Jan. 5, 1932. A. NOVICK 1,839,491

SCORING MECHANISM FOR ENVELOPE MACHINES AND THE LIKE

Original Filed Jan. 26, 1927 3 Sheets-Sheet 1

Fig. 2.

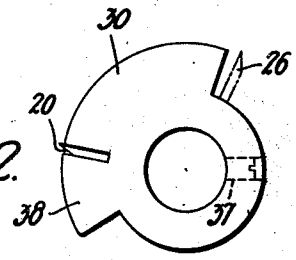


Fig. 3.

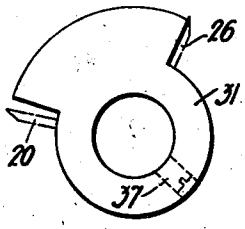


Fig. 1.

Fig. 4.

Fig. 5.

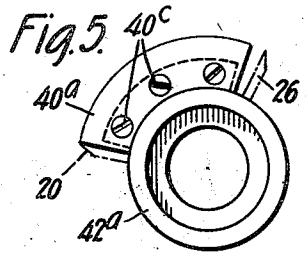
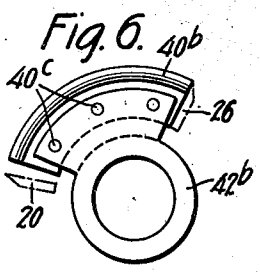


Fig. 6.



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Jan. 5, 1932. A. NOVICK 1,839,491

SCORING MECHANISM FOR ENVELOPE MACHINES AND THE LIKE

Original Filed Jan. 26, 1927 3 Sheets-Sheet 2

Fig. 7.

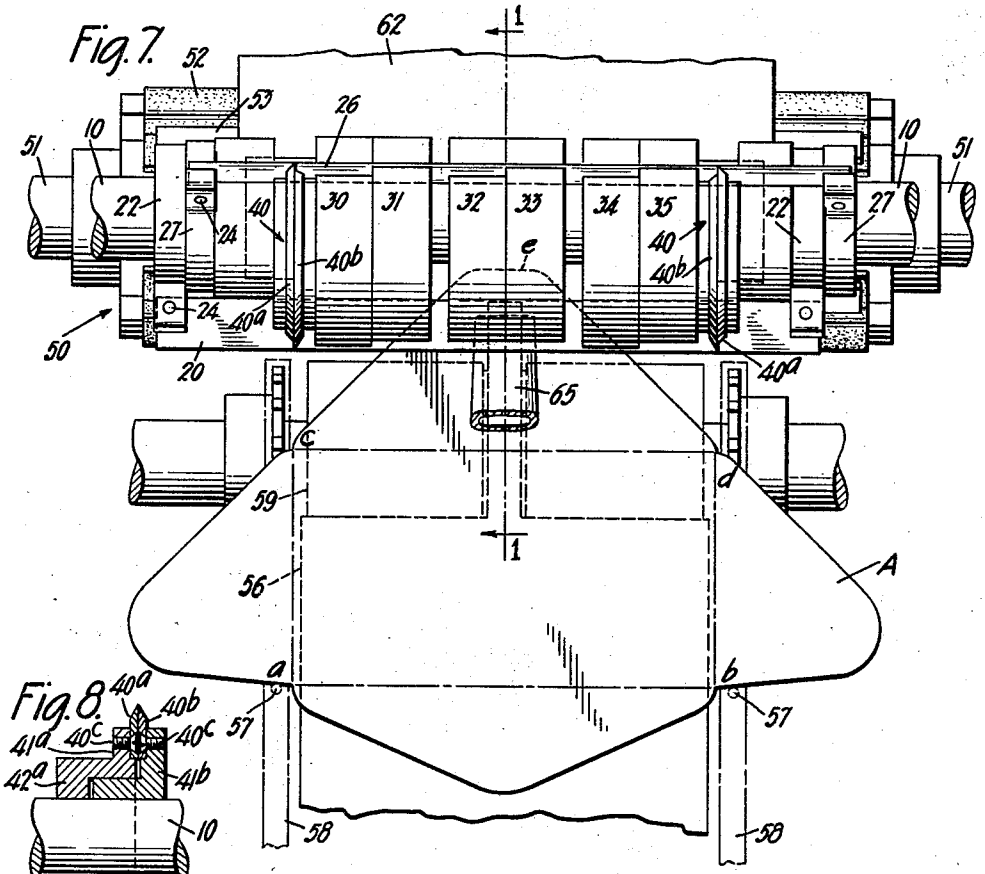


Fig. 8.

