No. 826,203. PATENTED JULY 17, 1906.

H. E. WAITE.

LETTER FEEDING MECHANISM.

APPLICATION FILED MAR. 18, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

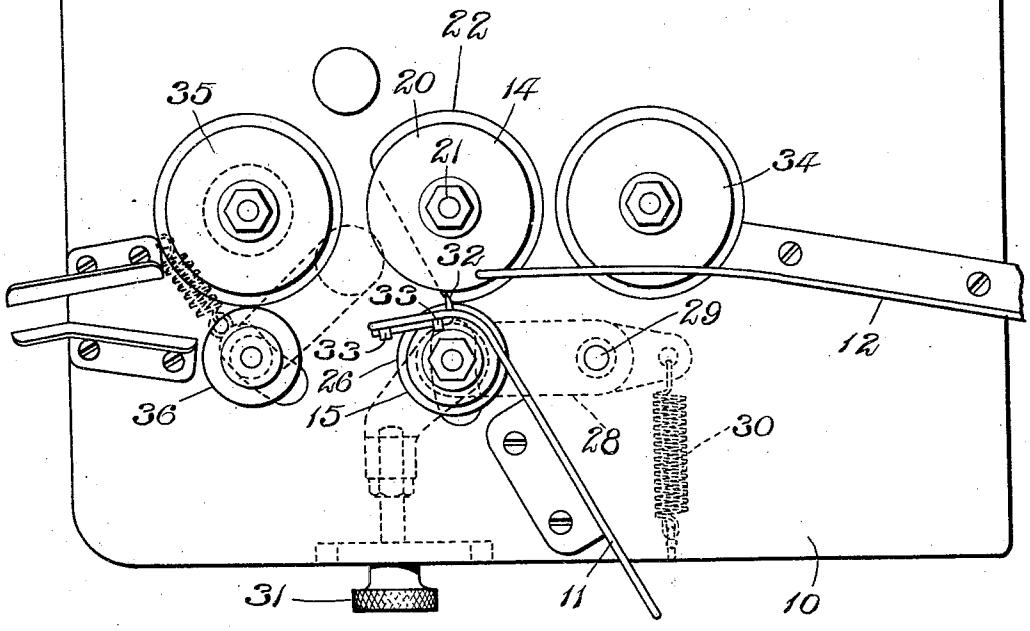
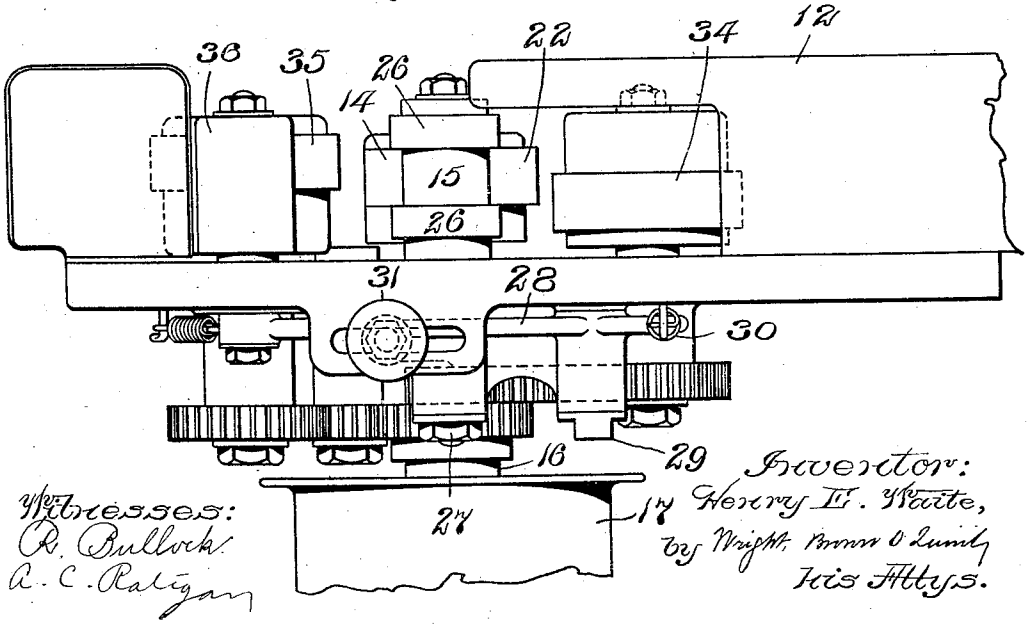


