June 17, 1941. D. F. NEWMAN 2,246,412

MECHANISM FOR ATTACHING WEBS TOGETHER

Filed Aug. 19, 1938 2 Sheets-Sheet 1

Fig. 2.

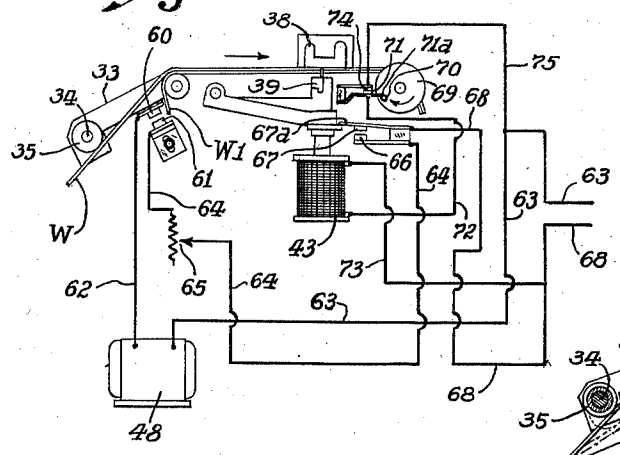
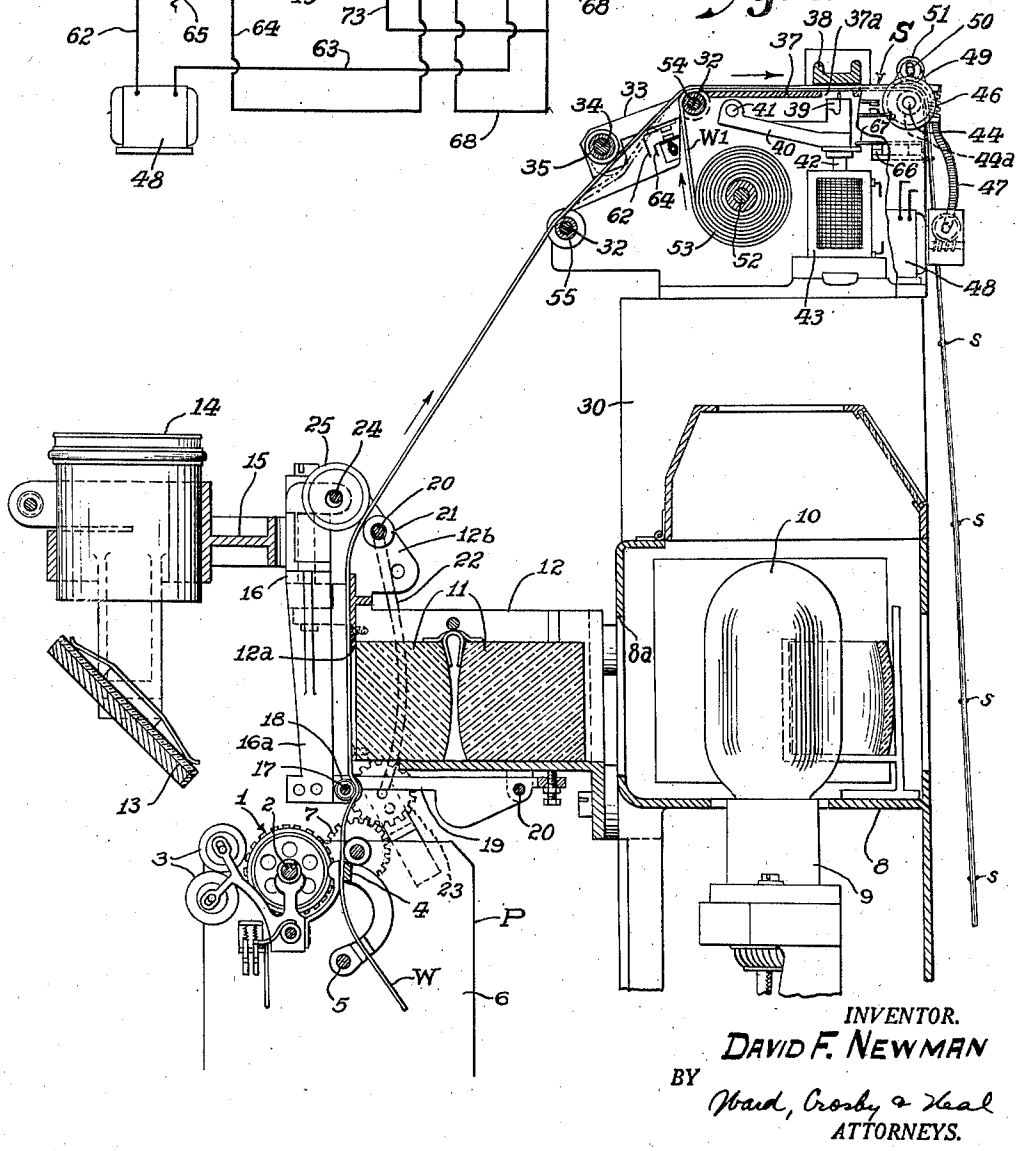


