

1,278,474.

W. S. IRELAND.
SHORTHAND MACHINE.
APPLICATION FILED NOV. 18, 1916.

Patented Sept. 10, 1918.
3 SHEETS—SHEET 1.

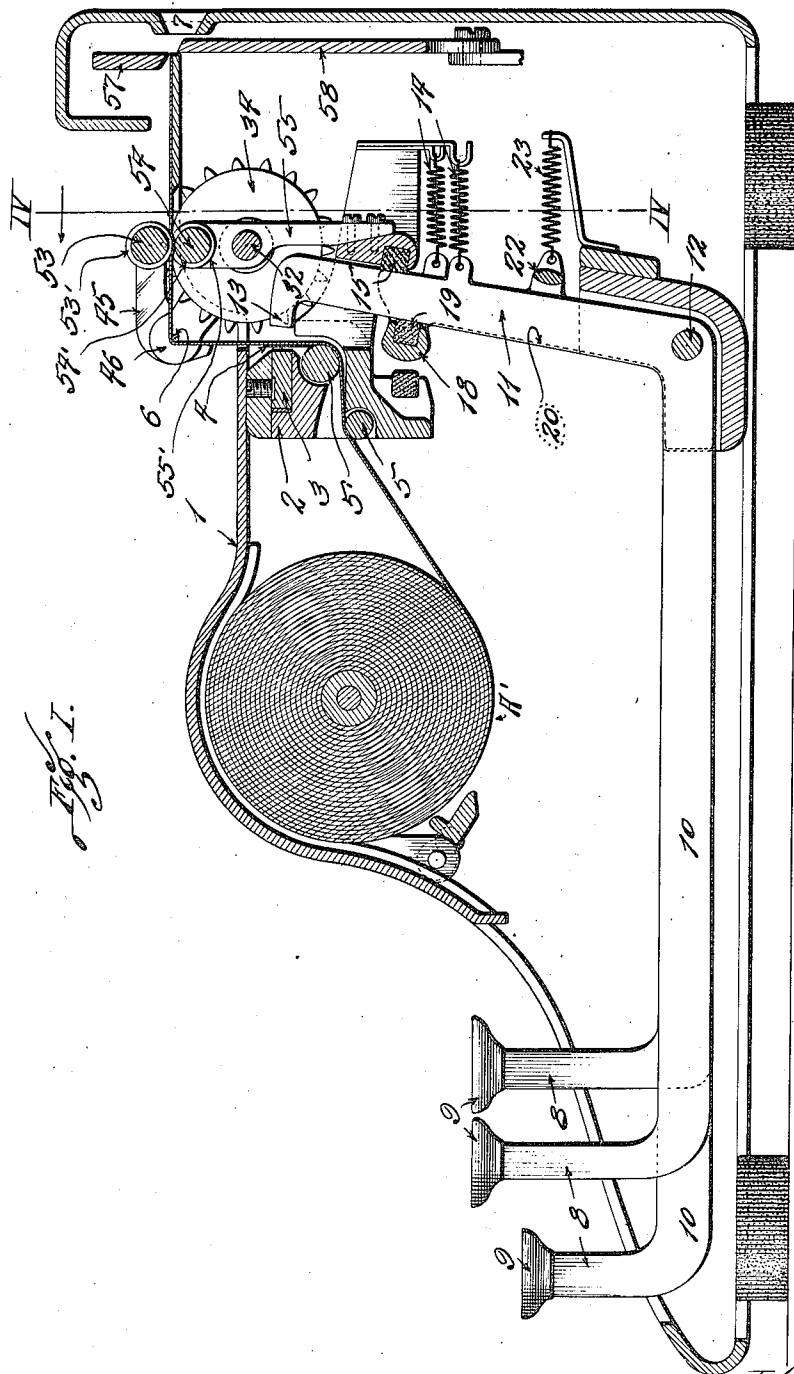


Fig. 1.

BY

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3 SHEETS—SHEET 2.

Fig. II.

