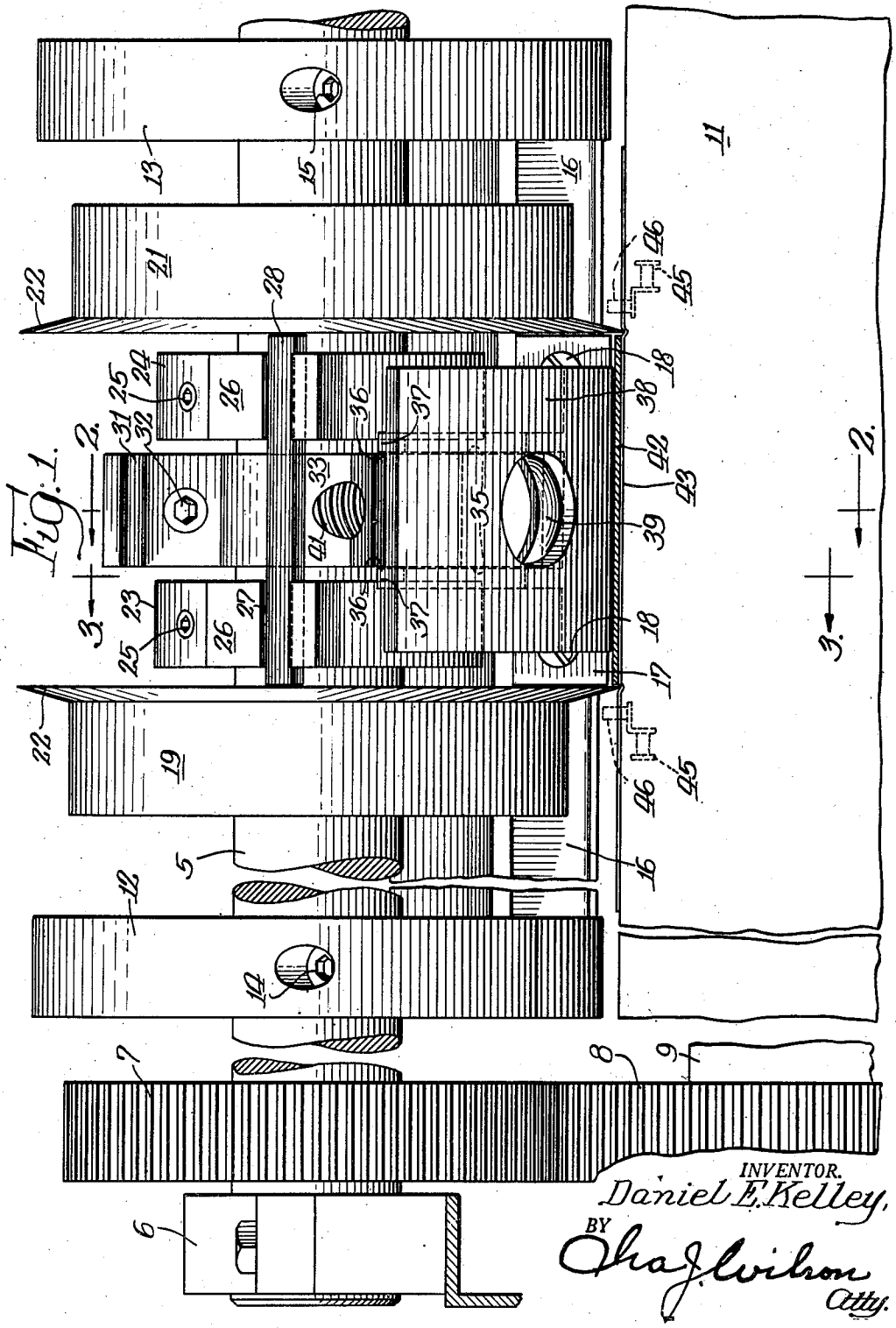
July 2, 1946. D. E. KELLEY 2,403,377

SCORING ROLL

Filed Sept. 4, 1944 2 Sheets-Sheet 1