Fig. 1.



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Fig. 3.

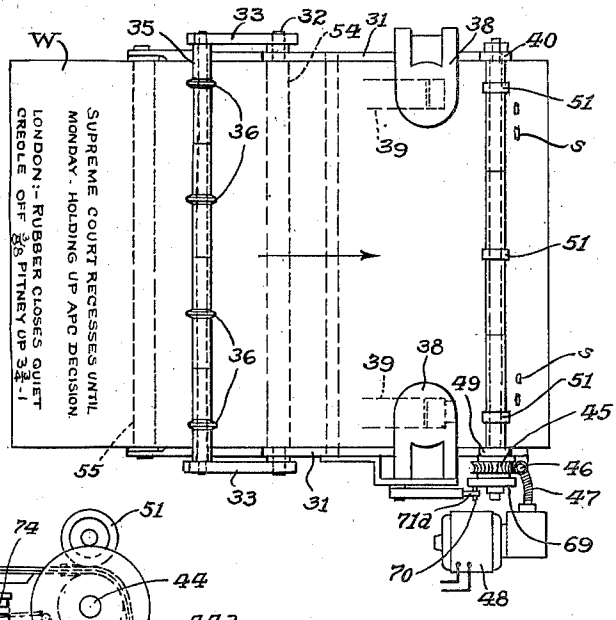


Fig. 7.

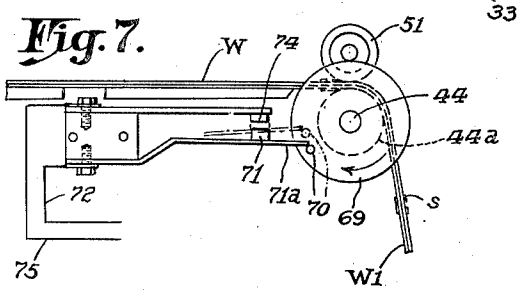


Fig. 8.

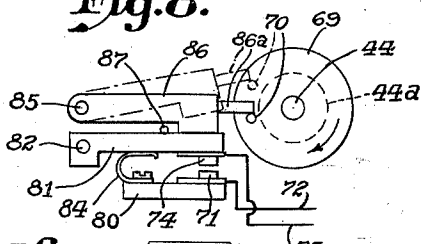


Fig. 9.

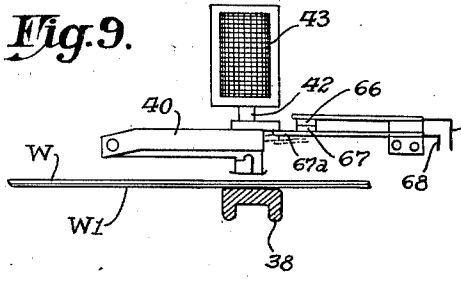


Fig. 6.

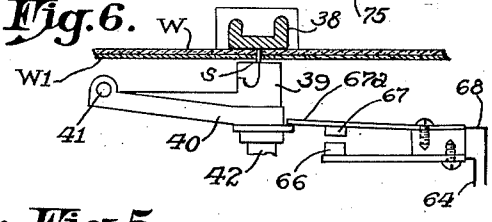


Fig. 4.