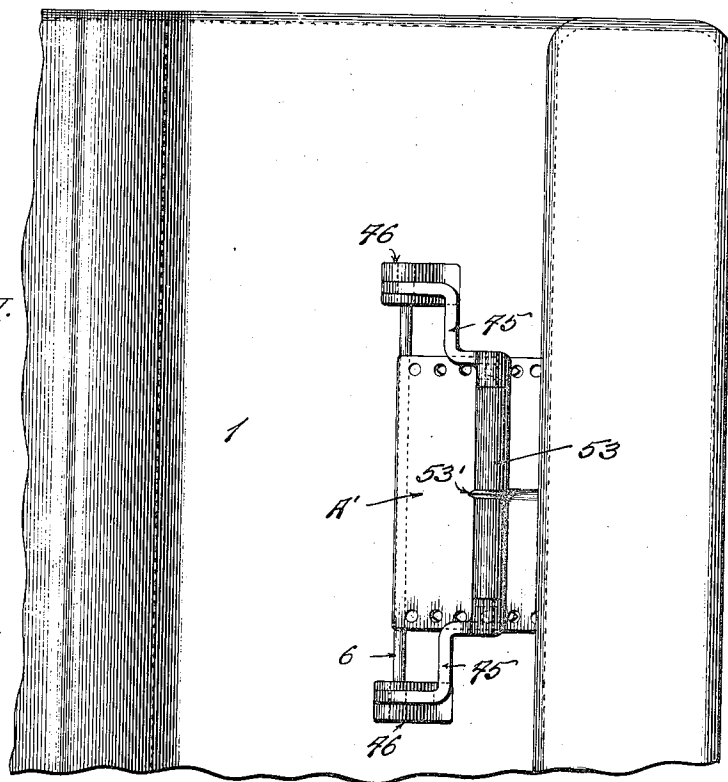
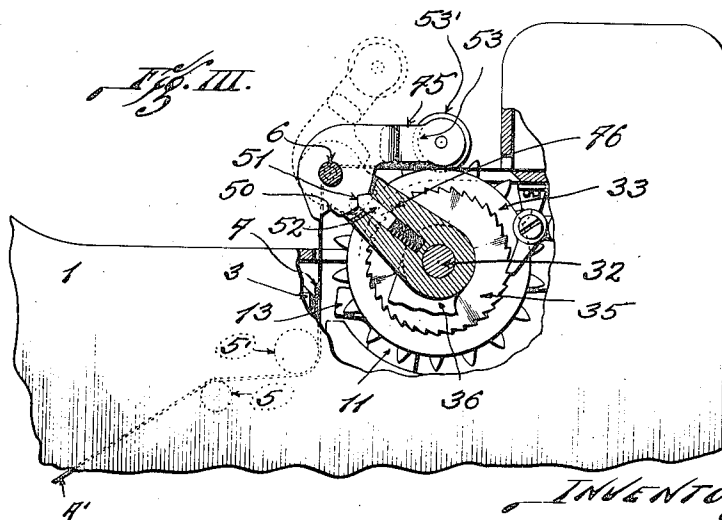


Fig. III.



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3 SHEETS—SHEET 3.

