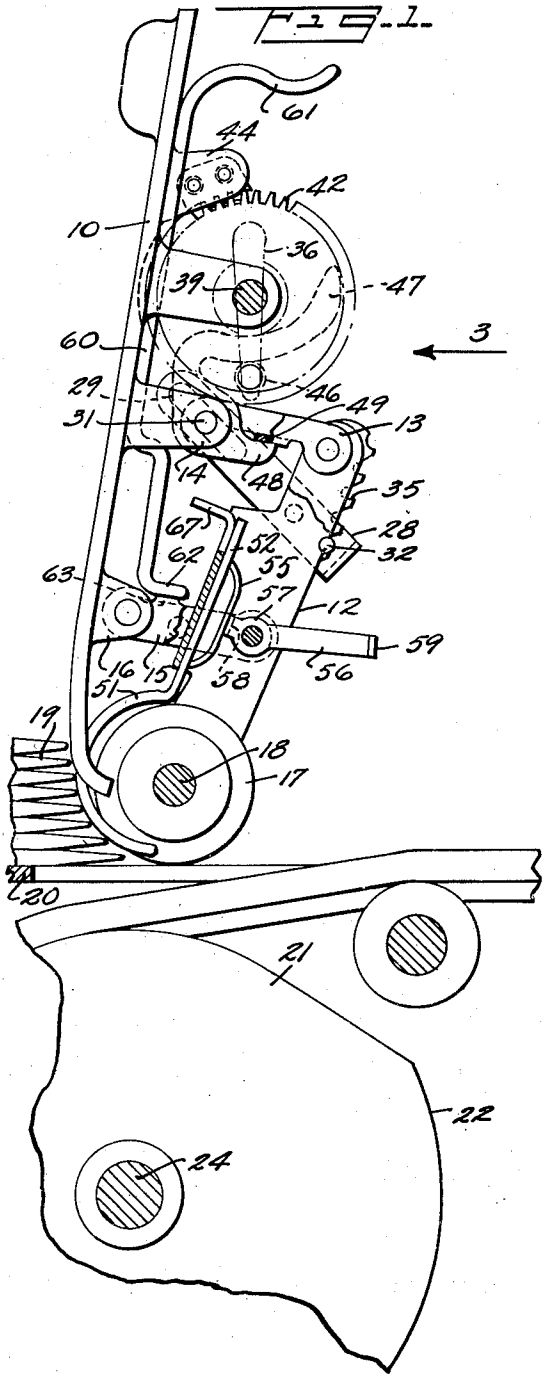
Feb. 17, 1942. F. J. ROUAN 2,273,288

ADJUSTABLE SEPARATOR

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FIG. 1.



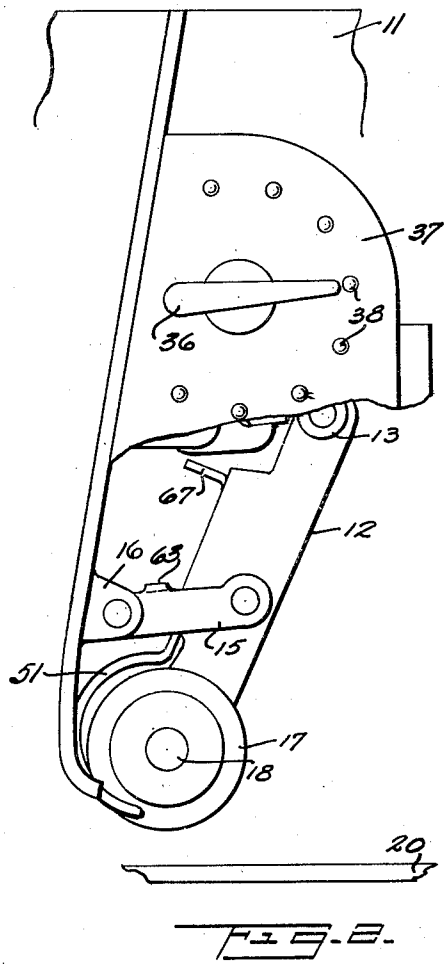




FIG. 2.