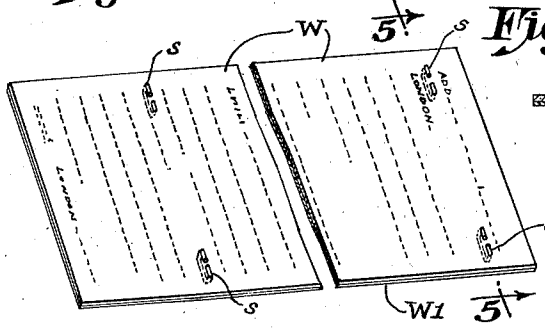
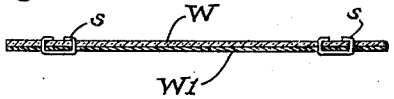


Fig. 5.



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UNITED STATES PATENT OFFICE

2,246,412

MECHANISM FOR ATTACHING WEBS TOGETHER

David F. Newman, Rockville Centre, N. Y., assignor to Trans-Lux Corporation, New York, N. Y., a corporation of Delaware

Application August 19, 1938, Serial No. 225,676

6 Claims. (Cl. 88—24)

My invention relates to mechanism for attaching a plurality of webs together while maintained in face-to-face relation.

In accordance with my invention, a plurality of face-to-face webs are moved along a path and, preferably by mechanism automatically operable, said webs are secured or attached together so that one web forms a backing for the other web.

Further, my invention relates to novel mechanism for attaching an opaque backing to a transparent or translucent web so that characters printed on the last named web may readily be distinguished.

Further objects, advantages and features of my invention will become apparent from the following description.

My invention resides in the novel mechanism, features and combinations of the character hereafter described and claimed.

For an understanding of my invention and for an illustration of some of the many forms thereof, reference is to be had to the accompanying drawings, in which:

Figure 1 is a vertical sectional view, partly in elevation, showing a form of my invention;

Fig. 2 is a diagrammatic view showing an electrical circuit arrangement;

Fig. 3 is a plan view showing a part of the apparatus illustrated in Fig. 1;

Fig. 4 is a perspective view illustrating the stapled webs of my invention;

Fig. 5 is a transverse sectional view taken on the line 5—5 of Fig. 4 looking in the direction of the arrows;

Fig. 6 is a fragmentary vertical sectional view, partly in elevation, showing the stapling mechanism of my invention;

Fig. 7 is an enlarged elevational view showing a feature of the invention; and

Figs. 8 and 9 are elevational views illustrating modifications of the invention.

Referring to Fig. 1, I have illustrated a combined printer-projecting system which may be of any suitable character as well known in the art. For purposes of explanation of the invention, the printer-projecting system herein illustrated is of the character disclosed in Weller application Serial No. 636,490, filed October 6, 1932, which has become Patent No. 2,128,867, dated August 30, 1938. As herein generally shown, although not necessarily, the printer P is of the character known to the art as a Dow-Jones printer and, hence, comprises a printing wheel 1 rotatable and movable longitudinally of a shaft 2, the printing wheel 1 receiving ink from a suitable inking arrangement 3. Coactable with the printing wheel 1 is a platen 4 pivoted on a rod 5 supported in the printer frame structure 6. The web W, of suitable transparent or semi-transparent material, is stored in roll formation upon a suitable reel, not shown, said web W extending upwardly along a path between the platen 4 and the printing wheel 1. As well understood in the art, a printer P of the type referred to comprises means automatically operable to feed the web W a line space at the conclusion of each line-printing operation. As the invention is herein shown, the web-feeding mechanism has not been illustrated but I have shown the terminal gear 7 of the train of gears which actuates said web-feeding mechanism.