Fig. 9.

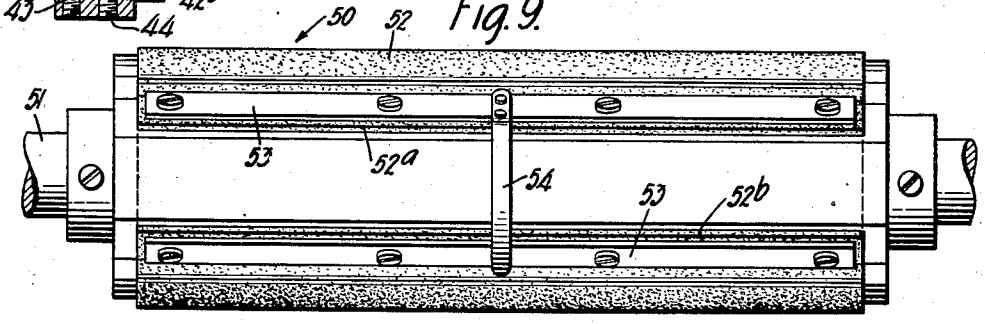


Fig. 10.

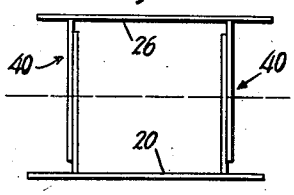
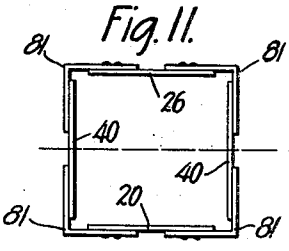


Fig. 11.



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Jan. 5, 1932. A. NOVICK 1,839,491

SCORING MECHANISM FOR ENVELOPE MACHINES AND THE LIKE

Original Filed Jan. 26, 1927 3 Sheets-Sheet 3

Fig. 12.

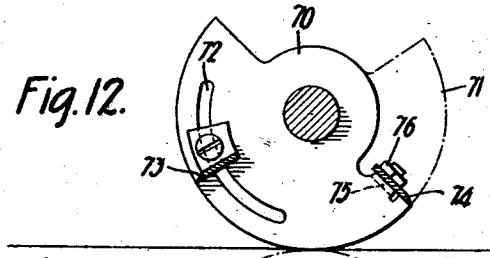
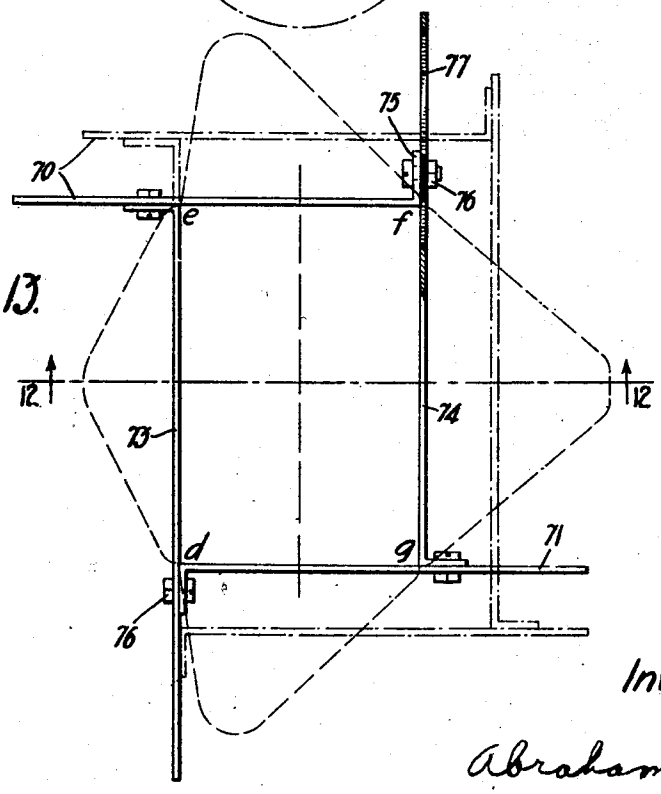


Fig. 13.



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Patented Jan. 5, 1932

1,839,491

UNITED STATES PATENT OFFICE

ABRAHAM NOVICK, OF FLUSHING, NEW YORK, ASSIGNOR TO F. L. SMITHE MACHINE CO., INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

SCORING MECHANISM FOR ENVELOPE MACHINES AND THE LIKE

Application filed January 26, 1927, Serial No. 163,612. Renewed September 26, 1931.