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FIG. 3.

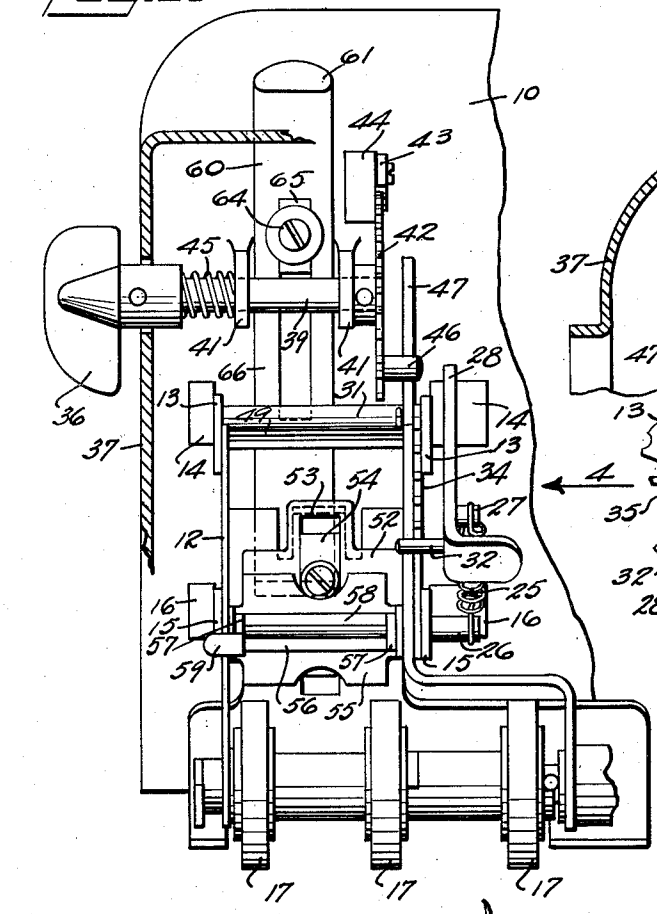



FIG. 4.

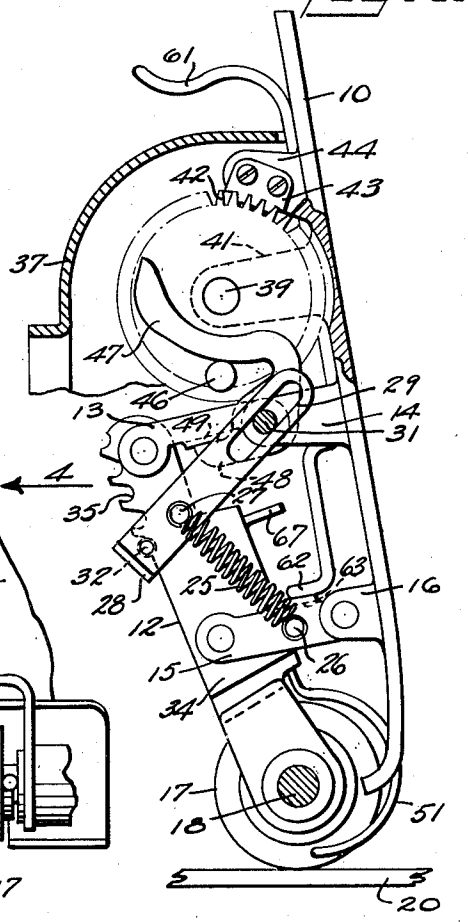
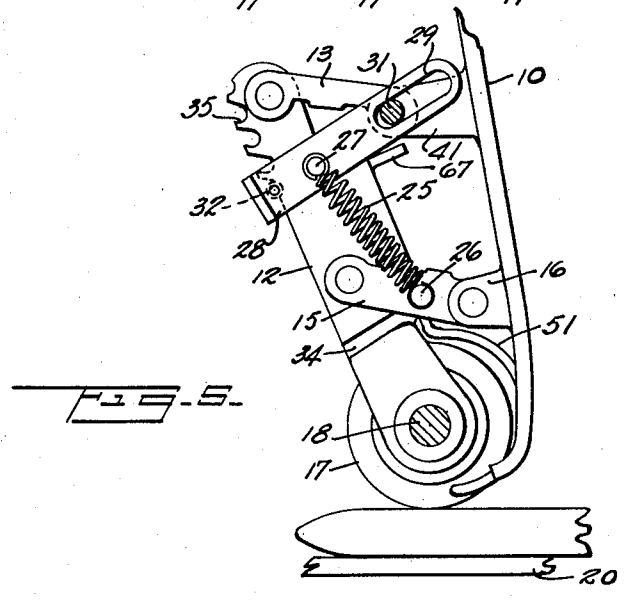



