Sept. 12, 1939. C. C. ROSE 2,172,913

PAPER FEEDING DEVICE

Filed May 18, 1932

FIG. 1

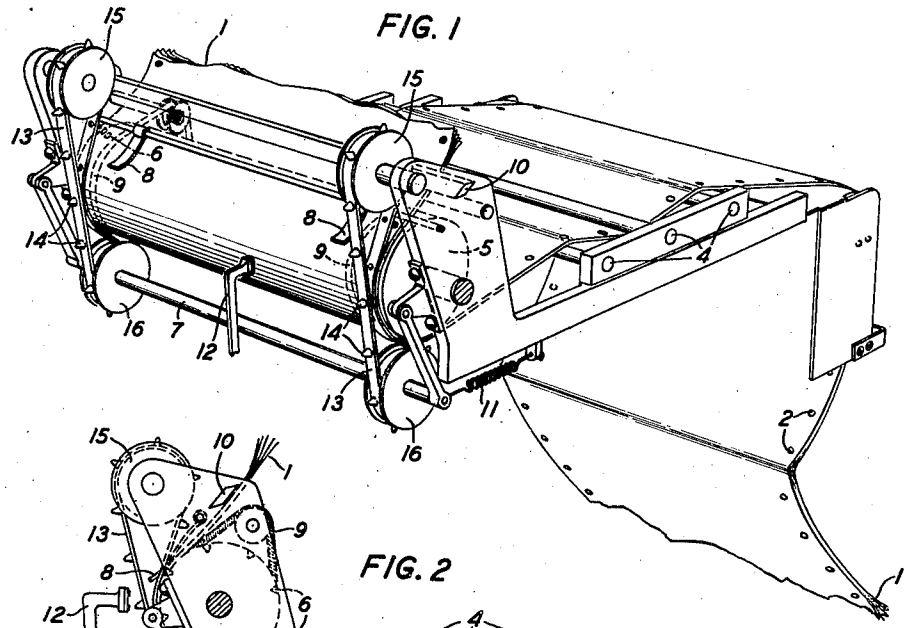
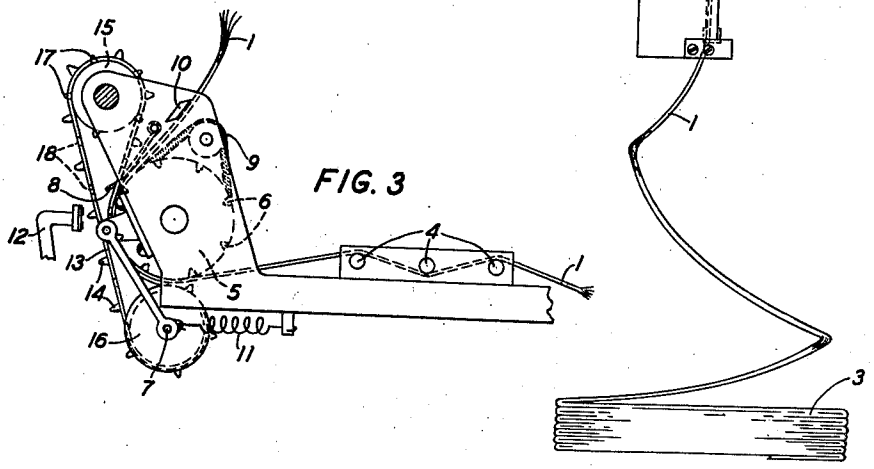


FIG. 2

FIG. 3



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PAPER-FEEDING DEVICE

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18 Claims. (Cl. 197—133)

This invention relates to devices for printing on multicopy stationery. More particularly, it relates to improvements in methods for feeding and aligning such stationery in collaboration with the printing operations of devices of this type.

When sprocket feed multicopy stationery is used in a typewriter the two chief problems, which are ordinarily encountered, relate to the controlling of misalignment and buckling of the individual sheets of stationery.

Misalignment, which may be either horizontal or longitudinal, of the individual sheets of stationery results in the accompanying misalignment of the marginal perforations in the stationery. When such misalignment occurs, instead of the perforations in one sheet coinciding with those in another sheet, each hole will be partly covered by the sheet next to it. Such obstruction of the holes results in the tearing of the stationery by the feeding pins contained in the ordinary typewriter. Due to the fact that this misalignment is cumulative, unless some correction is made, the tearing will have assumed considerable proportions by the time the end of a pack of stationery is reached. Such tearing is, of course, highly objectionable from an appearance standpoint. It is also undesirable from the viewpoint of the future use of the stationery after it has been typed. Subsequent handling is impeded and is apt to aggravate the torn condition of the sheets.