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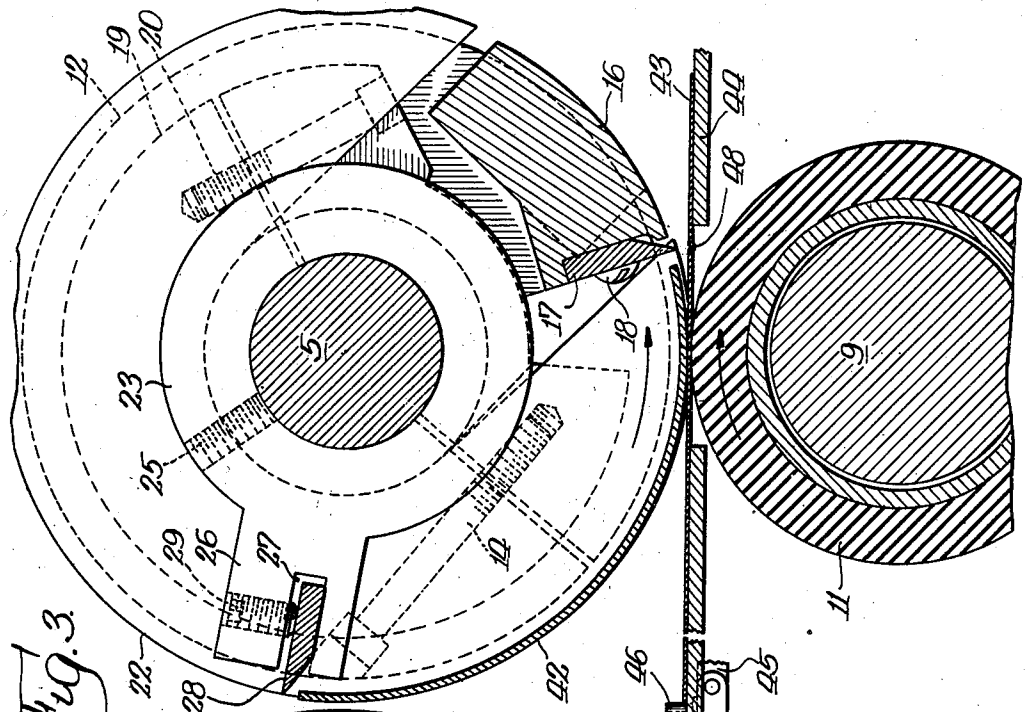


Fig. 3.