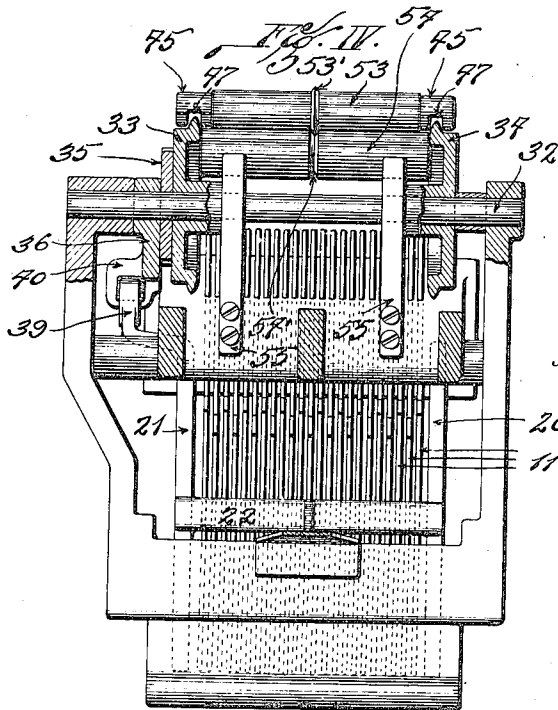
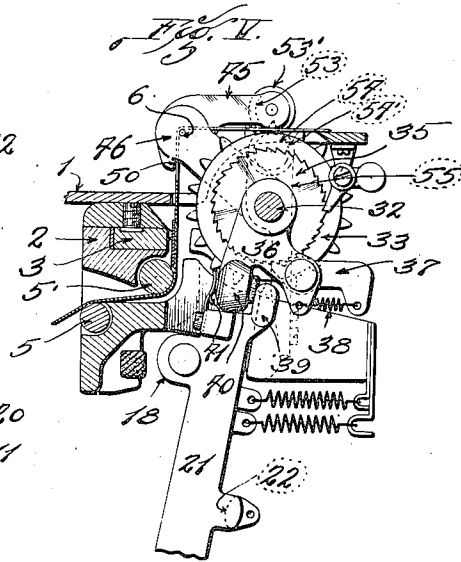
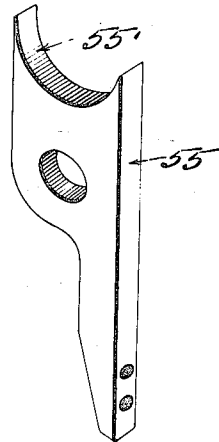
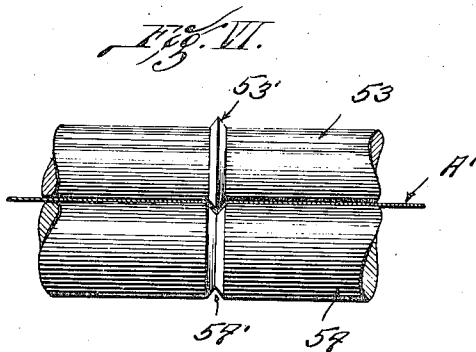


Fig. VII.



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UNITED STATES PATENT OFFICE.

WARD S. IRELAND, OF ST. LOUIS, MISSOURI, ASSIGNOR TO NATIONAL SHORTHAND MACHINE COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF DELAWARE.

SHORTHAND-MACHINE.

1,278,474.

Specification of Letters Patent. Patented Sept. 10, 1918.

Application filed November 18, 1916. Serial No. 132,070.

To all whom it may concern:

Be it known that I, WARD S. IRELAND, a citizen of the United States of America, a resident of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Shorthand-Machines, 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 improvements in typewriting machines, and the novel features of the invention are particularly adapted for use in shorthand machines. Prior to this invention, shorthand machines have been provided with means for feeding a continuous strip of paper, which unwinds from the roll and passes to printing devices, whereby a continuous series of shorthand characters are printed upon the paper. Owing to the peculiar requirements of a shorthand machine, it is a decided advantage to use a very long strip of paper so that the shorthand writing may be continued for a considerable period of time without frequent interruptions, and heretofore the paper supply has been firmly wound in a compact mass around a core or reel. Since the paper is primarily curled around the axis of a roll, it tends to return to a curly or spiral condition after passing from the machine. If torn from the machine in comparatively short strips, the paper would be in the form of small curls containing the notes to be transcribed by the stenographer, and it will be apparent that such paper is quite difficult to handle. Owing to the length of the paper, and its tendency to re-curl, the paper handling devices of shorthand machines have not been entirely satisfactory.

Therefore, one of the objects of this invention is to produce a shorthand machine adapted to unwind and feed the paper from a roll, and also adapted to obviate the labor of handling curly strips of paper. With this object in view the machine includes a paper straightening device adapted to straighten the paper after it passes from the supply roll. More specifically stated, an object of the invention is to produce a simple paper straightening device associated with the other elements of a shorthand machine in such a manner that the desired uncurling or straightening action is obtained without

impairing the operation of the machine. Another object is to produce a typewriting machine having a paper straightener which becomes effective upon the operation of the key levers of the machine.

