May 19, 1953 R. P. LEAVITT ET AL 2,638,827

PRINTER PLATEN CONSTRUCTION

Filed July 28, 1949

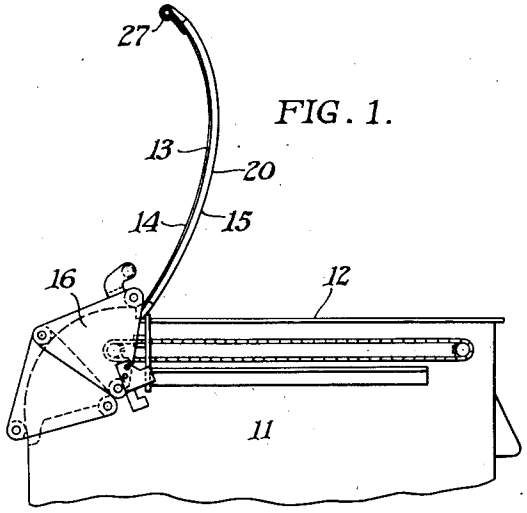


FIG. 1.

FIG. 2.

FIG. 3.

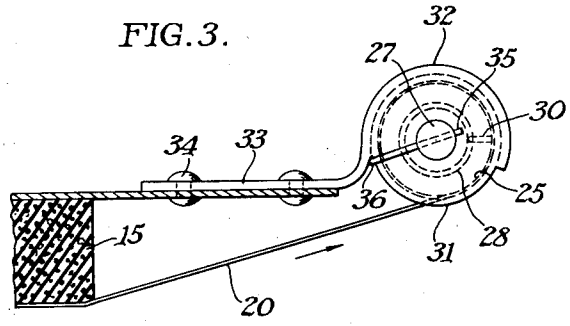
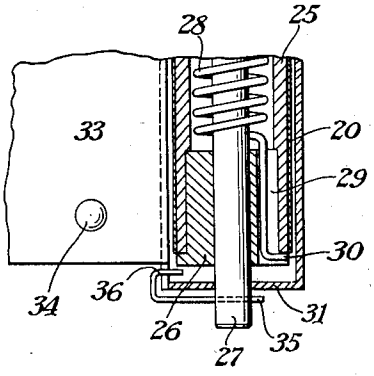


FIG. 4.



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Patented May 19, 1953

2,638,827

UNITED STATES PATENT OFFICE

2,638,827

PRINTER PLATEN CONSTRUCTION

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Application July 28, 1949, Serial No. 107,234

1 Claim. (Cl. 95—73)

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The present invention relates to contact printers, and more particularly to a platen of the type shown and described in the applicants' copending application No. 720,866, filed January 8, 1947, now Patent No. 2,533,481, issued December 12, 1950.

This application discloses and describes a platen which consists of a curved flexible metal sheet, on the convex or under side of which is cemented an "Airfoam" rubber sheet. The rear end of the platen is hingedly or pivotally connected to the printer, and, when in its elevated or inoperative position, the platen automatically assumes a curved or flexed relation. However, when the platen is lowered to its print-engaging position, it flattens substantially into a plane, and the rubber layer is compressed to hold the print securely in position over the printing aperture. The platen itself forms no part of the present invention, and reference may be had to the above-mentioned application for information as to the structural details thereof.

It has been found, however, that with a platen of the type described, the lowering of the platen to its print-engaging position may cause the surface of the rubber layer to slip on the print and displace the latter, the disadvantages of which are apparent to those familiar with devices of this type. In order to overcome this disadvantage, the present invention proposes using a fabric covering over the curved exposed surface of the rubber pad. This covering is arranged so that as the curved platen and its rubber layer or pad flattens out when moved to print-engaging position, the fabric covering which is positioned between the rubber layer and the print is maintained taut. The fabric is not secured to the rubber layer; but, on the contrary, it is laid loosely thereover so that the covering is free to slide over the rubber layer as the difference in lengths occurs when the shape changes from curved to straight. By means of this arrangement, slippage of the printing material is eliminated because the rolling action of the rubber layer is given a fabric tread on which to slip. One end of the covering is anchored, while the other is secured to a spring roller carried by the platen so that the covering is always maintained taut in all positions of the platen so that creases and/or folds in the covering are eliminated so as to insure good contact between the platen and the material to be printed, the advantages of which are apparent.

The present invention has as its principal object the provision of a tightly drawn fabric covering for use in connection with a curved flexible platen.

