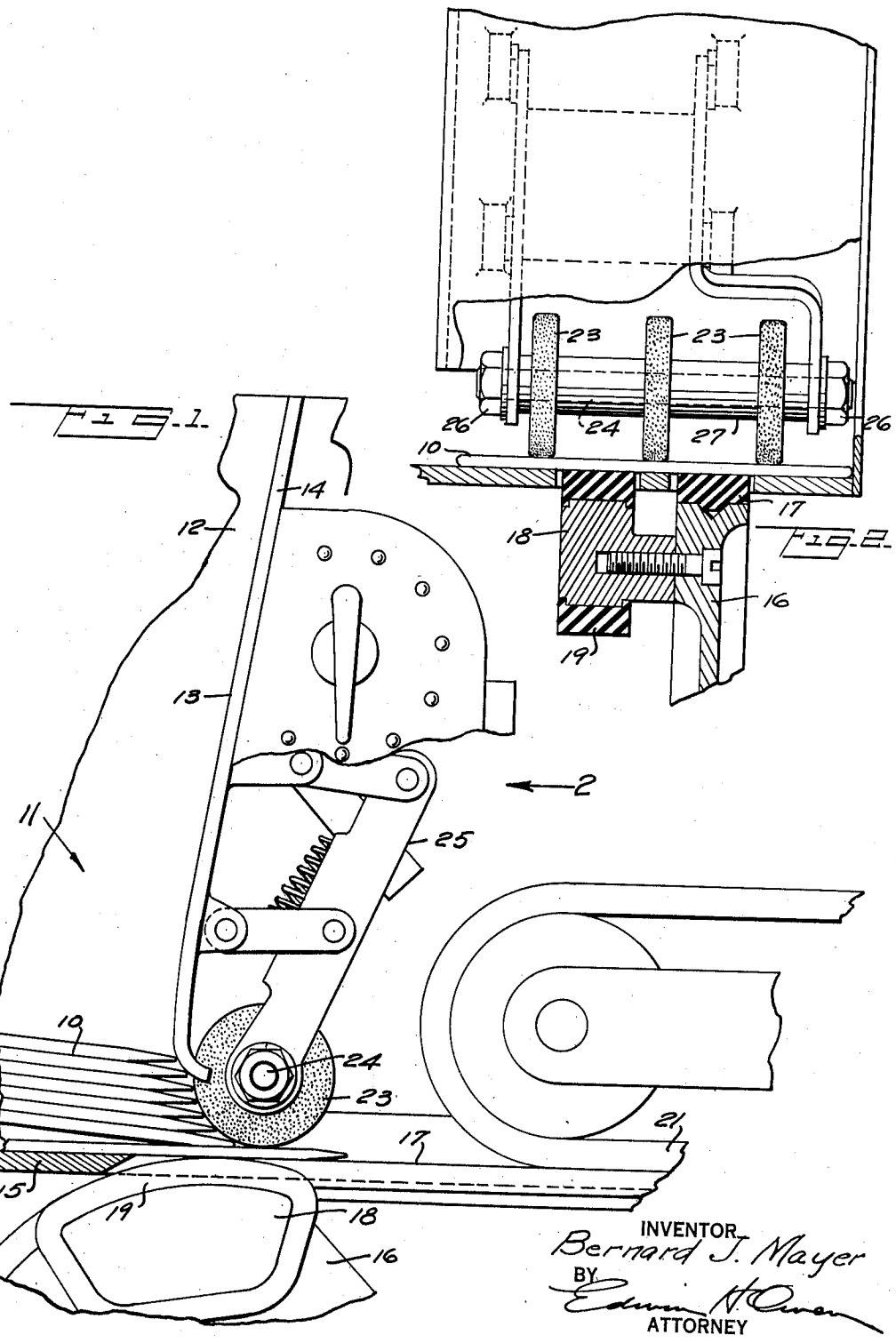
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LETTER STRIPPING DEVICE

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LETTER STRIPPING DEVICE

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This invention relates to a letter stripping and separating device such as used with letter cancelling and more particularly metered mailing machines.

The purpose of a letter stripping and separating device is to provide for the feed of each letter of a stack of letters past one or more operating positions for the moistening and sealing of the envelope flap, and the printing of a postage stamp impression, for example. Letters are ordinarily stacked in a hopper one above the other and stripper mechanism is adapted to intermittently engage and move the lowermost letter to letter feeding devices. To assure proper separation of the letters, that is, to strip or feed only one letter at a time, some form of frictional device is positioned in the path of the stripped letter, the purpose being to obstruct the passage of the letter or letters immediately adjacent the one which is being stripped.