FIG. 5.




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# UNITED STATES PATENT OFFICE

2,273,288

## ADJUSTABLE SEPARATOR

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Application February 5, 1941, Serial No. 377,462

10 Claims. (Cl. 271—35)

This invention relates to means for stripping letters from the bottom of a stack of superimposed letters prior to the feeding of the same to a mailing machine or the like, and is more particularly related to a separator unit and means for the adjustment of same.

In feeding letters to a mailing machine from a stack of superimposed letters, it is common practice to engage the bottom of the lowermost letter in the stack with some friction device to strip said letter and move same to a letter feeding position. To prevent the letter directly above from being carried forward with the one which is being stripped, an obstruction is provided in the form of a separator roller unit, which is positioned directly in front of the letters.

The letters may vary in thickness from a very thin air-mail letter, of perhaps $\frac{1}{32}$ of an inch, to a very bulky letter of perhaps ½ inch in thickness. The envelope paper will also vary in quality from a light tissue to a hard and glossy surfaced heavy paper.

To accommodate the conditions arising in the separation of letters of varying thicknesses and having varying grades of envelope paper, provision is made for adjustment of the tension applied by the separator unit upon the letters. Provision is further made for maintaining a substantially equal tension regardless of the thickness of the letters passing beneath the separator rollers after an adjustment is once made.

The principal object of this invention therefore, is to provide means whereby a separator unit may yield under a substantially constant tension as letters of varying thicknesses pass therebeneath.

It is a further object to provide means whereby the yieldable tension means may be manually adjusted to increase or decrease the said tension.

It is another object to provide an improved manual means of adjustment for the adjustment of the separator frame, including means for locking said manual means after an adjustment is made.

It is also an object to provide means for the adjustment of a guard member which limits the exposure of the frictional surface of the separator rollers to the letter which is stripped from the stack.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that various changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

A preferred embodiment of the invention is illustrated in the accompanying drawings, wherein:

Fig. 1 is a side elevational view, with parts in section, of a separator unit including a letter stripper means;

Fig. 2 is a view similar to Fig. 1, showing a manual adjusting means positioned outside of the separator cover and with the separator unit adjusted to an intermediate position;

Fig. 3 is a front elevational view with parts broken away and parts in section, taken in the direction of the arrow 3 on Fig. 1;

Fig. 4 is a side elevational view with parts broken away and parts in section, taken in the direction of the arrow 4 on Fig. 3; and

Fig. 5 is a detailed view of a portion of Fig. 4, showing the yieldability of the separator frame structure and particularly indicating the similar tension of the tension spring in comparison with the tension spring with the frame in the position of Fig. 4.