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Another object of the invention is the provision of an attaching means for such a covering which eliminates the use of adhesive-securing means.

Yet another object of the invention is the provision of a covering which is mounted to permit relative movement between the platen and the covering when the platen is moved so as to prevent displacement of the print.

And another object of the invention is the provision of a covering means which is simple in construction, easily attached even to existing platens, and highly effective in use.

To these and other ends, the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claim at the end of the specification.

In the drawings:

Fig. 1 is a partial side view of a photographic printer, showing the relation thereto of a curved flexible platen to which the covering of the present invention is applied;

Fig. 2 is a view of the platen, on a larger scale than in Fig. 1, showing the relation thereto of the fabric covering of the present invention, and the arrangement by which the covering is maintained taut in all positions of the platen;

Fig. 3 is a partial view of the platen illustrated in Fig. 2, showing the spring roller to which one end of the covering is secured for maintaining the covering taut, and the roller-supporting bracket or mount; and

Fig. 4 is a partial bottom view of the roller and mount, with the roller in sections, showing the relation of the parts.

Similar reference numerals throughout the various views indicate the same parts.

Fig. 1 shows a printer which comprises a housing 11, the top 12 of which is provided with a printing aperture over which the negative and sensitized paper or sheet are placed to print the image of the negative onto the sheet, as is well known. The printer is provided with a platen, broadly designated by the numeral 13, which is hingedly connected at one end (left end) to the housing. This platen comprises a curved flexible metal plate 14 on the convex or under side of which is cemented a layer of "Airfoam" rubber 15, or other similar compressible material. In its inoperative or raised position, Fig. 1, the platen assumes automatically a curved relation. When, however, the platen is moved to its oper-

ative or print-engaging position, it lies flat or substantially in a plane, as is deemed apparent. The platen may be moved to and from its operative position manually, or it may be moved to its operative position by a movable carriage, broadly designated by the numeral 16. When the carriage is moved to the right, it lowers the platen against the print, and also serves to compress the rubber layer 15. The structure so far described is identical to that illustrated and described in the above-mentioned co-pending application and forms no part of the present invention. Details of the parts above mentioned may be obtained from the above-mentioned application.

It has been found that when the platen 13 is lowered from its curved position, shown in Fig. 1, to its flat print-engaging position, that the length of the exposed surface of the rubber pad 15 changes and this change produces a relative movement between the pad surface and the print, and may tend to displace or move the latter relative to the printing aperture, the disadvantage of which is deemed apparent. In order to overcome this disadvantage, the present invention provides a covering 20 which overlies, but is not secured to, the exposed surface of the rubber pad 15. The covering engages the print without moving relative thereto so as to maintain positively the print in its proper position over the aperture. Also, because of the rolling action of the pad 15 as the platen is lowered, the pad is given a fabric tread on which to slip so that the slip of the pad is not transmitted to the print which is held securely and accurately in place by the stationary fabric covering 20.

In order to secure this result, the covering 20 must be free to move relative to the pad 15, yet remain taut at all times so as to prevent the formation of creases or wrinkles in the fabric, the disadvantages of which are obvious. To this end, the fabric covering 20 is arranged to overlie the rubber pad 15, as best shown in Fig. 2. This covering has the end 21, adjacent the pivot point of the platen, anchored to the top 12. This anchoring may be accomplished in a variety of ways. For example, the left end of the covering may be formed with a turned seam which is wrapped about 2½ turns, around a flat bar 22, the ends of which are secured to the top 12 by bolts or screws 23. Thus one end, the left end, of the covering 20 is securely anchored to the top of the printer.

It will be apparent from an inspection of Fig. 2, that the pad 15 and the covering 20 have a slightly different radii of curvature. Therefore, in order to compensate for the differential lengths which occur when the platen is lowered, means must be provided for taking up the covering to maintain the latter taut so as to eliminate any possibility of wrinkles and/or folds forming in the covering when the latter is in print-engaging relation. In order to accomplish this result, the present invention provides means for spring-mounting or tensioning the free or right end of the covering 20. In the preferred arrangement, this tensioning is secured by means of a spring roller secured to the free end of the platen 13. A bar, similar to bar 22, is passed through a turned seam at the right end of the covering and this second bar can be secured to the roller in any suitable manner. This spring roller serves to draw the covering 20 tightly over the rubber pad 15, and, when the platen is lowered, winds up or draws the covering slightly, as the length of the pad changes so as to insure that the covering is smoothly and tightly drawn over the platen and in contact with the print. As the covering does not move along the top as the platen is lowered, the print does not slip but is held in proper printing position.