Various frictional devices have been in use but none have been as efficient in operation as desired owing to the continual change in the friction devices resulting from wear. One common form of separator device includes the arrangement of rubber faced rollers directly in the path of the stripped letter and the mounting of same in a yieldable support. In some instances the rollers are reversely driven, and in other instances the rollers are stationary during letter stripping operations but adjustable slightly after each stripping operation. In each of said instances the purpose of the drive or adjustment was to effect an even distribution of the wear of the roller surfaces. Owing to the continuous frictional drag of the rollers against the surfaces of the letters as the said letters are moved therebeneath, the rollers are subjected to considerable wear, and when used under conditions where the daily mailings are voluminous, such as by direct mail advertising agencies and the like, the rollers must be changed at very frequent intervals. A change of rollers at two to three week intervals is a common occurrence with some mailers.

According to the present invention, means is provided whereby the wear resulting from frictional engagement between the letter surface and obstruction or separator means is for all practical purposes eliminated and the separation is improved.

It is the object of the present invention therefore, to provide in a letter stripping and separating device, obstruction means which is adapted to limit the stripping of letters to one letter at a time through the frictional contact of each letter therewith, and to further provide in said obstruction means an abrasive letter engaging surface the frictional or letter retarding characteristics of which will provide for the restricted stripping of letters without effecting wear of the obstruction means and in a manner which will improve separation.

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 drawing, wherein;

Fig. 1 is a side elevational view showing a letter separator unit with a letter stripper member in the act of stripping a letter from a stack of superimposed letters, and

Fig. 2 is a front elevational view of Fig. 1 looking in the direction of the arrow 2 of Fig. 1.

Referring to the drawing in detail, letters 10 are stacked in a hopper 11 with their top edges engaging a guide wall 12 and their forward side edges engaging a wall 13 which forms part of a separator support 14. A letter feed plate 15 supports said letters while in the hopper and when the individual letters are stripped and fed from the stack.

Below the letter feed plate 15 a stripper member is mounted, which preferably comprises the common form of bump feed structure and includes a driven pulley 16 having a feed belt 17 thereon, and further having a pad 18 with a frictional surfaced portion 19. The frictional portion 19 of said pad is adapted to engage the lowermost letter of the stack during each revolution of the pulley 16 to thereby strip said letter from the stack and direct same along the feed belt 17 until the letter is engaged between said belt 17 and a driven upper feed belt 21 or other suitable letter feed means.

The separator unit, which is employed to obstruct movement of those letters which lie immediately adjacent or above the letter which is being stripped, may be constructed in a manner illustrated and described in a co-pending application Serial No. 377,462, with the exception of the obstruction means. Said obstruction means comprises abrasive rollers 23 which are rigidly

mounted on a shaft 24 in any convenient manner, such is indicated in Fig. 2 for example. Here the rollers are shown as clamped to the shaft 24 by means of nuts 26, which are drawn up tight to clamp the rollers between spacing members 27. The shaft is mounted in a yieldable support 25 to permit letters of varying thickness to pass freely beneath the rollers 23. Various adjustments of the support are provided for varying the tension of the rollers 23, upon the letters passing therebeneath, in a manner fully described in said co-pending application.

The inherent characteristics, the effect or result accomplished by the abrasive rollers 23, when used in place of the rubber faced rollers in a unit of this type, forms the subject matter on which this invention is based. Such characteristics as the multiplicity of minute particles projecting beyond the periphery of the abrasive rollers, the hard crystal-like character thereof, as found in carborundum or similar grinding wheels, which are adapted to resist wear even when grinding hardened steel, presents to the art of letter separators a new and most beneficial approach. Abrasive surfaced rollers, because of being adapted to resist wear have been found to be admirably well suited for the work of separating letters in a device of the character described. Obviously, if an abrasive wheel will resist wear in the grinding of steel, the frictional contact of the letter passing by it will have no wearing effect upon an abrasive separator roller. Wear if any, occurs on the surface of the letters, but even this is so slight owing to the fact that but a very light tension is necessary between the roller and letter.

It will be noted from Fig. 1, that the leading edges of the first few letters come into direct contact with the abrasive surface of each roller. Here the roller serves another purpose in that the rough surface thereof has the effect of providing a pre-separation of the letters, that is, the edge of the letters in engaging the abrasive surface of the rollers do not have the tendency to creep downward along the surface of the rollers such as they do along the smooth surface of the rubber rollers.