Referring to the drawings in detail, a support 10, carried by a machine base 11, has a separator roller frame 12 yieldably mounted thereon. The mounting for said frame 12 is in the form of a pantograph and includes an upper pair of arms 13—13, and a lower pair of arms 14—14. The upper arms 13—13 connect the upper end of the frame 12 with ears 14—14 projecting from the support 10, and the lower arms 15—15 connect the frame 12 with ears 16—16, projecting from the support 10. Friction rollers 17 are supported at the lower end of the frame 12 on a shaft 18 and normally lie in the path of a stack of superimposed letters 19, supported upon a feed plate 20.

By means of a suitable feed, such as indicated in Fig. 1, the lowermost letter is adapted to be stripped from the stack of superimposed letters, during each cycle of machine operation, by a stripper wheel 21. Said wheel 21 has a bump 22 thereon and a frictional belt 23, which belt is adapted to be moved into engagement with the lowermost letter as the bump portion 22 moves therepast. Said stripper wheel 21 is also mounted on a shaft 24 and may be driven in any suitable manner.

By means of an anti-reverse member, the rollers 17 are prevented from rotating in a counter-

clockwise direction as viewed from Fig. 1, so that as the lowermost letter is moved therepast, the rollers will frictionally engage the upper surface of the letter and prevent more than the one letter from passing therebeneath. To distribute wear resulting from the frictional engagement between the letters and rollers, means is provided to rotatively adjust the rollers during each cycle of operation. Said anti-reverse and roller adjusting means form the subject matter of another application Serial Number 376,284 and therefore, will not be further described.

To further assist the frictional qualities of the rollers 17, tension means is provided to urge the frame 12 downwardly. It is particularly desirable to provide such tension in a manner which will effect a substantially equal tension for varying thicknesses of letters which pass beneath the rollers. To accomplish the latter, a tension spring 25 is provided, which has one end anchored to a pin 26 on one of the lower arms 15, as best shown in Figs. 4 and 5, while the other end is anchored on a pin 27 projecting from a manually adjustable arm 28. Said arm 28 has an elongated slot 29 at its rearward end, and is supported on a rod 31, carried by the ears 14—14, which ears support the inner ends of the upper arms 13—13. Said adjustable arm 28 also has a pin 32 projecting therefrom at its forward end, and attached to one side of the separator frame 12 is a plate 34, having notches 35 in the upper forward edge thereof.

The arm 28 is adapted to be adjusted to change the tension of the spring 25 so that a greater or lesser force may be effected by the separator rollers on the letters passing therebeneath. Said adjustment is made by moving the pin 32 of the arm 28 into any one of the notches 35. When the pin 32 is in the lowest notch 35, the minimum tension is exerted on the separator bracket, whereas, when the pin is engaged with the upper notches 35, maximum tension is exerted.

It will be noted in the examples shown in Figs. 4 and 5, that the spring when in its normal rest position, as in Fig. 4, has substantially the same tension as it does in Fig. 5, after the separator frame has been raised to approximately its maximum position by a heavy piece of mail. This same condition prevails for the several settings of adjustments which the arm 28 may be placed in and produces a definite advantage where the letters of varying thicknesses passing beneath the separator have the same quality of envelope.

The tension of the spring 25 is originally determined by the serviceman when a machine is installed, and so long as the operator continues to use the same quality of envelopes for which the tension was originally set, or something similar thereto, the original setting will remain indefinitely. If there is a departure from the quality of envelopes used and trouble is experienced in separating, the spring tension will usually require readjustment to suit the new conditions.

While the aforesaid spring tension is preferably controlled by a serviceman, there is also provided means whereby an operator may adjust the separator bracket as a whole, to raise or lower the rollers 17 and thereby control separation of letters of varying thicknesses. Said latter setting is adapted to be effected by means of a manipulative handle 36, which is exposed outside of a casing 37 covering the separator unit. The handle is preferably shaped to form a pointer, as indicated in Fig. 2, and graduations are provided as shown at 38, on the side of the casing 37.