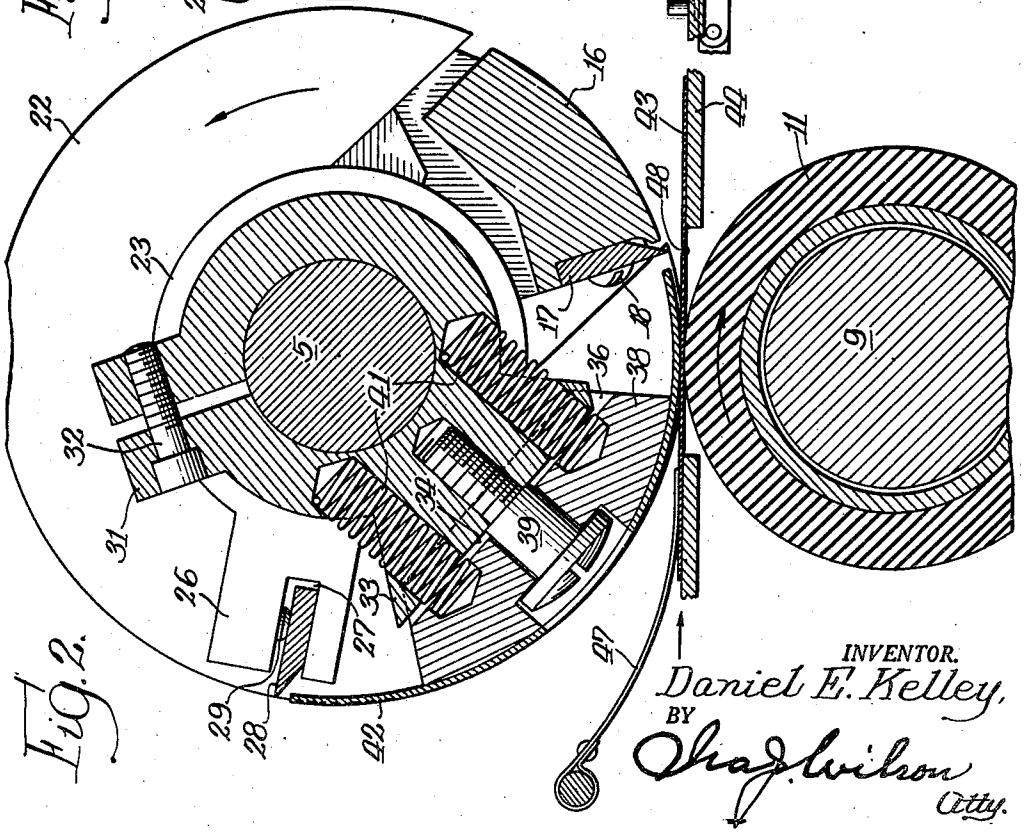


Fig. 2.

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SCORING ROLL

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8 Claims. (Cl. 93—58.1)

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This invention relates in general to the envelope making art and more specifically to the scoring of envelope blanks made of paper or other suitable fibrous material.

As these blanks are fed in succession to an envelope folding mechanism, it is essential that they be scored along definite lines to facilitate the operation of the flap folding mechanisms and to produce a finished envelope which will be flat and of minimum thickness around the margins and of predetermined size.

The score mechanism to which my invention relates comprises a scoring roll and includes a pair of side scoring discs spaced apart longitudinally of the roll, arranged concentrically of the roll and adapted to form the side scores defining the side edges of the envelope. It also includes top and bottom score blades spaced apart circumferentially of the roll to effect the scoring along lines which will constitute the upper and lower edges respectively of the completed envelope. A floating block is mounted on the roll within the space bounded by the score blades and discs and upon the face of this plate is mounted an arcuate plate extending substantially to the score blades and discs. The size of the plate is determined in each instance by the spacing between the scoring discs and the spacing between the scoring blades. The function of this plate is to hold the envelope blank flat and feed the blank along with the rotation of the roll.

Due to the construction of the scoring rolls employed prior to my invention, the size of the envelope which could be scored with this type of device was definitely limited. While considerable opportunity for variation in length of the envelope from end to end was afforded, the height of the envelope, i. e., the measurement from the upper edge, constituting the base of the closure flap, to the opposite edge, was limited by two factors, namely the permissible spacing between the upper and lower score blades and the circumferential length of the side scoring discs.

One of the purposes of my present invention is to provide a scoring roll which will be capable of use in the production of envelopes of considerably larger dimensions than has heretofore been possible with this type of mechanism. In order to accomplish this result, both the upper and lower scoring blades are adjustably mounted on the supporting shaft so that the circumferential space between them determining the height of the envelope may be varied anywhere between substantially thirty and three hundred

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degrees. In this connection it should be noted that the scoring discs which produce the score lines in the sides or ends of the envelope are provided with scoring edges throughout a portion of their perimeter which corresponds with the maximum separation in adjusted position of the upper and lower blades.

Another feature of my present invention resides in the construction and mounting of the presser plate carrying block which yieldingly urges the presser plate against the opposing roll so as to insure the feeding of the stock between the rolls. This block, according to my invention, is so mounted that side play or turning or twisting movement of the plate such as would result in improper feeding of the blanks, is prevented.

Another purpose of the invention is to provide a roll of the character indicated which will be strong and durable, one in which the parts are accessible for adjustment purposes, and one which will be reliable in operation and not apt to get out of adjustment or out of order in use.

Other objects of the invention and many of the inherent advantages will be readily appreciated as the same becomes better understood by reference to the following description when considered in connection with the accompanying drawings.

Referring to the drawings,

Fig. 1 is a front elevation of a portion of an envelope machine equipped with a scoring roll constructed in accordance with my invention;

Fig. 2 is a transverse sectional view on the line 2—2 of Fig. 1; and

Fig. 3 is a similar view on the line 3—3 of Fig. 1.

On the drawings reference character 5 indicates the shaft of the scoring roll upon which the various parts constituting my invention are mounted. The shaft is journaled in suitable bearings, one of which is indicated by reference character 6 and is driven by a gear 7 which meshes with a companion gear 8 fixed on the shaft 9 of a rubber covered feed roll 11 and in turn driven from any suitable source of power.