A further object of the invention is to produce a typewriter having a shearing device for severing the paper and means for straightening the paper before it reaches the shearing device. The shearing device may be operated by hand, or by any suitable automatic mechanism to cut the straightened paper into sheets which may be easily handled by the operator. The preferred form of the invention includes means for forming a longitudinal crease in the paper after it passes from the printing device and before it reaches the shearing device, the object being to straighten the paper by creasing it before it reaches the shearing device and at a point where the crease will not in any way interfere with the action of the printing elements.

With the foregoing and other objects in view the invention comprises the novel construction, combination and arrangement of parts hereinafter more specifically described and illustrated in the accompanying drawings wherein is shown the preferred embodiment of the invention, however, it is to be understood that the invention comprehends changes, variations and modifications which come within the scope of the claims hereunto appended.

Figure I is a longitudinal section of a shorthand machine embodying the features of my invention.

Fig. II is a fragmentary plan view illustrating the paper straightening device.

Fig. III is an enlarged side elevation, partly in section, showing the paper feeding device and the paper straightening device.

Fig. IV is a vertical section taken approximately on line IV—IV, Fig. I, looking toward the front of the machine.

Fig. V is a detail view illustrating the printing device and the means for feeding and straightening the paper.

Fig. VI is an enlarged detail view of the paper creasing rolls.

Fig. VII is an enlarged perspective view of one of the bearings for the lower creasing roll.

To illustrate the preferred form of the invention, I have shown a shorthand ma-

chine provided with a housing 1, a type holder 2 arranged in said housing (Fig. I), a type bar 3 in said type holder, and an inking ribbon 4 adjacent to the line of type on the type bar 3. The paper passes from a supply roll A, over a roller 5, under and partially around a roller 5', in front of and over a roller 6, and then to a paper feeding device whereby it is unwound from the roll and fed through an opening 7 at the rear of the machine, see Fig. I.

The key actuated devices (Fig. I) preferably include a series of angular levers each having an upwardly extending arm 8 at its front end, and a character key 9 at the upper end of said arm. Any suitable shorthand code may be used, and, if desired, the keys may be provided with characters corresponding to the line of type characters on the type bar 3. Each key lever includes an arm 10 extending rearwardly from its arm 8, and an arm 11 extending upwardly from the rear portion of said arm 10. The series of key levers is pivotally supported by a pivot member 12 located at the junctions of the lever arms 10 and 11. The upper end of each lever arm 11 is provided with a forwardly extending printing hammer 13 which lies adjacent to the type 3, as shown most clearly in Figs. I and III. Restoring springs 14 (Fig. I) tend to retain the key levers in engagement with an abutment 15.

When one of the finger keys 9 is depressed, the key lever associated therewith turns about the axis of pivot member 12 and a printing hammer 13 moves toward the type 3, thereby forcing the paper and inking ribbon toward the type and printing one of the type characters on the paper. The key levers may be operated independently of each other, or any desired number of key levers may be operated simultaneously.

The universal bar associated with the key levers includes a transverse abutment holder 18 arranged in front of the series of lever arms 11, and provided with a yieldable abutment 19 which engages all of said lever arms 11. The universal bar also includes a pair of arms 20 and 21 pivotally supported by the pivot member 12, arranged on opposite sides of the lever arms 11 as shown most clearly in Fig. IV, and secured near their upper ends to the transverse abutment holder 18. 22 designates a connecting member uniting the arms 20 and 21 of the universal bar, said connecting member being located at the rear of lever arms 11. 23 designates a restoring spring (Fig. I) tending to retain the universal bar in the position shown in the drawings. The transverse abutment 19, forming part of the universal bar structure, is so arranged that the universal bar will move in response to movements of any one of the key levers.