As more particularly disclosed in the aforesaid Weller application Serial No. 636,490, filed October 6, 1932, the projector herein illustrated comprises a lamp housing 8 which, in suitable manner, supports a socket 9 for a lamp 10, the projecting beam of light passing from right to left, Fig. 1, through a passage 8a formed in said lamp housing 8. As the projecting light beam passes in the direction just stated, it traverses a pair of condenser lenses 11 supported in a housing 12 suitably secured to said lamp housing 8. At the side thereof removed from the lamp housing 8, the condenser housing 12 comprises a passage 12a through which the projecting light beam passes and thereafter engages a mirror 13 by which said projecting light beam is directed vertically up so as to traverse an objective lens 14, the projecting light beam thereafter engaging a suitable mirror system, not shown, by which it is directed to the projection screen.

The mirror 13 and objective lens 14 are carried by a bracket 15 which is secured to a frame 16, the latter comprising members 16a which extend downwardly on the respective opposite sides of the projection field and, at their lower ends, carry a transverse member 17 upon which a plurality of spaced wheels 18 of knife-edge construction are mounted. Each of the wheels 18 is adapted to hold the adjacent section of the web W in engagement with a finger 19, all of these fingers being pivoted on a rod 20 carried by the condenser housing 12 and each finger being biased in a counter-clockwise direction, Fig. 1, under the influence of gravity.

Above the projection field, the condenser housing 12, at each side thereof, comprises an ear 12b which carries a horizontal shaft 20 having

secured thereto a plurality of feed rollers 21, said shaft 20 being connected by a flexible shaft 22 to a gear wheel 23 mounted on a support secured to the printer P, said gear wheel 23 meshing with and being driven by the aforesaid gear wheel 7.

The frame 16, at the respective opposite sides of the projection field 12a, comprises spaced lugs which support a rod 24 upon which a plurality of rollers 25 are mounted. As illustrated, the rollers 25 are loosely mounted on the rod 24 and, accordingly, they are biased in a downward direction by action of gravity.

As shown, the web W extends upwardly through the projection field and is disposed between the feed rollers 21 on the one hand and the rollers 25 on the other hand, the rollers last named holding the web in engagement with said feed rollers 21.

In operation, the printer P is actuated under remote control to cause all or a part of a line of characters to be printed transversely on the web W. After completion of the printing of such line of characters, the operator, by a control suitably effected, causes the printing wheel 1 to be returned to its initial position and, at this time, the gear wheel 7 hs a step of rotative movement imparted thereto whereby, under the control of the gear wheel 23 and shaft 22, the feed rollers 21 have imparted thereto a step of rotative movement in a clockwise direction, Fig. 1, whereby the web W is moved a corresponding line space through the projection field 12a.

Referring to Fig. 1, suitable stapling mechanism S is shown as supported in operative position in any siutable manner, as, for example, by one or more standards or members 30 secured to and upstanding from the aforesaid lamp housing 8. Carried by the standards 30 are a pair of side plates 31 and 31, Fig. 3, which are vertically secured in spaced relation by a plurality of tie rods 32, or equivalent.

Pivotally supported in any suitable manner, as by one of the tie rods 32, are a pair of spaced arms 33 secured together at their free ends by a transverse rod 34, Fig. 1, on which is supported a web-engaging roller structure 35 comprising, preferably, a plurality of knife-edged, freely rotatable disks 36.

Extending transversely between and suitably secured to the aforesaid side plates 31 is a plate 37 which, at its opposite sides, comprises the respective passages 37a. Disposed above each passage 37a and suitably secured to the plate 37 is an anvil 38. Disposed below each passage 37a is a hammer 39 of a suitable stapling unit 40 loosely supported on a pivot 41 carried by and projecting from the adjacent side wall 31. Disposed in vertical alinement with each passage 37a and forming a support for the stapling unit 40 is the reciprocating armature 42 of a solenoid or coil 43, these solenoids 43 being supported in any suitable manner as by brackets extending laterally from the respective side plates 31, and said solenoids 43 being connected in circuit-relation with each other in any suitable manner, not shown.

At one side of the aforesaid plate 37, the side plates 31, 31 support a horizontal shaft 44 to which one or more web-engaging rollers 44a are secured and carrying, at one end thereof, a worm wheel 45 with which coacts a worm gear 46 adapted to be rotated by a flexible shaft 47 operated, in turn, by a suitable electrical motor 48.