The spring roller construction comprised in the present embodiment, a hollow metal roller 25, the ends of which are counterbored to receive pressed-in plugs 26 which support the opposite ends of a shaft 27 which extend through and projects from the opposite ends of the roller 25, one end of the roller being shown in Fig. 4. A coil spring 28 surrounds the shaft and has one end, not shown, connected to the shaft while the other end extends through an axial hole 29 formed in one of the end plugs and terminates in a radial bent end 30 which extends through a registering radial hole in the plug 26, all as clearly illustrated in Fig. 4. The ends of shaft 27 are supported in end plates 31 secured to or formed from a curved portion 32 of a supporting plate or bracket 33 secured to the end of the metal plate 14, as best shown in Fig. 3.

In order to retain the covering 20 in a taut relation, the spring 28 is wound up or tensioned. To secure this result, the shaft 27 and roller are rotated relatively to wind up the spring 28 in a well known manner. When the spring has been properly tensioned, one leg 35 of the U-shaped pin is inserted in a registering hole in the exposed end of the shaft 27, and another leg 36 of the pin is positioned in a registering hole in the curved portion 32 of the bracket to retain the shaft against rotation. Thus, spring 28 is maintained under tension and tends to turn the roller to wind up or draw the covering 20 tightly across the surface of the rubber pad 15. As the platen is lowered, and assumes a flat position, the length of the covering decreases. Such decrease causes the roller to function to wind up the covering and maintain the latter in a taut relation over the rubber pad. This covering does not move relative to the print so that the latter is retained in proper position. Also, the covering provides a fabric tread on which the rubber pad may roll or slip without disturbing the position of the print. By spring-mounting the covering, adhesive means are eliminated, thus preventing creases or folds from forming in the covering so as to insure good contact, the advantages of which are deemed apparent. The elimination of folds or creases in the covering materially increases the life of the covering.

The covering 20 should be of a composition which allows free slippage of the rubber pad on the covering as the platen is moved so as to enable the covering to be retained always in a taut relation and free of wrinkles or creases. Also, the covering should be tough yet flexible so as to withstand continued usage. It has been found that Nylon Neoprene cloth meets these specifications. The designation of such a material is not, however, intended as a limitation but merely as an illustration of one suitable form of material. Other materials which meet the specifications may obviously be used.

The present invention thus provides a flexible curved platen structure which may be moved to its flat print-engaging position without disturbing the position of the print. This result is secured by providing a cloth covering for the pad of the platen and this covering is held in position without the use of adhesives, thus eliminating any possible formation of creases or wrinkles in the covering when the platen is lowered in

the print-engaging position, thus insuring good contact between the negative and the sensitized print. The taut covering arrangement may be applied to existing machines without material alteration thereof. The slippable covering is simple, easy to apply and highly effective in use.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive idea may be carried out in a number of ways. This application is, therefore, not to be limited to the precise details disclosed, but is intended to cover all variations and modifications which fall within the scope of the appended claim.

We claim:

In a photographic printing apparatus having a top formed with a printing aperture, the combination with a flexible platen which is hinged at one end to said top and which assumes a curved relation when in its inoperative position and is movable substantially into a plane when in its operative position to hold a sensitive sheet over said aperture, said platen having a layer of compressible material secured to the under surface thereof, the exposed face of said material decreasing in size as the platen is moved from its inoperative to its operative position, of a fabric covering arranged in overlying relation and in positive contact with the full area of said face in both positions of said platen, means for anchoring one end of said covering adjacent said one end of said platen, and spring means carried by the other end of said platen and connected to the other end of said covering to maintain the covering in a taut relation over and in positive contact with said face in both positions of said platen, the movement of said platen to its operative position causing said layer to move relatively over said covering as said face decreased in size, and said spring means taking up any slack in said covering as said platen is moved to its operative position to provide a smooth member which engages said sheet without slipping relative thereto.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,093,509	Weidner	Apr. 14, 1914
1,144,014	Westman	June 22, 1915
2,155,149	Rutherford	Apr. 18, 1939
2,364,580	Young	Dec. 5, 1944
2,421,150	Jacobson	May 27, 1947

FOREIGN PATENTS

Number	Country	Date
194,524	Great Britain	Mar. 15, 1923