As prevously stated, it is the custom to provide a reverse drive for rubber rollers to thereby distribute the wear. It is also necessary under such conditions to provide an adjustable guard between the rollers and the leading edges of the letters, whereby the rotation of the rollers when driven, will be prevented from contacting the letter edges and drive said letters away from the rollers. With the abrasive rollers the adjustable guard is not required.

It will be seen from the above therefore, that the use of obstruction means or rollers with abrasive surfaces is particularly suited for the purpose of letter separation in a letter stripping machine of the character described. It will be further seen that there is a considerable difference between the frictional rollers of the rubber variety and the abrasive rollers of the present invention, in that the former effects a rubbing contact across the whole surface of each roller and causes wear of the roller, while the abrasive rollers present a comparatively restricted surface to the letters, and owing to the hardness or diamond like quality of the projecting crystal-like surfaces of the abrasive rollers at the letter engaging surface, the wear of the projections through frictional engagement of the letters therewith is nil. With the structure of the minute abrasive projections, a pre-separation is also offered to the letters adjacent the one which is stripped, in that the edges of the letters engage the comparatively jagged surface of the abrasive. Further, whatever wear does occur is found to be only a slight scoring of the letter rather than the wear of the roller, but this scoring is so slight that it is not easily perceptible to the eye.

As a direct result of the lighter tension required for the abrasive type of roller in comparison with that required for the rubber rollers, the feeding of the mail is improved. The heavier frictional contact between the rubber rollers and the letters developes a tendency to skew occasional letters out of normal feeding alignment, especially where letters vary in thickness. When such skewing occurs it interferes with the proper moistening and sealing of flaps, also the location of the printed impression, and the final stacking of letters in a receiving hopper. Correct feeding of the letters, and particularly the correct starting of the feeding during the stripping operation, is necessary to obtain the desired flap moistening, sealing, printing and stacking operations, and such correct feeding is made possible by means of the abrasive rollers. The improved result obtained therefore, as referred to above, is attributed to the characteristic of the abrasive surface.

Having described the invention, what is claimed is:

1. In a letter stripping and separating device adapted to strip the end letter from a stack of superimposed letters, the combination with a frictional letter stripping member engageable with one surface of a letter positioned adjacent thereto when stripping same; of a letter separating device positioned in the path of the letters immediately adjacent said first named letter including means having an abrasive surface engageable with the other surface of the first named letter during stripping, said abrasive providing a frictional but non-wearable surface, whereby continuous letter stripping operations may result without periodic adjustment of the separating device.

2. In a letter stripping and separating device adapted to strip the end letter from a stack of superimposed letters, the combination with a frictional letter stripping member engageable with one surface of a letter positioned adjacent thereto when stripping same; of a letter separating device positioned in the path of the letters immediately adjacent said first named letter including rollers locked in a non-rotative position, each roller having an abrasive surface engageable with the other surface of the first named letter during stripping, said abrasive providing a frictional but non-wearable surface, whereby continuous letter stripping operations may result without periodic adjustment of the separating device.

3. In a letter stripping and separating device adapted to strip the end letter from a stack of superimposed letters, the combination with a frictional letter stripping member engageable with one surface of a letter positioned adjacent thereto when stripping same; of a letter separating device positioned in the path of the letters immediately adjacent said first named letter including means having an abrasive surface engageable with the other surface of the first named letter during stripping, whereby only the letter

adjacent the feed member is adapted to be stripped, said abrasive surface comprising a multiplicity of minute hard surfaced projections which expose a restricted and non-wearable frictional surface to the letters.

4. In a letter stripping and separating device adapted to strip the end letter from a stack of superimposed letters, the combination with a frictional letter stripping member engageable with one surface of a letter positioned adjacent thereto when stripping same; of a letter separating device positioned in the path of the letters immediately adjacent said first named letter including means having an abrasive surface engageable with the other surface of the first named letter during stripping, whereby only the letter adjacent the feed member is adapted to be stripped, said abrasive comprising a hard rough surface the rough edges of which effect a light frictional drag upon the letter sufficient to prevent the next adjacent letter from moving therebeneath and without effecting wear of the frictional surface.

5. In a letter stripping and separating device adapted to strip the end letter from a stack of superimposed letters, the combination with a frictional letter stripping member engageable with one surface of a letter positioned adjacent thereto, and letter separating means positioned in the path of the letters immediately adjacent said first named letter including means having an abrasive surface engageable with the other surface of the letter during stripping whereby only the letter adjacent the feed member is adapted to be stripped, and further engageable by the leading edges of the letters immediately adjacent the stripped letter to effect a pre-separation of the said letters.

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