The paper feeding device preferably comprises a rotatable shaft 32, a pair of feed wheels 33 and 34 fixed to said shaft, a ratchet wheel 35 also fixed to a shaft, and a pawl carrier 36 loosely secured to said shaft. 37 designates a pawl pivoted to the pawl carrier 36, and 38 designates a spring connecting said pawl to the pawl carrier. The spring 38 tends to force the pawl into engagement with the ratchet wheels 35, as shown by dotted lines in Fig. V. The arm 21 of the universal bar is provided with an extension 39 (Figs. IV and V) which co-operates with an arm 40 on the pawl carrier 36. A spring 41, secured to the universal bar, forces the arm 40 into engagement with the universal bar extension 39, said arm 40 being provided with a pad which bears against said extension, as seen in Fig. V. This arm 40, forming part of the pawl carrier 36, is so arranged between the spring 41 and universal bar extension 39, that the pawl carrier will partake of the movements of the universal bar. It will now be understood that the pawl carrier 36, as well as the universal bar, is under the control of the key levers, and that the pawl carrier is adapted to oscillate in response to movements of said key levers.

When a key is depressed, or when several keys are depressed simultaneously, the universal bar moves forwardly and the pawl carrier 36 turns about the axis of shaft 32 so as to advance the ratchet wheel 35 one step, thereby turning the feed wheels 33 and 34 to unwind the paper and advance it one step. At the end of the paper feeding operation, the printing hammer or hammers 13 force the paper and inking ribbon toward the type to print the selected character or characters. Thereafter, the universal bar and key lever or levers return to the position shown in the drawings, and during this movement the paper feeding pawl 37 moves idly along the ratchet wheel 35.

To insure an absolutely positive feeding action, the margins of the paper A' are preferably perforated, as shown in Fig. II to receive the teeth which project from the periphery of the feed wheels 33 and 34. 45 designates presser arms, pivotally supported by stationary arms 46 and provided with grooves 47 (Fig. IV) for the reception of the teeth on the feed wheels. These arms 45 engage the paper at points on opposite sides of the teeth of the feed wheels, so as to positively retain the paper in engagement with said wheels.

Each presser arm 45 is preferably provided with two notches 50 and 51 (Fig. III) adapted to receive a spring pressed detent 52. When the pressing device occupies its operative position (see full lines in Fig. III) each presser arm 45 is retained in engagement with the paper by a detent 52

which lies in a notch 51. In applying a new roll of paper to the machine, the presser arms 45 are shifted away from the feed wheels to an inoperative position (dotted lines in Fig. III) wherein they will permit the paper to be fed, by hand, over the feed wheels. At this time, each presser arm 45 is retained in its inoperative position by a detent 52 which then lies in a notch 51.

10 The means for straightening the paper preferably comprises a creasing roller 53, journaled in the presser arm 45, and provided with an annular rib 53' adapted to enter an annular groove 54' in a roller 54. 15 The roller 54 preferably lies between the feed wheels 33 and 34, and it is rotatably supported by bearing members 55, each of said bearing members being provided with a substantially semi-circular seat 55' (Fig. 20 VII) adapted to receive said roller 54. Since the paper is firmly coiled around the axis of the supply roll, it tends to return to a curly condition after passing from the roll. However, when the paper 25 passes between the creasing rollers 53 and 54 it is uncurled or straightened by the creasing action which takes place at said rolls. The annular rib 53' forces the middle portion of the paper into the annular groove 30 54', thus creasing the paper so as to form a reinforcing rib or ridge which stiffens the paper and prevents it from recurving. The perforations in the margins of the paper are preferably larger than the teeth of the 35 paper feeding wheels, so that the paper will not be torn by the action of the creasing rolls 53 and 54.

After passing from the creasing rolls, the straightened paper advances step by 40 step to a shearing device, whereby it is cut into small uniform sheets. The shearing device I have shown (Fig. I) includes a stationary blade 57 and a movable blade 58. The movable blade may be operable by any 45 suitable automatic mechanism.

The creasing roll 53 is carried by the pivotally supported arms 55 and it is yieldingly held in its operative position by the spring pressed detent 52 (see Fig. III). 50 When the arms 45 are shifted to the position shown by dotted lines in Fig. III, the creasing roll 53 is locked in an inoperative position so that the strip of paper may be readily inserted between the creasing rolls.

55 By locating the creasing rolls 53 and 54 at the path of the paper at a point between the printing device and shearing device, I form a longitudinal crease in the paper at a point where it will not impair the action of 60 the printing elements and at a point where it will straighten the paper before the latter reaches the shearing device.