A pair of split clamping collars 12 and 13 are adjustably mounted on the shaft 5 in spaced apart relation and clamped to the shaft by clamping bolts 14 and 15 respectively. A bar 16 fixed at its ends to the collars 12 and 13 is adapted to carry the lower score blade 17 which is secured to the outer face of the bar by screws 18. This score blade is the one that produces the first score line across the envelope blank as the blank is fed through the machine. This line along which

a projecting flap is folded usually forms the bottom edge of the envelope and therefore this blade is customarily referred to as the bottom blade.

Split collars designated 19 and 21, respectively, are mounted upon the shaft 5 in spaced apart relation. One or both of these collars may be adjusted longitudinally of the shaft to vary the distance between them in accordance with the width of the envelope to be formed by loosening its clamping bolt 20. Each collar has a disc-shaped score blade 22 mounted on one face thereof with its tapered margin projecting outwardly from the collar in position to engage the envelope blank passing between these blades and the rubber covered feed roll 11 to thereby form two scores in spaced relation on the blank and extending in the direction of travel of the blank. These score lines determine the side edges of the envelope, since the side flaps or end flaps, depending upon the shape of the envelope, are folded inwardly on these lines. Each score disc 22 is provided, as best shown in Fig. 3, with a radial slot of sufficient width to receive the shaft 5 so that the disc may be slipped over the shaft and secured by screws or the like to the face of its collar 19 or 21, as the case may be.

Between the collars 19 and 21 collars 23 and 24 are adjustably mounted on the shaft by set screws 25 or the like. Each collar is shaped to provide a radial extension 26 transversely slotted as at 27 to receive the upper score blade 28 which is adjustably held in position therein by set screws 29.

Between the collars 23 and 24 another collar 31 is adjustably mounted upon the shaft 5 and clamped in adjusted position by a bolt 32 passing through one and threadedly engaged in the other of a pair of opposed lugs formed on the collar. The collar 31 is shaped to provide at one side an extension 33 terminating in a flat face 34. The sides 35 of the extension are parallel and serve as guides for the opposed faces 36 formed on parallel ribs 37 projecting inwardly from a presser plate carrying block 38. This block is secured to the extension 33 by a bolt 39 passing through the block and threaded into the extension. A pair of springs 41 seated in opposed sockets formed in the collar 31 and the block 38, respectively, bias the block radially outwardly from the shaft 5 and yieldingly retain it in the projected position shown in Fig. 2. A presser plate 42 of arcuate shape corresponding with the curvature of the perimeters of the side score blades 22 is mounted on the block 38 by means of screws or other suitable fastening means. The plate 42, which is replaceable, is designed to substantially cover the space bounded by the side score blades 22 and the upper and lower score blades 28 and 17, respectively. The function of the plate 42 is to cooperate with the rubber covered roll 11 in feeding the envelope blanks past the scoring roll. The blanks, indicated by reference character 43, are fed along the top of the table 44 by a chain conveyor 45 provided at spaced intervals with upstanding feed dogs 46. A plurality of depressers, which may be of leaf spring formation, indicated by reference character 47 hold the blanks down against the table top so that they will enter between the feed roll 11 and the scoring roll. The rotation of the scoring roll is so timed with respect to the feed chain 45 that at a predetermined point on the blank it is engaged by the lower score blade as it passes the feed roll 11, thereby producing the bottom score line indicated by 48 in Fig. 2.

As the blank travels between the rolls, the disc score blades 22 engage the blank and form the side score lines for the envelope, and as the top score blade 28 passes the feed roll it forms the top score line of the envelope.

During the progress of the blank between the rolls it is yieldingly held against the surface of the feed roll 11 by the plate 42 which is biased toward the feed roll by the springs 41. Any slippage between the blank and the scoring roll will cause the top score line to be formed in a wrong position on the blank, and any deviation from a straight line movement of the blank through the rolls will cause the side score lines produced by the circular blades 22 to be disposed obliquely instead of perpendicular to the top and bottom score lines. Any of these deviations will result in defective envelopes.

It will be observed that the pressure exerted by the springs 41 urges the plate 42 toward the roll 11 with sufficient force to prevent slippage of the blank and insure a positive feed through the rolls. Furthermore, the close fit between the surfaces 35 on the projection 33 and the opposed surfaces 36 on the guide ribs 37 of the block 38 prevent twisting of the block or displacement in any direction which might cause improper feeding of the blanks by the plate 42.