The handle 36 is fixed to a shaft 39, which shaft is carried in bearings 41—41, and has a gear 42 fixed to the inner end thereof. A toothed stop 43 is fixed to a lug 44, on the support 10, and is normally adapted to be engaged by the teeth of the gear 42, as best shown in Figs. 3 and 4. A spring 45 around the shaft 39, between the bearing 41 and hub portion of handle 36, is adapted to urge the shaft sideward in a direction which will maintain the teeth of the gear 42 in engagement with the teeth of the stop 43. When however, the said shaft 39 is moved axially inward, by depressing the handle 36 toward the casing 37, the gear 42 will be disengaged from the toothed stop 43, and may then be rotated to effect an adjustment of the separator roller bracket. When said handle 36 is rotated, a pin 46 on the gear 42, is rotated through an arcuate path to adjust the position of a cam member 47, which cam member is associated with the separator frame 12, and is pivotally mounted upon the rod 31 in bearings 14—14. Said cam member 47 has a toe portion 48 provided at the lower end thereof which normally engages a bridge portion 49, connecting the two upper arms 13—13 of the separator bracket 12.

The tension of the spring 25 normally urges the separator roller frame downward and therefore urges the bridge portion 49 against the toe portion 48, and the cam member 47 against the stop pin 46. Motion of the cam member 47 is prevented however, until the gear 42 is moved free of the toothed stop 43. When therefore, the gear 42 is free for rotation by means of the handle 36, the pin 46 will move across the cam surface of the cam member 47 to rock said cam member and adjust the roller frame 12. After an adjustment is made, the cam member 47 is again locked in its adjusted position by the engagement of the gear 42 with the stop 43, so that vibration caused by the operation of the machine will not effect any change in the adjustment.

It is also desirable to combine a guard member with a separator unit of this type as indicated at 51. Said guard member has a curved portion starting from the bottom of the separator wheels 17 and curving to the rear of the wheels to form a shield which will be engaged by the letters before said letters engage the frictional surfaces of the rollers 17. Projecting upwardly from the curved shield portion is a backing portion 52, which has an elongated slot 53 therein, and within the slot 53 is a guide strip 54, supported by the separator roller frame 12.

To provide for the best letter stripping conditions, the shield portion of the guard member 51 is positioned so that its lower curved surface is about $\frac{1}{16}$ of an inch from the lower surfaces of the friction wheels. As wear occurs, this distance is reduced and will eventually interfere with the separation of letters. An adjustment is then made to move the said guard upward, which adjustment is provided by means of an arcuate leaf spring member 55 and a clamp 56. The clamp comprises a U-shaped member, including two legs 57—57 and a bridging portion 58. One leg is extended to form a convenient finger grip as at 59. When an adjustment is to be made, the finger grip 59 is rocked to release the clamping effect of the bridge portion 58 against the spring 55, thereby releasing the spring pressure and freeing the guard. When adjusted

to the desired position, the said guard is again clamped in place by moving the clamp 56 to a clamping position with relation to the spring member 55.

Occasionally when assorted mail is run through the machine it may be difficult for one of the pieces to get past the separator rollers. For this purpose the entire separator frame is adapted to be lifted by means of a handle 61 which projects above the top of the casing 37. As best shown in Fig. 1, said handle 61 is formed at the upper end of a metal strap 60 and a foot 62 is formed at the lower end thereof, which foot normally rests upon a bridging portion 63, connecting the lower arms 15—15. The metal strap 60 is guided along the back wall of the support 10 by means of a block 65 on the wall of support 10, which block projects within a slot 66 in the strap 60. An overlapping washer 64, screwed to the block 65, is provided to hold the strap 60 in position on the block 65. When said handle 61 is lifted the foot 62 is adapted to engage with an outwardly turned end 67 on the separator roller bracket to thereby effect the lift of said bracket momentarily.

Having described the invention what is claimed is:

1. In a yieldable letter feed separator unit arranged to obstruct the passage of all except the lowermost letter from a stack of letters, a support, a separator frame carried by said support and having friction means thereon engagable with the upper surface of the lowermost letter when said letter is stripped from the stack, spring means urging said friction means against the upper surface of the letter which is stripped, and means for mounting said spring means so that each end of the spring is movable with the frame.

