and in contact with the toothed means and out of binding contact with each other.

3. In a manifolding machine the combination with a rotary platen, of toothed members mounted at the ends of the platen and operating therewith, to engage in successive holes in a plurality of strips of paper, and means for guiding the paper strips in loose relative condition past the printing point of the platen in contact with the toothed means and substantially tangentially to the platen.

4. In a manifolding machine the combination with a rotary platen, of toothed members mounted at the ends of the platen and operating therewith, to engage in successive holes in a plurality of strips of paper, and means for guiding the paper strips in loose relative condition past the printing point of the platen in contact with the toothed means and out of binding contact with the platen, comprising, at least, in part a slotted member lying over the toothed elements and means for retaining the paper away from substantial contact with the platen except at the printing point.

5. In a manifolding machine, the combination with a platen and toothed means adapted to engage and retain a plurality of strips of paper at the printing point on said platen, of a guide for the paper passing around the platen and adapted to permit access of the toothed means to the paper, said guide being adapted to retain the paper loosely therein.

6. In a manifolding machine, the combination with a rotary platen of toothed feeding means thereon for engaging and feeding a plurality of strips of paper having successive holes punched therein and means for retaining the paper loosely on the toothed means, and out of frictional feeding engagement with the platen.

7. In a manifolding machine, the combination with a rotary platen, of feeding pins mounted at the ends of the platen and adapted to engage successive holes in a plurality of strips of paper, and a paper guide adapted to lead the paper to the printing

point on the platen, in loose engagement with said pins and out of frictional feeding engagement with the platen.

8. In a manifolding machine, the combination with a rotary platen, of feeding pins mounted at the ends of the platen and adapted to engage successive holes in a plurality of strips of paper, and a paper guide adapted to lead the paper to the printing point on the platen, in loose engagement with said pins and in loose relative condition and out of contact with the periphery of the platen except a substantial tangential contact.

9. In a manifolding machine, the combination with a rotary platen, of toothed means at the end or ends of the platen for engaging successive holes in paper to be written upon, and means for retaining the paper in substantially loose feeding contact with the toothed means and out of frictional feeding contact with the platen.

10. In a manifolding machine, the combination with a rotary platen, of toothed means on the platen for engaging successive holes in paper to be written upon, and means for retaining the paper in substantially loose feeding contact with the toothed means and out of feeding contact with the platen, said means comprising, at least in part, a pair of interspaced plates to guide the paper to the printing point of the platen and stripping means to lift the paper from toothed means.

11. In a manifolding machine, the combination with a rotary platen, of toothed means at the end or ends of the platen for engaging successive holes punched in paper to be written upon, and means for retaining the paper in substantially loose feeding contact with the toothed means and out of feeding contact with the platen, said means comprising at least in part a pair of interspaced plates to guide the paper to the printing point of the platen and stripping means to lift the paper from the toothed means, and an element to keep the paper down on the pins without excessive friction until stripped.

12. In a manifolding machine, the combination with a rotary platen, of toothed means at the ends of the platen for engaging successive holes stamped in paper to be written upon, and means for retaining the paper in substantially loose feeding contact with the toothed means and out of feeding

contact with the platen, said means comprising at least in part a stripping means lying over the toothed means, and a member outside of the feeding means and adapted to hold the paper down on the pins without friction.

13. In a manifolding machine, the combination with a rotary platen, of means for feeding a plurality of strips of paper past the printing point on said platen, said means comprising in part elements for preventing the paper from engaging any substantial portion of the face of the platen except at the printing point and imparting a substantially tangential path thereto at said point.

14. In a manifolding machine, the combination with a rotary platen, of toothed means at the end or ends of the platen for engaging successive holes in paper to be written upon, and means for retaining the paper in substantially loose feeding contact with the toothed means and out of feeding contact with the platen, and imparting a substantially tangential path thereto at said point and a carriage for said platen, said means being mounted on the carriage.

15. In a manifolding machine, the combination with a rotary platen, of toothed means at the end or ends of the platen for engaging successive holes in paper to be written upon, and means for retaining the paper in substantially loose feeding contact with the toothed means and out of feeding contact with the platen, said means comprising, at least in part, a stripping means lying over the toothed means, and a member outside of the feeding means and adapted to hold the paper down on the toothed means without friction, and a carriage for said platen, said stripping means and member being mounted on the carriage.

16. In a manifolding machine, the combination with a rotary platen, of toothed means at the end or ends of the platen for engaging successive holes in paper to be written upon, and means for retaining the paper in substantially loose feeding contact with the toothed means and out of feeding contact with the platen, said toothed means comprising radial tapered pins having an engaging diameter with the holes in the paper, of substantially less size than the diameter of the holes.

JOHN Q. SHERMAN.