In order to secure clear carbon copies, it is necessary that the multicopy sheets be tightly compressed at the printing point of a typewriter. If the sheets of stationery are loose, the force of the blow of a type bar upon the stationery is dissipated and the resulting carbon copy will be faint, blurred, and illegible. When multicopy stationery is bent around the curved surface of a cylindrical platen, the individual sheets tend to be compressed. However, when the number of the individual sheets is increased, or when thicker paper is used, it has been found that such multicopy stationery will be apt to buckle or bend outward and away from the platen. Such buckling greatly hinders the obtaining of clear carbon copies.

An object of this invention is to provide an improved arrangement for feeding multicopy stationery through a typewriter so as to insure smooth feeding and the prevention of buckling of the sheets of stationery.

Another object of this invention is to provide an improved arrangement for aligning multicopy stationery while passing through a typewriter.

In accordance with this invention a modification is made of the cylindrical platen usually employed in typewriters. This modification resides in the use of a cylindrical platen having circumferential holes near each end.

Two endless studded, or toothed, belts, each passing around two wheels, are so located as to co-act with the platen. These toothed belts have projecting teeth, studs, or feeding pins which are round and which have conical ends. This shape enables the teeth to fit easily into the holes in the platen and also to become easily disengaged therefrom. The wheels on which the belts travel may be either idler pulley wheels or driven gear wheels. These wheels are so located that the belts are forced to follow the curved surface of the platen. In this way, more than two teeth of each belt are in contact with the platen at a given time thereby preventing misalignment of the sheets of stationery. Since the belts conform snugly to the surface of the platen, the stationery is not able to buckle.

The invention will be better understood from the following detailed description with reference to the accompanying drawing, wherein:

Figure 1 shows a three-dimensional view of a preferred form of the invention;

Fig. 2 shows a cross-sectional view of the arrangement shown in Fig. 1; and

Fig. 3 shows a cross-sectional view of an alternative arrangement of the invention.

In Fig. 1, sprocket feed multicopy stationery 1 having marginal perforations 2 is fed from a pack 3 (shown in Fig. 2) through a typewriter similar to that described in a patent application of E. F. Watson and T. A. McCann and having Serial Number 501,362. Only those elements of the typewriter are shown that are pertinent to the present invention. To insert stationery 1 into the typewriter, stationery 1 is passed from pack 3 through retarding rods 4, 4 to platen 5. It will be noted that platen 5 has circumferential holes 6, 6 near each end. In order to pass stationery 1 around platen 5 it will be found convenient to manually pull rod 7 away from platen 5. When this is done, stationery 1 may be readily grasped, pulled forward, bent around platen 5, fed under spring members 8, 8, over carrier belts 9, 9, under tearing edge 10, and thus out of the typewriter. Springs 11, 11 insure the return of rod 7 to its normal position. The printing point indicated by type bar 12 is so located that it will not interfere with the movements of rod 7.

When stationery 1 has been inserted into the

typewriter, typing may take place in the usual manner except for the method of feeding stationery 1 through the typewriter. In accordance with the invention, an endless belt 13, 13 studded with feeding pins 14, 14 is located near each end of platen 5. Each belt 13, 13 travels over two idler wheels 15, 15 and 16, 16 located near each end of the platen. It will be noted that rod 7 passes through the centers of wheels 16, 16. The studs, or feeding pins 14, 14, of each belt 13, 13 are of the proper size to facilitate easy engagement and disengagement with circumferential holes 6, 6 in platen 5. Feeding pins 14, 14 are normally forced into engagement with circumferential holes 6, 6 due to the tension of springs 11, 11.

Marginal perforations 2, 2 in stationery 1 are so spaced that, when stationery 1 is sandwiched between platen 5 and endless belts 13, 13, feeding pins 14, 14 will pass through marginal perforations 2, 2 into circumferential holes 6, 6. As in an ordinary typewriter, driving power is supplied to platen 5. When platen 5 rotates, it carries with it feeding pins 14, 14 due to their engagement with circumferential holes 6, 6. This causes endless belts 13, 13 to travel around wheels 15, 15 and 16, 16. Stationery 1 is thus fed through the typewriter by the co-action of feeding pins 14, 14 and circumferential holes 6, 6.

Wheels 15, 15 and 16, 16 are so located that belts 13, 13 are forced to follow the curved surface of platen 5. In this way, more than two of feeding pins 14, 14 of each belt are in contact with circumferential holes 6, 6 around each end of platen 5. This is an important factor in preventing misalignment of the individual sheets of stationery 1 because stationery 1 is thus more completely controlled while passing through the typewriter.