The adjustability of the lower score blade 17 circumferentially of the shaft, as well as a similar adjustability of the top score blade 28, provides for a wide degree of adjustability in the spacing between the upper and lower scoring blades, so that envelopes of widely differing height may be scored with this apparatus. Likewise, the construction is such that the circumferential length of the side score blades 22 may be as great as the maximum distance between the top and bottom score blades, thereby accommodating the machine as to all of its score line producing devices to envelopes of large as well as small sizes.

It is believed that my invention will be appreciated from the foregoing, as will also the fact that various deviations in the structural details from those illustrated and described may be resorted to without exceeding the scope of my invention as defined in the following claims.

I claim:

1. In a scoring roll, the combination of a rotatable shaft, a pair of collars adjustably mounted thereon, a bar connecting said collars, a lower score blade mounted on said bar, a pair of circular disc-like score blades mounted in spaced apart relation to rotate concentrically with said shaft, a pair of collars adjustably mounted on the shaft between said circular score blades, a top score blade carried by said last mentioned collars, a block yieldingly mounted for movement radially of the shaft but restricted against movement longitudinally of said shaft, and a curved plate of substantially the area enclosed by said score blades mounted on said block.

2. In a scoring roll, the combination of a rotatable shaft, side score disc blades mounted on said shaft in spaced apart relation, top and bottom score blades adjustably mounted on said shaft, a collar mounted on said shaft, a block yieldably mounted on said collar, and a presser plate carried by said block.

3. In a scoring roll, the combination of a shaft, top and bottom score blades adjustably mounted on said shaft, an arcuate presser plate disposed between said score blades, a block upon which said plate is mounted, a collar adjustably mounted on the shaft and provided with an extension,

means for securing said block to said extension, spring means yieldingly urging said block radially outwardly from the shaft, and cooperative abutting surfaces on said block and extension whereby said block is held against twisting movement relatively to the shaft.

4. In a scoring roll, the combination of a shaft, upper and lower score blades adjustably mounted thereon, disc shaped side score blades mounted on the shaft in spaced apart relation, a collar adjustably mounted upon the shaft between the mountings for said blades, said collar being provided with a radial extension having lateral guiding surfaces disposed in planes perpendicular to the axis of said shaft, a block having cooperating parallel guide surfaces arranged to engage the guide surfaces of the projection to hold the block against twisting movement, springs interposed between said block and said collar, means for mounting said block on the extension and limiting the movement of the block under the influence of said springs, and a curved presser plate carried by said block.

5. In a scoring roll, the combination of a shaft, a pair of disc-shaped side scoring blades mounted on said shaft in spaced apart relation, an upper score blade and a lower score blade adjustably mounted on said shaft, a presser plate disposed in the space bounded by said blades, means for adjustably mounting said plate on said shaft, means for yieldingly urging said plate away from the shaft, and means for preventing twisting movement of the plate relatively to the shaft.

6. In a scoring roll, the combination of a shaft,

a split collar adjustably mounted thereon and provided with a radial extension having parallel surfaces disposed in planes perpendicular to the axis of the shaft, a block having cooperative parallel surfaces, means for mounting said block on said extension with the surfaces of the block and extension cooperatively disposed to prevent twisting movement of the block, springs interposed between said block and said collar whereby the block is biased outwardly away from said shaft and scoring blades carried by said shaft and positioned to surround the exposed area of said block.

7. In a scoring roll, the combination of a shaft, a pair of collars adjustably mounted on said shaft in spaced apart relation, a bar connecting said collars, a lower score blade mounted on said bar, a second pair of collars adjustably mounted on the shaft, an upper score blade carried by said second pair of collars, a presser plate disposed between said score blades, a collar adjustably mounted upon the shaft and upon which said plate is mounted, means for yieldingly urging said plate radially away from the axis of the shaft, and means preventing twisting movement of the plate relatively to the shaft.

8. In a scoring roll, the combination of a rotatable shaft, side score disc blades mounted on said shaft in spaced apart relation, top and bottom score blades adjustably mounted on said shaft, a collar mounted on said shaft, and a presser plate yieldably supported on said collar within the confines of said blades.

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