Each of the aforesaid side plates 31, 31 may comprise an upstanding section 49 and each upstanding section comprises a slot elongated in a vertical direction in which is received a shaft 50 carrying a plurality of weighted rollers 51.

Extending horizontally between and suitably secured to the side plates 31, 31 is a shaft 52 which serves as a support for a web roll 53, the web W1 of which corresponds in width with that of the aforesaid web W. This web W1 extends over an idler roller 54 carried by one of the tie rods 32, said web W1 further extending between the rollers 44a and the rollers 51. When the web W1 is thus positioned, it is disposed above the plate 37 and the edges thereof are disposed below the respective anvils 38.

In accordance with the invention, the web W_2 after passing beyond the above described feeding roller 21, is disposed upon the upper side of an idler roller 55 carried by a tie rod 32, the web W thereafter being extended beneath the roller structure 35 and then being disposed flatwise on the aforesaid web W1 so as to pass over the idler roller 54 and beneath the anvils 38, and then between the rollers 44a and rollers 51.

Referring to Fig. 2, one of the hereinbefore described pivoted arms 33 is shown as having secured thereto a contact member 60 coactable with an adjacent contact member 61 mounted in fixed position in any suitable manner. Secured to the movable contact member 60 is one end of a conductor 62 which is connected with one terminal of the aforesaid electrical motor 48, the other terminal of this motor 48 having connected thereto a conductor 63 which leads to a suitable source of electrical energy, not shown. The fixed contact member 61 has connected thereto a conductor 64 which may include a variable resistance unit 65, said conductor 64 being connected to a fixed contact member 66 with which is coactable a movable contact member 67, the contact members 66, 67 being suitably supported by a bracket, or equivalent, carried by the adjacent side plate 31. The movable contact member 67 comprises a section 67a which engages with and is controlled in position by an armature 42 of one of the solenoids 43. Connected to the movable contact member 67 is a conductor 68 which leads to the other terminal of the aforesaid source of electrical energy.

The hereinbefore described shaft 44 has secured thereto a disk 69 carrying a lateral pin 70 coactable with a movable arm 71a carrying a contact member 71. Connected to the contact member 71 is a conductor 72 which leads to one terminal of the above described circuit-connected solenoids 43. The other terminal of the solenoids 43 has connected thereto a conductor 73 which leads to and is connected to the aforesaid conductor 68. Coactable with the above described movable contact member 71 is a fixed contact member 74 which has connected thereto a conductor 75 leading to and connected with the aforesaid conductor 63. The contact members 71, 74 are suitably supported by a bracket, or equivalent, carried by the adjacent side plate 31.

As clearly appears from the drawings, the two webs W and W1 are disposed in face-to-face relation between the rollers 44a and the rollers 51. As described, said rollers 51 are weighted and, therefore, bias the adjacent web sections toward the rollers 44a. Accordingly, when the shaft 44 is rotated in a clockwise direction, Figs. 1 and 2, it results that the webs W and W1 are moved as a unit from left to right, Fig. 1, and, while thus

moving, they pass above the plate 37 and beneath the anvils 38.

As hereinbefore described, the printer P is intermittently actuated to move the web W a line space at a time through the projection field 12a. When this happens, that section of the web W between the rollers 21, 25 on the one hand and the rollers 44a, 51 on the other hand tends to become more or less slack. However, this slack is taken up by the lever arrangement comprising the pivoted arms 33 which move in a counter-clockwise direction, Figs. 1 and 2, and, in so doing, close the contact member 60 upon the contact member 61. When this happens, a circuit is completed through the motor 48, this circuit extending from one terminal of the source of electrical energy by way of the conductor 63, the winding of motor 48, conductor 62, contact member 60, contact member 61, conductor 64, contact member 66, contact member 67 and thence back to the other terminal of the source of current by way of the conductor 68. By the described mechanical connection comprising the flexible shaft 47 and associated parts, the motor 48, when thus energized, imparts rotary movement to the shaft 44 in a clockwise direction, Fig. 1, whereby the webs W and W1 are moved in a unitary manner from left to right, Fig. 1, with respect to the anvils 38.