Springs 11, 11 are of the proper elasticity to cause rod 7 to be pulled as far away from type bar 12 as endless belts 13, 13 will permit. This causes belts 13, 13 to fit snugly against platen 5 thereby forcing stationery 1 to follow the curved surface of platen 5 thus preventing buckling of the sheets of stationery.

Stationery 1 may be apt to stick to endless belts 13, 13 due to a possible tight fit between marginal perforations 2, 2 and feeding pins 14, 14. If this should occur stationery 1 would be apt to be fed around wheels 15, 15 and then down to wheels 16, 16, thereby impeding the process of typing. To obviate such a difficulty it is desirable to employ spring members 8, 8 which serve to strip stationery 1 from endless belts 13, 13. Carrier belts 9, 9 cooperate with spring members 8, 8 and, by means of both, stationery 1 is fed under tearing edge 10 and then out of the typewriter.

This form of the invention is also shown in Fig. 2 which supplies a cross-sectional view of the arrangement shown in Fig. 1.

Fig. 3 shows a cross-sectional view of an alternative arrangement of the invention. Here platen 5 is an idler and wheels 15, 15 are the driving wheels. Driving power may be supplied to wheels 15, 15 in a manner similar to that in which it is ordinarily supplied to platen 5 or in any other convenient fashion. In this case, wheels 15, 15 have sprockets 17, 17 which engage with holes 18, 18 and endless belts 13, 13. Holes 18, 18 are so located as not to impair the use of feeding pins 14, 14. Since wheels 16, 16 are located on rod 7 which is movable in order to facilitate the insertion of stationery 1 into the typewriter, it is desirable that wheels 16, 16 be idler wheels. However, driving power could readily be supplied to them if desired.

It is to be understood that this disclosure should merely be considered as illustrative of the invention. Those skilled in the art may make various changes in the details and arrangements of the parts without departing from the spirit and scope of the invention. The terms of the claims appended hereto are, therefore, not to be restricted to the precise construction herein disclosed, but are intended to cover all changes and modifications employing the principles and features of operation of the invention.

What is claimed is:

1. A device for printing on sprocket feed stationery having perforations therein, characterized in this, that said device includes feeding means for feeding stationery through the device, said feeding means comprising an endless studded belt coacting with a cylindrical platen having circumferential holes therein, the studs on the belt being adapted to engage with both the holes in the platen and the perforations in the stationery.

2. In a device for printing on positively driven sprocket feed stationery having perforations therein, feeding and aligning means comprising a platen having holes therein corresponding to the perforations in the stationery, an endless belt having studs thereon to engage with both the holes in the platen and perforations in the stationery, pulleys over which the belt passes, one of the pulleys being so mounted as to be movable to and from the platen to move said belt into and out of engagement therewith.

3. In a device for printing on positively driven stationery, a platen having circumferential holes therein, an endless studded belt engaging the platen over a portion of its circumference for pressing the stationery against the platen, and means to positively move the belt at the same rate as the surface of the platen during feeding, said means including the studs on the belt and the holes in the platen.

4. The method of feeding and aligning perforated stationery during its passage through a device for printing on such stationery, said method comprising operating driving means for driving an endless studded belt along a portion of a cylindrical platen having circumferential holes therein, sticking the studs on the belt into the perforations in the stationery, sticking the studs on the belt into the holes in the platen, and sandwiching the stationery between the belt and the platen.

5. In a device for printing on stationery having perforations therein for feeding purposes, said device having a cylindrical platen having circumferential holes near each end, an improved positive drive feeding arrangement including studded endless belts located near each end of the platen, pulleys located above and below the platen for supporting the belts, the pulleys being located in such a manner that the belts are forced to follow the curved surface of the platen with the result that more than two of the studs on each belt are in contact with the circumferential holes in the platen at a given time.

6. A device for printing upon stationery having perforations therein for feeding purposes, said device having a sprocketless cylindrical platen having circumferential holes therein, said device also having an arrangement for aligning the sta-

tionery while passing through the device, said aligning arrangement including a studded endless belt passing around a portion of the curved surface of the platen, and instrumentalities for causing the belt to always have more than two of its studs in contact with both the circumferential holes in the platen and the perforations in the stationery.

7. In a device for printing on sprocket stationery having aligned perforations, feeding and aligning means comprising a cylindrical platen having circumferential holes near each end, toothed means independent of the platen, each tooth of said toothed means being adapted to engage both with the perforations in the stationery and with the circumferential holes in the platen, and an instrumentality for simultaneously moving all of said toothed means out of engagement with the holes in the platen.