Fig. 2.



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Fig. 3.

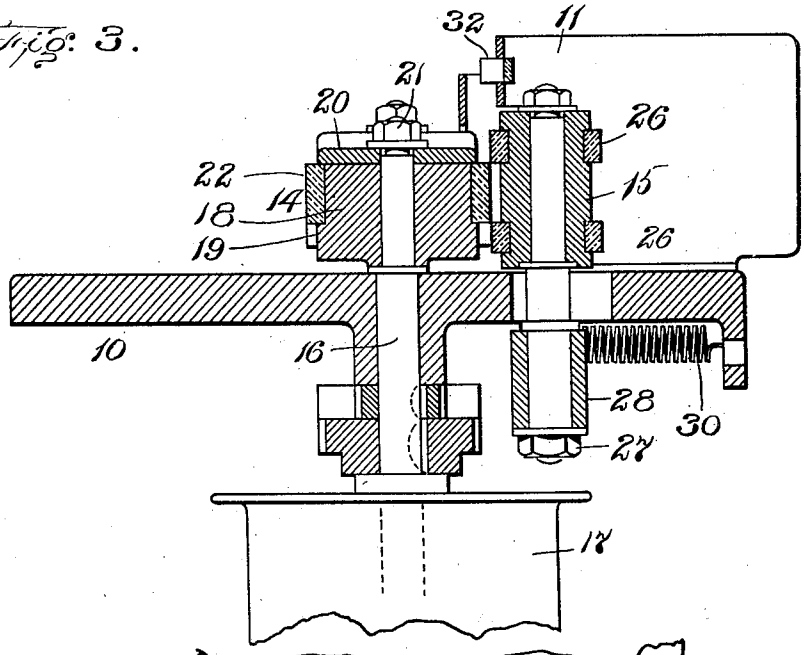


Fig. 4.

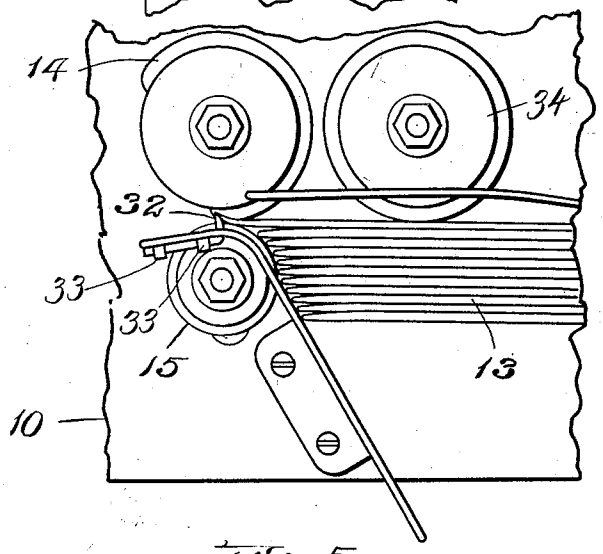
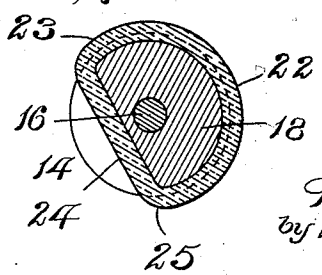


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY E. WAITE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE AMERICAN POSTAL MACHINES COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

LETTER-FEEDING MECHANISM.