My present invention pertains to envelope making machinery and more particularly it relates to improved mechanism for scoring the envelope blanks preparatory to folding the same into the finished envelope.

The invention will be best understood by reference to the following detailed description taken with the annexed drawings forming part of the specification, in which:

Fig. 1 is a view in side elevation of a section of an illustrated embodiment of the invention, such section being indicated by line 1—1 in Fig. 7;

Figs. 2 and 3 are details of the sector elements composing the feed portion of the upper scoring roll;

Fig. 4 is a detail view showing the means for securing the transverse scoring blades forming a part of the said roll;

Figs. 5 and 6 are detail views of the sections composing one of the circumferential scoring blades;

Fig. 7 is a plan view of the machine with the standards holding the upper roll removed;

Fig. 8 is a detail view of a section through a circumferential scoring blade;

Fig. 9 is a view of the female scoring roll;

Fig. 10 is a diagram showing a plane development of the scoring blades;

Fig. 11 is a similar diagram of a modification; and

Figs. 12 and 13 are sectional side and plane developed views respectively of a modified arrangement of the scoring blades, part of Fig. 13 also being shown in section.

Referring now to the drawings by characters of reference, 10 denotes the shaft of the upper or male scoring roll denoted generally by 11, secured in suitable bearings 12 within the standards 13. It will be evident from Fig. 1 that the roll 11 is pressed against the lower roll by means of a spring 15 the tension of which may be adjusted by means of a nut 16 as is well understood. Said nut is also effective to adjust the position of the scoring roll 11. This action of spring 15 and nut 16 will be apparent from inspection of Figure 1 wherein the threaded shaft to which said nut is secured passes freely through the cross-piece supported by the standards 13 and is connected at its lower end to the bearing 12. Thus tightening nut 16 will raise bearing 12 against the tension of the spring 15, said bearing being free at all times to move upwardly against said tension. It will be understood that the construction involving nut 16 is one of a plurality at separated points across the machine. It will be convenient now to describe the upper or male scoring roll in detail.

Referring first to Fig. 7, an envelope blank A is there shown with the score lines indicated by *a*—*b*, *c*—*d*, *a*—*c*, and *b*—*d*. The rectangle formed by these score lines corresponds with that formed by the development of the scoring blades as shown in Fig. 10, for example. The problem which is presented, is to mount the scoring blades in the roll so that the size of the rectangle may be varied for different sized blanks. Furthermore, the scoring roller must also serve to feed the blanks as well as to score them and to provide means for limiting the descent of the scoring knives into blank or female roller. To this end, as well as for the purpose of supporting the transverse scoring blades, I preferably mount these blades in suitable collars, preferably adjacent each end of the roll, and provide a plurality of feeding and blade supporting sections of sector shape and occupying the angular space between the transverse blades. Preferably alternate sections abut either blade, such alternate sections being angularly movable with respect to one another, thus enabling the angular distance separating blades to be varied at will. In addition, I preferably provide at least two of the sectors supporting and abutting the first scoring blade with a lip or portion extending in advance of the blade, to form a feeding sector for the portion of the blank in advance of the first score line.

In accordance with the foregoing the blade 20 making the first transverse score line, is attached to shaft 10 by means of collars 22 provided with lugs 23 adapted to receive the blade 20. Screws 24 secure the blade in place—see Figures 7 and 4. Similarly, scoring blade 26 is mounted at an angular dis-

tance behind blade 20, by means of collars 27. Set screws 28 (Figure 4) secure the collars to the shaft. Also mounted on shaft 10 and between the circumferential scoring blades (to be dealt with later,) I preferably provide pairs of feeding and supporting members denoted respectively by 30—31, 32—33, 34—35. In the embodiment shown, the even numbered sectors abut against or, rather contain blade 20, while the odd numbered sectors abut against blade 26—see Figures 7, and 2 and 3. Set screws 37 secure the sectors to the shaft, as shown. In the case of the even numbered sectors, for example, I may provide these with a portion 38 extending to some angular distance in advance of the blade for the purpose of feeding the advancing end *e* (Fig. 2) of the blank beneath the scoring blades. It will be apparent from the foregoing that the transverse scoring blades 20 and 26 are circumferentially separable from one another, and that adjustment movement of the advancing blade 20 for example, will be accompanied by the feeding and supporting members 30, 32, 34, the sectors 31, 33 and 35 continuing to abut the blade 26. In this manner the blades are adequately supported for any adjusted position.