2. In a yieldable letter feed separator unit arranged to obstruct the passage of all except the lowermost letter from a stack of letters, a support, a separator frame having friction means thereon engagable with the upper surface of the lowermost letter when said letter is stripped from the stack, spring means urging said friction means against the upper surface of the letter which is stripped, an arm linking the frame to the support, and a mounting for said spring means including an anchor for one end on the frame and an anchor for the other end on the said arm so that the entire spring means is movable with the frame.

3. In a yieldable letter feed separator unit arranged to obstruct the passage of all except the lowermost letter from a stack of letters, the combination with a stationary support, a frame member having upper and lower arms pivotally linking the frame to the support in pantograph fashion, and rollers supported at the lower end of the frame; of a spring having one end anchored to the lower arm, and the opposite end anchored to the said frame, to thereby urge the frame downward and to apply substantially equal tension as the frame is raised during the feeding of a letter beneath the rollers.

4. In a yieldable letter feed separator unit arranged to obstruct the passage of all except the lowermost letter from a stack of letters, the combination with a stationary support, a frame member having uper and lower arms pivotally linking the frame to the support in pantograph fashion, and rollers supported at the lower end of the frame; of a spring having one end anchored to the lower arm, an adjustable lever pivotally movable with the upper arm and having the other end of the spring anchored thereto, and means to support the free end of the lever on said frame, whereby the frame is urged downwardly under a tension which remains substantially equal during varying positions of the frame resulting from the letters of varying thicknesses passing under the separator rollers.

5. In a letter feed separator unit, the combination with a support, a frame member having upper and lower arms pivotally linking the frame to the support in pantograph fashion; of a spring having one end anchored to the lower arm, a notched member on said frame, a pivotal arm having the other end of the spring anchored thereon, and one end of said pivotal arm being adjustably engageable with a notch in said notched member.

6. The combination with a yieldable separator frame having frictional rollers mounted at the lower end thereof; of a spring urging said frame downwardly, a manually adjustable stop, means urged into engagement with said stop by said spring, said means having a connection with the frame to determine the position at which the frame is to be maintained, and means to lock the stop in an adjusted position.

7. The combination with a yieldable separator frame having frictional rollers mounted at the lower end thereof; of a spring urging said frame downwardly, a manually rotatable member having a stop thereon, a cam member associated with the frame and urged by the spring into engagement with said stop to determine the position at which the frame is to be maintained, and means to lock the stop in an adjusted position.

8. The combination with a yieldable separator frame having frictional rollers mounted at the lower end thereof; of a spring urging said frame downwardly, a manually rotatable toothed member, a stop pin projecting from said toothed member, a cam member associated with the frame and urged by the spring into engagement with said stop to determine the position at which the frame is to be maintained, a stationary toothed member normally engaged by the rotatable toothed member to lock the stop in an adjusted position, and means to disengage the rotatable toothed member from engagement with the stationary toothed member to permit adjustment of the stop and consequently the separator frame.

9. The combination with a yieldable separator frame having frictional rollers mounted at the lower end thereof; of a spring urging said frame downwardly, a manually rotatable and longitudinally adjustable member, a stop carried by said adjustable member, means associated with said frame and engaging said stop to establish the position of the frame, means to lock the adjustable member in an adjusted position, said lock being releasable when the adjustable member is adjusted longitudinally.

10. In a letter feed separator unit, a yieldable frame having frictional rollers mounted at one end thereof, a guard member partially covering said rollers to restrict the exposed portion of the frictional working surface of said rollers, and clamp means including an arcuate spring member, and a lever controlled clamp member applying tension to the guard member through the spring member when set in a clamped position, said lever being quickly releasable to permit adjustment of the guard member when wear of the rollers occurs.

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