No. 826,203. Specification of Letters Patent. Patented July 17, 1906.

Application filed March 18, 1904. Serial No. 198,749.

To all whom it may concern:

Be it known that I, HENRY E. WAITE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Letter-Feeding Mechanisms, of which the following is a specification.

The invention relates to feeding mechanism for automatically separating and feeding individual letters from the face of a pack, so that the letters may be rapidly presented in succession to the marking device of a post marking and canceling machine.

In practicing my invention I provide a feeding member and an opposed coacting separating member, each member being provided with frictional engaging surfaces for acting upon the letters, the engaging surface on one member being out of register with the engaging surface on the other member, so that the pressure of the coacting members upon opposite sides of the letter tends to buckle the letter, and thus separate it laterally to some extent from the adjacent letter of the letter-pack. This arrangement of the frictional engaging surfaces of the opposed feeding and separating members also results in a more efficient retarding action on the part of the separating member in case the second letter tends to crowd past the separating member. With this arrangement of the frictional engaging surfaces the tendency for the second letter to crowd past the separating member is also less than in cases where the frictional surface of the two members are arranged to register, so that the passing letter is clamped directly between the opposed surfaces of the two members.

I prefer in practicing my invention to increase the certainty with which the individual letters are separated from the pack by providing a device which engages the front edge of the letter on the face of the pack and bends it laterally away from the succeeding letters of the pack, thus effecting a lateral separation of the first letter from the face of the pack, so that the tendency for the second letter to accompany the first letter in its forward movement is decreased. This device for effecting a lateral separation of the letter at the face of the pack preferably consists of a yieldingly-mounted finger projecting across the throat formed between the feeding and separating members and arranged to press the leading end of the letter to one side of the plane of movement of the feeding-surface and to maintain this deflecting pressure during the passage of the letter. The finger thus acts not only as a deflecting-finger for effecting lateral separation of the letter from the pack, but acts also to resist any tendency of the succeeding letters to move forward with the letter at the face of the pack. In order that this separating-finger may act efficiently on thin as well as thick letters, I prefer to so arrange the finger that it extends beyond the periphery of the feeding member. I also prefer to provide for the yielding of said finger by forming the finger of a resilient and flexible material, such as rubber, although this construction is not essential. I also prefer to mount the finger so that it extends above the frictional engaging surface of the feeding member, although this position with relation to the feeding-surface is not essential.

In embodying the broader features of my invention in a simple and efficient construction which may be conveniently and cheaply constructed and adjusted to compensate for wear upon the parts I have employed certain further features of invention relating more particularly to the details of construction, which are of advantage, although they are not essential to the broader features of the invention.

The various features of the invention will be pointed out in the claims and will be understood from the following detailed description of the feeding mechanism shown in the accompanying drawings, which embodies such features in the forms in which I prefer to use them.

In the drawings, Figure 1 is a plan view of a letter-feeding mechanism embodying the various features of my invention. Fig. 2 is a front elevation with one of the guide-plates for the stack removed. Fig. 3 is a transverse vertical section through the letter feeding and separating members. Fig. 4 is a plan view showing the action of the feeding and separating members, and Fig. 5 is a horizontal section of the rotary letter-feeding member.

In the construction shown in the drawings the letter-pack is supported upon edge upon a horizontal table 10, the front of the pack being pressed against the vertical front guide 12 and the position of the forward end of the pack being determined by the guide-plate 11. The devices for separating and feeding forward individual letters from the face of the pack comprise a feeding member 14 and an opposed coöperating separating member 15, which form a feeding-throat at the front and forward end of the pack into which the letters at the face of the pack are advanced by the feeding member. The feeding member 14 is mounted upon a shaft 16, provided with a belt-pulley 17, to which power is applied for continuously rotating the feeding member. The frictional feeding-surface 22 of the feeding member is formed by the concentric portion 23 of a rubber band, which is mounted upon the body 18 of the feeding member and is clamped in position between a lower flange or shoulder 19 and an upper circular clamping-plate 20 by means of a nut 21, threaded upon the upper end of the shaft 16. The body portion 18, about which the rubber band is stretched, is segmental in cross-section, so that the feeding member is provided with a segmental feeding-surface, the advancing end 25 of which provides a corner or abutment for effectively gripping the surface of the letter and starting it forward, the forward movement of the letter being continued by the concentric tread of the frictional feeding-surface.