Each time that the disk 69 of the shaft 44 rotates through an angle of 360 degrees, the pin 70 thereon engages the arm 71a of the movable contact member 71 to thereby move the latter into engagement with the adjacent fixed contact member 74. When these two contact members are thus closed, a circuit is completed through the solenoids 43, this circuit extending from one terminal of the source of electrical energy by way of the conductor 68, conductor 73, the solenoids 43, conductor 72, contact member 71, contact member 74, conductor 75 and thence back to the other terminal of the source of electrical energy by way of the conductor 63.

When the solenoids 43 are thus energized, the stapling units 40 are swung in a counter-clockwise direction, Figs. 1 and 2, about their respective pivots 41, said stapling units 40 coacting with the respective anvils 38 to drive staples *s* through the webs W, W1 adjacent the respective opposite edges thereof and to clinch said staples *s* in the manner indicated in Fig. 5.

It will be noted that the operating circuit of the motor 48 includes the contact members 66, 67 and that these contact members are open when the solenoids 43 are energized, i. e., when the stapling units 40 are in their upper positions, Fig. 6. It follows, therefore, that under these conditions, the motor 48 is ineffective, except when coasting, to cause the side-by-side webs W, W1, to be moved from left to right, Fig. 1, even though the contact members 60, 61 should be closed by operation of the printer web-feeding mechanism. This is a safety feature preventing movement of the webs while the stapling operation is being effected. However, it is to be understood that the use of the arrangement comprising the contact members 66, 67 is optional. Under ordinary circumstances, the pin 70 and arm 71a are so related to each other that said pin 70 passes beyond and releases said arm 71a immediately after the contact members 71, 74 are closed. Therefore, since the solenoids 43 are held energized for only a short interval, it follows that the use of the described safety control on the motor 48 is usually an optional matter.

In view of the foregoing, it will be understood that the mechanism of my invention produces a pair of webs which are stapled together as indicated in Figs. 4 and 5. This is desirable for the reasons hereinafter noted.

A projector of the character illustrated in Fig. 1 is one wherein the projecting light beam passes through the web section in the projection field. Therefore, it follows that the web W is necessarily largely or substantially transparent. Projectors of the character thus described are usually found in brokers' offices and other public places and it is customary, afer a section of the web has been fed beyond the rollers 21 and 25, to tear or cut off this web section so that the same may be suspended for visual observation. However, by reason of the transparent character of the web, it is difficult to read the information which has been printed thereon by the type wheel 1.

This difficulty is overcome by the use of the herein described web W1 which should be more or less opaque and formed preferably from ordinary brown or white paper. This web W1, when stapled to the transparent web W, forms a non-transparent backing enabling the characters on the web W to be read with ease. Sections of these attached webs may readily be hung in a convenient location and observed as desired.

Referring to the form of my invention illustrated in Fig. 8, the hereinbefore described contact members 71, 74 are shown as secured, respectively, to a support 80 fixed to the adjacent side plate 31 and to a movable support 81 suitably pivoted as shown at 82 to said side plate 31. The pivoted support 81 is biased toward contact-opening position by a suitable spring 84 which is secured to the fixed support 80 and engages said pivoted support 82. Suitably pivoted to said side plate 31, as at 85, is a hammer member 86 which comprises an extension 86a adapted to be engaged by the aforesaid pin 70 of the disk 69. Pivotal movement of the movable support 81 and the hammer member 86 in opposite directions, Fig. 8, may be limited, if necessary, by a suitable stop member 87 secured to and projecting from said side plate 31. When the pin 70 engages the extension 86a of the hammer member 86, the latter is swung in a counter-clockwise direction, Fig. 8. When said pin 70 moves beyond the extension 86a, the hammer member 86 drops onto the movable support 81 and moves the same clockwise, Fig. 8, whereby the contact members 71, 74 are momentarily closed, the latter, in turn, closing the circuit of the solenoids 43 to thereby effect the stapling operation in the manner described. This operation is repeated each time that the pin 70 engages and then releases the extension 86a.