From the foregoing it will be understood that the creasing rolls I have shown to 65 illustrate the preferred form of the inven-

tion, become effective upon the operation of the paper feeding device, the paper being positively pulled by the paper feeding device and in frictional engagement with the creasing rolls 53 and 54, so that said creasing rolls will rotate in response to movements of the paper feeding device. 70

The printing elements herein shown are claimed in an application for patent filed by me on Nov. 18, 1916, Serial No. 132,076. 75 The key lever guide is claimed in an application filed by myself and W. E. Lippert on Nov. 18, 1916, Serial No. 132,077. The automatic shearing device herein referred to is claimed in an application for patent 80 filed by me on Nov. 18, 1916, Serial No. 132,071. The paper feeding device is claimed in an application filed by myself and W. E. Lippert on Nov. 18, 1916, Serial No. 132,066.

I claim: 85

1. In a typewriting machine adapted to receive a roll of paper, a printing device for printing on the paper, and a paper 90 straightening device including means for creasing the paper.

2. In a typewriting machine adapted to receive a roll of paper, a printing device for printing on the paper, and a paper 95 straightening device including a member having a groove and means for pressing a portion of the paper into said groove.

3. In a typewriting machine adapted to receive a roll of paper, a printing device for printing on the paper, and a paper 100 straightening device adapted to form a longitudinal crease in the paper, said paper straightening device including a rotatable member having an annular groove and a rotatable member having an annular pressing 105 face adapted to press a portion of the paper into said annular groove.

4. In a typewriting machine adapted to receive a roll of paper, a printing device for printing on the paper, and a paper 110 straightening device including two creasing members adapted to cooperate with each other to form a longitudinal crease in the paper, one of said members being movable to an inoperative position, and means for 115 retaining the last mentioned member in its inoperative position.

5. In a typewriting machine adapted to receive a roll of paper, a printing device for printing on the paper, and a paper 120 straightening device including two creasing members adapted to cooperate with each other to form a longitudinal crease in the paper, a pivotal support for one of said creasing members, and a yieldable device 125 tending to retain the last mentioned member in its operative position.

6. In a typewriting machine adapted to receive a roll of paper, a printing device for printing on the paper, and a paper 130 straightening device including two creasing

members adapted to cooperate with each other to form a longitudinal crease in the paper, a pivotal support for one of said creasing members, and a yieldable device adapted to retain the last mentioned creasing member in its inoperative position.

7. In a typewriting machine adapted to receive a roll of paper, a printing device for printing on the paper, and a paper straightening device including two creasing members adapted to cooperate with each other to form a longitudinal crease in the paper, a pivotal support for one of said creasing members, and a yieldable device adapted to retain the last mentioned creasing member in either its operative or inoperative position.

8. In a typewriting machine adapted to receive a roll of paper, a printing device for printing on the paper, and a paper straightening device including a creasing roll, a bearing to which said creasing roll is rotatably fitted, a second creasing roll adapted to cooperate with the first mentioned creasing roll to form a longitudinal crease in the paper, bearing arms to which said second creasing roll is rotatably fitted, and a pivotal support for said bearing arms.

9. In a typewriting machine adapted to receive a roll of paper, a paper feeding device arranged to grip the margins of the paper, and a paper straightening device adapted to engage the paper at a point between said margins.

10. In a typewriting machine adapted to receive a roll of paper, a paper feeding device arranged to grip the margins of the paper, and a paper straightening device provided with means for creasing the paper at a point between said margins.

11. In a typewriting machine adapted to receive a roll of paper, a printing device, a paper feeding device arranged to grip the margins of the paper, and a paper straightening device provided with means for creasing the paper at a point between said margins, said means being located in the path of the paper at a point substantially between said printing device and paper feeding device.

12. In a typewriting machine adapted to receive a roll of paper, a printing device for printing on the paper, and a paper straightening device including creasing means adapted to crease the paper after it passes from said printing device.

13. In a typewriting machine adapted to receive a roll of paper, a printing device for printing on the paper, and a paper straightening device including creasing members arranged at the path of the paper and adapted to form a longitudinal crease in the paper after it passes from said printing device.