Having described the manner of attaching the transverse scoring blades, the circumferential blades 40 making the longitudinal scoring may now be considered. Referring to Figures 7, and 5 and 6, such blades are preferably made in sections 40*a* and 40*b*—Figures 5, 6 and 8, formed with their contacting surfaces plane, while their outer surfaces are beveled, as shown in Figures 6 and 8. Each blade section 40*a* and 40*b* is attached by means of lugs 41*a* and 41*b* respectively to collars 42*a* and 42*b*. Preferably, as shown best in Figure 8, the collar 42*b* fits within collar 42*a*, which latter is affixed to shaft 10 by a set screw 43 and to collar 42*b* by set screw 44. The knife sections 40*a* and 40*b* are secured to their respective collars by means of screws 40*c* in the corresponding lugs, as best shown in Figures 5, 6 and 8. In this manner the effective scoring arc of each circumferential blade is varied by turning one knife section with respect to the other while the composite blades 40 may be separated from one another along shaft 10 by means of the single set screws 43. Furthermore, as indicated in Figures 5 and 6, the ends of the circumferential blades abut the respective transverse blades 20 and 26 so that a plane development of the scoring surface results in the rectangle shown in Figure 10. Thus, the construction thus far described, permits of adjustment of the scoring blades in two directions so as to fit a given size of envelope blank.

Referring now to the under, or female, scoring roll 50, this is mounted on a shaft 51 and is provided on its bearing surface with a layer 52 of resilient material, such as rubber. The non-bearing surface is preferably provided with longitudinal recesses or cutout portions for the purpose of receiving the ends 52*a* and 52*b* of the rubber 52. Bands 53—53 are preferably screwed to the roller 50 at frequent intervals, as shown in Figure 9, for securing the ends 52*a* and 52*b* to the roller so that the layer 52 of resilient material may readily be replaced. Also attached to one of said bands is a circumferentially extending prong 54 which is loose at one end, and which serves to prevent the blank from entering the recesses in the roller 50 and guide the blank over a table 63.

The blanks are fed to the scoring rolls on a table 56 by means of lugs 57 attached to chain belts 58 passing around roller 59, suitable mechanism being provided to feed the blanks in timed relation with the scoring rollers. For driving the mechanism shown a belt or chain driven shaft 60 is geared to shaft 51, which in turn is geared to shaft 10, the gears being shown in the dot-and-dash lines in Figure 1. In order that the first transverse crease line may be accurately gauged for different sized blanks, I preferably make the shaft 10 of upper roll 11 adjustable with respect to its driving gear mounted thereon, whereby shaft 10 may be turned a slight amount while said gear is held stationary.

Rearward of the scoring rolls I preferably provide a guide 62 above the table 63, which is a continuation of a table 56. The blanks pass beneath the guide 62. To insure that this action takes place, I have provided a nozzle 65 mounted so as to direct a stream of air between the scoring rolls and preventing the blank from curling upward so as to avoid the guide 62.

As shown in the construction thus far described, the transverse blades extend beyond the circumferential blades, as shown in Figure 10. If desired, however, the transverse blades may terminate at the intersection with the circumferential blades and be made extensible in analogous manner to the circumferential blade, all as shown in Figure 11. In the illustrated form of construction there are provided four rectangular scoring blades 81, and the length of transverse score is regulated by the adjustable blades 20 and 26, whereas the length of longitudinal score is regulated by blades 40.

In Figures 12 and 13, I have shown a further modification of the arrangement of the scoring blades. As there shown, I provide a pair of circular blades 70, 71 of sufficient circumferential length to make the longest side flap scoring line, for which the apparatus is to be designed. By means of a circumferential slot 72 in circumferential blade 70, for example, I secure thereto, a transverse blade of L shape 73, extending the length of the longest score line desired. As shown in

Figure 12 the circumferential blades 70, 71 are made in the form of sectors, one end of which is adapted to receive the body of a transverse blade (73 or 74) by means of a lip 75 at right angles to the plane of the circumferential blade. This lip 75 of blade 70 retains the body of blade 74 by means of a set screw and nut combination 76 which operates in a slot 77 in said blade. The same construction obtains in case of blade 71. It will be seen from the foregoing that on plane development, the blades 70, 71, 73 and 74 form a rectangle in which each blade is joined in succession to a blade at right angles to it and is extensibly secured along the length thereof, advantage being taken of the fact that the corners of the rectangle formed by the score lines occur on the perimeter of the blank, whereby it is possible to have both longitudinal and transverse scoring blades extend beyond the corners of the rectangle. By referring to Figure 13 which is a plane development of the scoring knives it will be seen that a rectangle *e d f g* is formed which may be enlarged to any size within the limit of adjustment provided.