8. A device for printing upon sprocket feed stationery having perforations therein, said device having feeding and aligning means for feeding and aligning the stationery, said feeding and aligning means including an idler sprocketless cylindrical platen having circumferential holes therein, a positively driven belt, and driving means for effecting the rotation of the platen, said driving means comprising a plurality of studs attached to the belt, each stud being adapted to fit into both the holes in the platen and the perforations in the stationery.

9. A device for printing on sprocket feed stationery having aligned perforations therein, feeding and aligning means comprising a sprocketless platen having holes in its surface, and two studded belts adapted to cooperate with the platen, each stud of said studded belts being adapted to engage with both a perforation in the stationery and a hole in the platen at the same time, and an instrumentality for removing said studded belts from contact with the platen.

10. The combination with a writing machine having a platen and a writing position past which record material is progressively advanced, of a pin type feeding device for positively feeding the record material past the writing position in a predetermined path of travel, said pin type feeding device being mounted for bodily movement toward and from the path of travel of the record material into and out of interengaging relation therewith.

11. The combination with a writing machine having a platen and a writing position past which record material is progressively advanced, of means for rotating the platen, a pin type feeding device for positively feeding the record material past the writing position in a predetermined path of travel, said pin type feeding device being mounted for bodily movement toward and from the path of travel of the record material into and out of interengaging relation therewith, and means for moving the pins of the pin type feeding device in accordance with the rotation of the platen.

12. The combination with a writing machine having a platen and a writing position past which record material is progressively advanced, of a pin type feeding device mounted outside the platen for positively feeding the record material past the writing position in a predetermined path of travel, guide means for defining the path of travel of the record material, means for moving the feeding pins of said pin type feeding device along a path of travel, and means for varying the path of travel of the feeding pins for discontinuing the feeding of the record material by said pin type feeding device.

13. The combination with a writing machine having a platen and a writing position past which record material is progressively advanced, of a pin type feeding device mounted outside the platen for positively feeding the record material past the writing position in a predetermined path of travel, the record material and the feeding pins of the pin type feeding device normally traveling in intersecting paths of travel, and means for varying the path of travel of one relative to the other for discontinuing the feeding of the record material by said pin type feeding device.

14. The combination with a writing machine having a platen and a writing position past which record material is progressively advanced, of a plurality of pin type feeding means, supporting means independent of the platen for supporting said pin type feeding means outside the platen and its peripheral extension in a readily accessible and convenient location for facilitating the assembling and maintenance of both the supporting means and the feeding means, said platen having a plurality of cut-out portions for accommodating the feeding pins of said pin type feeding means for enabling said feeding means to act upon the record material.

15. In a printing machine for printing upon record material having holes therein, feeding means for feeding said record material in said printer machine, said feeding means comprising in combination, a revoluble platen having circumferential holes therein, a plurality of discs, a plurality of feeding pins, and means for enabling said discs to carry said feeding pins for fitting the feeding pins into the holes in the record material that is fed between the discs and the platen, the feeding pins meshing with the holes in the platen.

16. In a printing machine for printing upon record material having holes therein, feeding means for feeding said record material in said printer machine, said feeding means comprising in combination a revoluble platen having circumferential holes therein, a plurality of discs, a plurality of feeding pins, means for enabling said discs to carry said feeding pins for fitting the feeding pins into the holes in the record material that is fed between the discs and the platen, the feeding pins meshing with the holes in the platen, and an adjustably mounted shaft extending parallel with the platen for carrying at least two of said discs for enabling the feeding pins to be carried away from said platen and out of engagement with the holes in the platen for discontinuing the feeding of the record material by the feeding means.

17. In a printing machine for printing upon record material having holes therein, feeding means for feeding said record material in said printer machine, said feeding means comprising in combination a revoluble platen having circumferential holes therein, a plurality of discs, a plurality of feeding pins, means for enabling said discs to carry said feeding pins for fitting the feeding pins into the holes in the record material that is fed between the discs and the platen, the feeding pins meshing with the holes in the platen, a shaft extending parallel with the platen for carrying at least two of said discs, and spring tension means for pulling said shaft with its discs toward the platen for pressing the feeding pins against the record material and the platen.

18. In a printing machine for printing upon

record material having holes therein, feeding means for feeding said record material in said printer machine, said feeding means comprising in combination a revoluble platen having circumferential holes therein, a plurality of discs, a plurality of feeding pins, means for enabling said discs to carry said feeding pins for fitting the feeding pins into the holes in the record material that is fed between the discs and the platen, the feeding pins meshing with the holes in the platen, and a swinging carrier for supporting said discs by the to and fro motion of which the feeding pins are shifted into and out of feeding relation with the record material.

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