While the frictional surface of the feeding member may be constructed in any suitable manner, the construction above described is especially advantageous, since the band 22 may be readily adjusted in case the starting-corner 25 becomes worn, and also for the reason that it affords a simple construction in which a minimum amount of rubber is employed and in which the feeding-tread may be readily and efficiently secured in position and may be readily removed or renewed.

The separating member 15, which coöperates with the feeding member in separating individual letters from the pack, comprises a cylindrical body portion provided with frictional bearing-surfaces consisting of rubber rings 26 26, which are so arranged that they are out of register with the bearing-surface 22 of the feeding member, the rings in the construction shown being arranged above and below the bearing-surface of the feeding member. The separating member is mounted upon an arm 28, pivoted at 29 and operated upon by a spring 30, which tends to force the separating member toward the feeding member 14. The forward position of the separator member is determined by an adjustable screw-stop 31, by means of which the forward position of the separating member may be adjusted to secure the best results. The separating member acts to hold back or resist the forward movement of the letters in the pack, and in the construction shown this action is provided for by securing the separating member against rotation in the arm 28, the separating member being rigidly secured to a stud, which is clamped in the arm 28 by a nut 27, Fig. 3. By loosening the nut 27 the separating member 15 may be readily adjusted to bring a new portion of the rings 26 26 into position to act upon the letter as the surface of the rings becomes worn.

In acting upon the letter-pack the feeding member acts intermittently by reason of the fact that its letter-propelling surface is a segmental surface, and during the interval between the successive actions of the feeding-surface the forward end of the pack lies close to or against the periphery of the clamping-plate 20 and of the flange 18. When the corner or abutment 25 at the front end of the feeding-surface 22 strikes the letter-pack, the pack is moved laterally, and at the same time the letter at the face of the pack is started forward between the feeding member and the separating member. Since the engaging surface 22 of the feeding member is out of register with the bearing-surface formed by the rings 26 on the separating member, the pressure exerted on opposite sides of the letter by the bearing-surfaces of the feeding member and separating member tends to buckle or bend the letter transversely, and thus tends to loosen and separate the letter from the second letter in the pack, so that there is less tendency for the second letter to accompany the first letter in its forward movement. In order that the separating and feeding members may coöperate in the most efficient manner, even when acting upon the thinner letters, it is desirable to so adjust the separating member that the engaging surfaces on the feeding and separating members will overlap or intersect to a slight extent.

While I prefer to arrange the feeding and separating surfaces in the relation shown, it will be understood that this specific arrangement is not essential to the feature of providing separating and feeding surfaces which are out of register and that the relative arrangement may be reversed or otherwise changed.

In order to facilitate the separation of individual letters from the face of the pack and to render the operation of the feeding and separating devices more efficient, I have combined with these devices a separating-finger 32, arranged across the throat formed between the feeding and separating surfaces and acting to deflect the advancing letter in a direction away from the pack. This lateral

deflection of the advancing letter has the effect of decreasing the friction of the first letter upon the second letter in the pack, and consequently reduces the tendency of the second letter to pass forward with the first letter, thereby supplementing the separating action of the separating device. In order that the separating-finger may thus deflect the first letter away from the succeeding letters, the fingers should engage the letter at a point where the letter is not directly supported by an opposing engaging surface, and in the construction shown this finger is arranged above and therefore out of register with the feeding-surface of the feeding member and where it may act to bend that part of the letter which lies above the feeding-surface laterally away from the second letter of the pack. In order to act most efficiently, this finger should be so mounted or constructed that it may yield to allow the passage of varying thicknesses of letters and also in order that it may not offer undue resistance to the passage of letters which are not readily deflected. In the construction shown the yielding of the finger is provided for by forming the finger of rubber and securing the finger in supports 33 upon the guide-plate 11. The finger may be adjusted in the supports 33 to bring it into proper position across the feeding-throat and to vary the extent to which it projects across said throat.