From the foregoing it will be apparent that I have provided an improved scoring roll in which the scoring blades may be readily and quickly adjusted to any size envelope. Furthermore, by the means shown, the blanks passing through the rolls are prevented from curling upward, due to the scoring action.

What I claim is:

1. A scoring roll for an envelope making machine and the like, having a pair of transverse scoring blades angularly adjustable with respect to one another, and a pair of circumferential, angularly extensible scoring blades such that upon plane development, said blades include a rectangle.

2. A scoring roll for an envelope making machine and the like, having a pair of transverse scoring blades angularly adjustable with respect to one another, collars spaced along said shaft and securing said blades thereto and a plurality of feeding sectors between and along the length of said blades, certain sectors abutting either blade and angularly adjustable therewith.

3. A scoring roll for an envelope making machine and the like, having a pair of transverse scoring blades angularly adjustable with respect to one another, collars spaced along said shaft and securing said blades thereto, a plurality of feeding sectors between and along the length of said blades, certain sectors abutting either blade and angularly adjustable therewith, and certain sectors having a feeding portion in advance of the blade making the first transverse score line.

4. A scoring roll for an envelope making machine and the like, having a pair of transverse scoring blades angularly adjustable with respect to one another, a pair of circumferential, angularly extensible scoring blades such that upon plane development, said blades include a rectangle, and a plurality of feeding sectors between said transverse blades and said circumferential blades.

5. A scoring roll for an envelope making machine and the like, having a pair of transverse scoring blades angularly adjustable with respect to one another, a pair of circumferential, angularly extensible scoring blades such that upon plane development, said blades include a rectangle, and a plurality of feeding sectors between said transverse blades and said circumferential blades, certain of said sectors abutting either transverse blade and angularly adjustable therewith.

6. In combination, a pair of scoring rolls comprising an upper scoring roll, a lower roll in contact therewith having the portion of its surface which contacts with the blades of the scoring roll of soft, resilient material, the remaining portion being cut away and provided with a circumferentially extending spring member.

7. In combination, a pair of scoring rolls comprising an upper scoring roll, a lower roll in contact therewith and an air nozzle in advance of the bite of said rolls disposed so as to direct a stream of air tending to prevent the blanks from curling upward after passing through the rolls.

8. A scoring roll for an envelope making machine or the like, having a pair of transverse scoring blades, a pair of circumferential scoring blades, means for securing said transverse blades in adjustable angular relation to one another whereby upon plane development, said blades include a rectangle in any adjusted position.

9. A scoring roll for an envelope machine or the like, having a pair of transverse scoring blades, a pair of circumferential scoring blades of sector shape, means for securing said transverse blades in adjustable angular relation to one another, said transverse blades being arranged to permit of varying the distance apart of said circumferential blades, whereby upon plane development said blades include a rectangle in any adjusted position.

10. In a scoring roll for envelope making machines and the like, a pair of transverse scoring blades, a pair of circumferential scoring blades, said scoring blades mentioned upon plane development forming a rectangle, the corners of which occur on the periphery of the blank to be scored, and means for varying both the length and width of the rectangle included by said blades upon plane development.

11. A scoring roll for a machine for making envelopes and the like, comprising a shaft, a pair of angularly separated transverse scoring blades, means for mounting

same on said shaft permitting angular adjustment of said blades with respect to one another, a pair of circumferential blades, a mounting securing same to the shaft, said circumferential blades abutting one of said transverse blades and extending beyond said other transverse blade.

12. A scoring roll for a machine for making envelopes and the like, comprising a shaft, a pair of angularly separated transverse scoring blades, means for mounting same on said shaft permitting angular adjustment of said blades with respect to one another, a pair of circumferential blades, a mounting securing same to the shaft, said circumferential blades abutting one of said transverse blades and extending beyond said other transverse blade, said circumferential blades being adjustable along said shaft.

13. A scoring roll in accordance with claim 11, in which the mounting for one of said transverse blades comprises a collar and means for adjustably holding same on said shaft.

14. A scoring roll for an envelope machine or the like, having a pair of transverse scoring blades and a pair of circumferential scoring blades of sector shape, means for holding one of said transverse blades adjustably with respect to its length, and means for holding the other of said transverse blades in adjustable angular position with respect to said circumferential blades, said blades being so disposed with respect to one another as to include a rectangle in any adjusted position.

In testimony whereof I have affixed my signature to this specification.

ABRAHAM NOVICK.