In Fig. 9, I have illustrated a modified form of the invention wherein the respective positions of the anvil 38 and the stapling unit 40 have been reversed. Thus, in Fig. 9, the anvils 38 are disposed below the webs W, W1 while the stapling units 40 together with the respective solenoids 43 therefor are disposed above said webs. In connection with an arrangement of this character, it will be understood that each stapling unit 40 should be biased by a suitable spring, not shown, in a counter-clockwise direction, Fig. 9.

The herein described stapling units 40 may be and preferably are of conventional construction such, for example, as those such as the Markwell stapler which customarily serve for desk use in attaching a plurality of papers together by a manual operation. It is well understood that, in such a stapling unit, the staples are enclosed in the illustrated chute or hopper and that they

are automatically fed individually and in succession to the stapling position.

Although the invention has been illustrated and described in connection with a particular mechanism for attaching the transparent web and its opaque backing together by staples, it shall be understood that the invention is not to be thus limited. Thus, stapling mechanism, when employed, may differ substantially from that therein disclosed.

It shall also be understood that, in its broader aspects, the invention is not to be limited to the use of staples for attaching the two webs together. Thus, it will be understood that said webs may be attached by folded tabs which are cut from the webs. Or, if desired, adhesive may be used in spots or otherwise to positively secure the two webs together for the desired purpose.

Although the invention has been described with respect to relative wide webs of the character used in the art for printing and/or projecting news items, it shall be understood that the invention is not to be thus limited. As well, if desired, the invention may be practiced in connection with narrow tapes or with webs wider than those disclosed. The term "web" in the appending claims shall be understood as covering such tapes or webs.

While the invention has been described with respect to certain particular preferred examples which give satisfactory results, it will be understood by those skilled in the art after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. In combination, means for printing characters on a transparent or translucent web, means for moving said web with respect to said printing means and then through a projection field, means for moving an opaque web into face-to-face relation with respect to said first named web after the latter has passed beyond said projection field, and means for attaching said webs together, said opaque web forming a backing for said transparent or translucent web whereby the characters thereon may be read with ease.

2. In combination, means for printing characters on a transparent or translucent web, means for moving said web with respect to said printing means and then through a projection field, means for moving an opaque web into face-to-face relation with respect to said first named web after the latter has passed beyond said projection field, and means for attaching opposite sides only of said webs together in spaced zones extending longitudinally thereof, said opaque web forming a backing for said transparent or translucent web whereby the characters thereon may be read with ease.

3. In combination, means for printing characters on a transparent or translucent web, means for moving said web with respect to said printing means and then through a projection field, means for moving an opaque web into face-to-face relation with respect to said first named web after the latter has passed beyond said projection field, means for moving said webs along a path while thus maintained in face-to-face relation, and means for attaching opposite sides only of said webs together, said opaque web forming a backing for said transparent or translucent web whereby the characters thereon may be read with ease.

4. In combination, means for printing information on a transparent or translucent web, means for moving said web with respect to said printing means and then through a projection field, means for moving an opaque web into face-to-face relation with respect to said first named web after the latter has passed beyond said projection field, means for moving said webs along a path while thus maintained in face-to-face relation, means controlled by said first named web for operating said last named means, and means for attaching opposite sides only of said webs together.

5. In combination, means for printing information on a transparent or translucent web, means for moving said web with respect to said printing means and then through a projection field, means for moving said first named web and an opaque web along a path while maintained in face-to-face relation, stapling means at the respective opposite sides of said path, and means for operating said stapling means to thereby attach the opposite sides only of said webs together in spaced zones extending longitudinally thereof.

6. In combination, means for printing information on a transparent or translucent web, means for moving said web with respect to said printing means and then through a projection field, means for moving said first named web and an opaque web along a path while maintained in face-to-face relation, means controlled by said first named web for operating said last named means, stapling means at the respective opposite sides of said path, and means for operating said stapling means to thereby attach the opposite sides only of said webs together in spaced zones extending longitudinally thereof.

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