The efficiency of the separating-finger is increased, especially in acting upon the thinner letters, by so adjusting the finger that it projects beyond the periphery of the feeding member. In cases where, as in the construction shown, the feeding member is provided with a segmental feeding-surface this finger may also act as a stop for positioning the forward end of the letter and preventing its creeping forward beyond the line of action between the separating and feeding members during the time that the feeding-surface is out of register with this line of action.

If found desirable, a feeding-roll 34 may be mounted upon the table 10 in advance of the feeding member 14, this roll tending to keep the forward end of the pack against the guide 11 and also tending to bring the letter on the face of the pack against the finger 32 and into position to be efficiently acted upon by the feeding-segment of the feeding member when said feeding-segment comes into action.

By the action of the separating and feeding devices the letters at the face of the pack are rapidly separated and fed forward one after another between the feeding and separating members and presented to advancing-rolls 35 36, which act to continue the movement of the letters toward the marking devices.

Without attempting to set forth in detail the various changes and modifications which may be made in practicing the various features of my invention, what I claim, and desire to secure by Letters Patent, is—

1. A letter-feeding mechanism having in combination a feeding member, a separating member, and means for deflecting the foremost letter laterally away from the next adjacent letter of the pack and beyond the plane of action of the feeding member.

2. A letter-feeding mechanism having in combination a letter-feeding member, an opposed separating member, and a separating-finger arranged above the feeding member to deflect the foremost letter laterally away from the face of the letter-pack.

3. A letter-feeding mechanism having in combination, a feeding member, a separating member on the opposite side of the letter-path, and a separating-finger on the same side of the letter-path with the separating member and projecting across the letter-path beyond the plane of action of the feeding member.

4. A letter-feeding mechanism having in combination, feeding and separating members having a feeding-throat between them for the passage of letters, and a separating-finger on the same side of the letter-path with the separating member and projecting across the path of the letters beyond the periphery of the feeding member and out of register with the feeding member.

5. A letter-feeding mechanism having in combination, feeding and separating members provided with frictional letter-engaging surfaces, a separating-finger on the same side of the letter-path with the separating member and projecting across the path of the letters and beyond the periphery of the feeding member.

6. A letter-feeding mechanism having in combination, feeding and separating members forming a throat between them for the passage of letters, and a yielding separating-finger on the same side of the letter-path with the separating member and projecting across the path of the letters and beyond the periphery of the feeding member.

7. A letter-feeding mechanism having in combination, feeding and separating members provided with frictional letter-engaging surfaces, and a yielding separating-finger on the same side of the letter-path with the separating member and projecting across the letter-path and beyond the periphery of the feeding member.

8. A letter-feeding mechanism having in combination, a feeding member provided with a segmental feeding-surface, a separating member provided with a frictional letter-engaging surface, and a yielding finger on the same side of the letter-path with the separating member and projecting across the feed-

ing-throat between the feeding and separating members and extending beyond the periphery of the feeding member.

9. A letter-feeding mechanism having in combination, feeding and separating members provided with frictional letter-engaging surfaces, and a yielding separating-finger on the same side of the letter-path with the separating member and projecting across the letter-path above the feeding member.

In testimony whereof I have affixed my signature in presence of two witnesses.

HENRY E. WAITE.

Witnesses:
R. M. PIERSON,
A. C. RATIGAN.