14. In a typewriting machine adapted to

receive a roll of paper, a printing device for printing on the paper, a shearing device for severing the paper, and a paper straightening device including creasing members located at the path of the paper and at a point between said printing device and shearing device, said creasing members being adapted to form a longitudinal crease in the paper after it passes from said printing device and before it reaches said shearing device.

15. In a typewriting machine adapted to receive a roll of paper, a printing device for printing on the paper, a shearing device for cutting the paper, rotatable creasing rolls located at the path of the paper and at a point between said printing device and shearing device, one of said creasing rolls being provided with a groove and the other being provided with a pressing face adapted to force a portion of the paper into said groove, so as to form a longitudinal crease in the paper after it passes from said printing device and before it reaches said shearing device.

16. In a typewriting machine adapted to receive a roll of paper, a printing device for printing on the paper, a paper feeding device adapted to engage the margins of the paper, and a paper straightening device including creasing members adapted to crease the paper at a point between said margins.

17. In a typewriting machine adapted to receive a roll of paper, a printing device for printing on the paper, a paper feeding device adapted to engage the margins of the paper, and a paper straightening device including rotary creasing members located between the margins of the paper, one of said rotary creasing members being provided with a groove and the other being provided with a pressing face adapted to force a portion of the paper into said groove, so as to form a longitudinal crease in the paper at a point between its marginal portions.

18. In a typewriting machine adapted to receive a strip of paper having perforations in its margins, a printing device for printing on the paper at points between the perforations, a paper feeding device including feed wheels having peripheral teeth adapted to enter the perforations at opposite sides of the printed matter, and a paper straightening device including a member having a groove, and means for pressing a portion of the paper into said groove, said means being arranged to act on the paper at a point between said perforations.

19. In a typewriting machine adapted to receive a strip of paper having perforated margins, a paper feeding device including feed wheels having peripheral teeth adapted to enter the perforations, a presser member for retaining the paper in engagement with said feed wheels, and paper straightening

members associated with said presser member.

20. In a typewriting machine adapted to receive a strip of paper having perforated margins, a paper feeding device including feed wheels having peripheral teeth adapted to enter the perforations, a presser member for retaining the paper in engagement with said feed wheels, and a paper straightening device including a creasing member associated with said presser member so as to form a longitudinal crease in the paper at a point between said perforated margins.

21. In a typewriting machine adapted to receive a strip of paper having perforated margins, a printing device for printing on the paper at points between the perforations, a paper feeding device including feed wheels having peripheral teeth adapted to enter the perforations, and a paper straightening device associated with said feed wheels, said paper straightening device being adapted to crease the paper at a point between said feed wheels, and the peripheral teeth of said feed wheels being smaller than the perforations in the paper.

22. In a typewriting machine adapted to receive a roll of paper, a printing device, a paper feeding device adapted to feed the paper to and from said printing device, and a paper straightener associated with said printing device and paper feeding device, said paper straightener including creasing members which become effective upon the operation of said paper feeding device.

23. In a typewriting machine adapted to receive a roll of paper, a printing device, a paper feeding device adapted to feed the paper to and from said printing device, a

paper straightening device adapted to form a longitudinal crease in the paper, and means for operating all of said devices simultaneously.

24. In a typewriting machine adapted to receive a roll of paper, a printing device, a paper feeding device adapted to feed the paper to and from said printing device, a paper straightening device adapted to form a longitudinal crease in the paper, and means for operating all of said devices simultaneously, said means including a universal bar for operating said paper feeding device.

25. In a typewriting machine adapted to receive a roll of paper, a printing device, a paper feeding device adapted to unwind and feed the paper to and from said printing device, and a paper straightener including a creasing device associated with said paper feeding device, operating means including a universal bar for actuating said paper feeding device, said creasing device being effective upon the operation of said paper feeding device.

26. In a typewriting machine adapted to receive a roll of paper, a printing device, a paper feeding device adapted to unwind and feed the paper to and from said printing device, a paper straightener including a creasing device associated with said printing device and paper feeding device, keys, and key controlled means for operating said printing device and paper feeding device, the paper feeding device being movable step by step in response to movements of said keys, and said creasing device being operable in response to movements of said paper feeding device.

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