Dec. 17, 1929. C. L. FUNTAN 1,740,293

LIGHT PRINT (BLUE PRINT) MACHINE

Filed Oct. 15, 1927

Fig. 1.

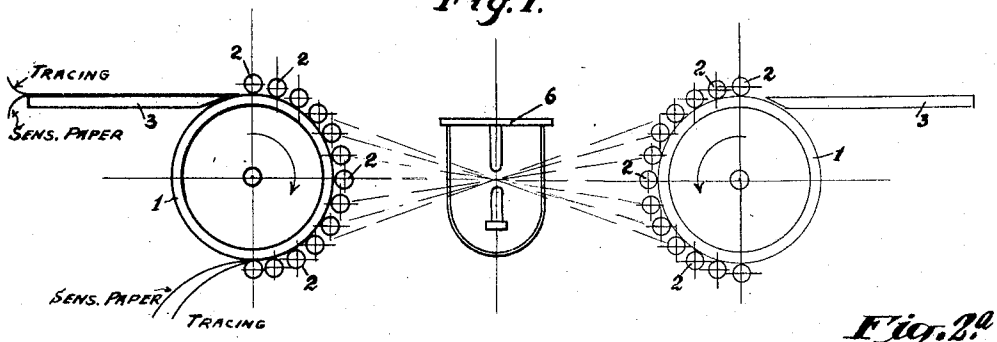


Fig. 2.

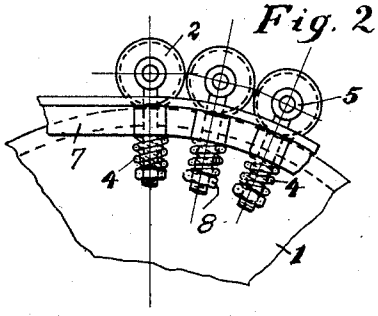


Fig. 2a

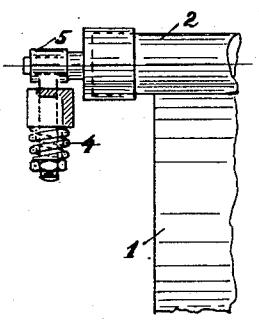


Fig. 3.

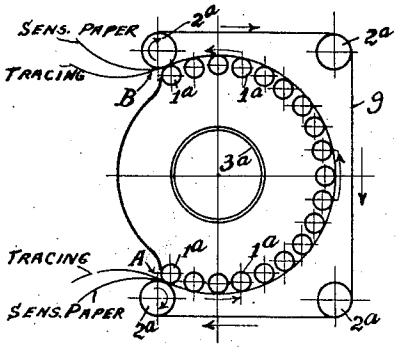
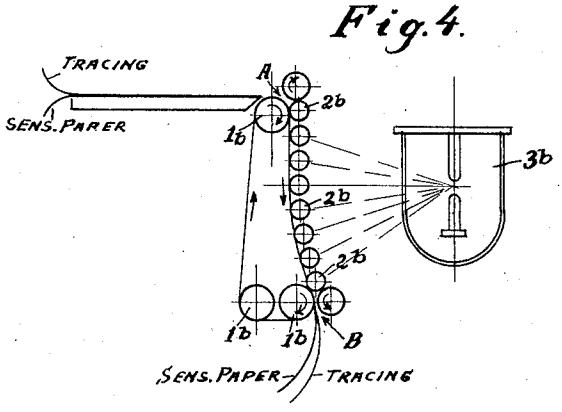


Fig. 4.



Witnesses:
Robt. P. Tourner
William Kunzler.

Inventor
Charles L. Funtan

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UNITED STATES PATENT OFFICE

CHARLES L. FUNTAN, OF PATERSON, NEW JERSEY

LIGHT-PRINT (BLUE-PRINT) MACHINE

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This invention relates to light-printing machines and its object is to provide an apparatus of this class which will avoid the use of the expensive and easily breakable glass cylinder commonly forming one of the coactive means to keep the two sheets—sensitized and tracing or "image" sheets—flat while passing through the machine or the belts or aprons sometimes used as a substitute for the cylinder. Certain other advantages will be hereinafter pointed out.

In the drawing:

Fig. 1 is a diagrammatic side elevation of one form of the apparatus;

Fig. 2 is a fragmentary side elevation of such form;

Fig. 2ª a fragmentary elevation as seen from the right in Fig. 2, with a part of the frame in section; and

Figs. 3 and 4 diagrammatic side elevations of two other forms.

Around any cylinder 1 (Fig. 1) is arranged a multi-barred means whose bars 2 are cylindrical and here both spaced from each other and transparent and revoluble on their own axes and all have their axes parallel with the axis of the cylinder; these bars form rollers which coact with the surface of the cylinder to grip the two image and tracing sheets marked "Tracing" and "Sens. Paper," which may be fed between the cylinder and the series of bars over a table 3.

The operation is simple.

The tracing, lying on top of the sensitized paper, is placed on said table or feeding board 3 and shifted to the approach of the slow rotating cylinder 1 and rotating rollers 2. As soon as the tracing and sensitized paper slide between the cylindrical 1 and the first roller 2 they are drawn to the next roller by friction and all succeedig rollers, during which time they hug the cylinder with firm pressure, finally leaving the machine at the last roller. The pressure may be obtained by springs 4 interposed between a part 7 of the frame of the apparatus and adjusting nuts 8 screwed onto the threaded stems of bearing members 5 in which the trunnions of the rollers are journaled, said stems being slidable in the frame part 7 substantially radially of cylinder 2.

The rollers 2 can be driven by the friction of the cylinder 1 (and rollers) or more positively by gears. The driving gear is placed on the shaft of the cylinder 1, and every roller 2 is supplied with a pinion gear. The pitch lines harmonize to the diameters of cylinder 1 and rollers 2.

While the tracing and sensitized paper are passing through the above operation they are being affected by the light of electric arc lamps 6, mercury tubes or light of any kind.

The advantage of this construction is the omission of the expensive breakable glass cylinder and the perishable ribbons or belts used in other blue print machines. My machine affords better contact between the tracing and sensitized paper on account of its convexed position or form.

My machine can also be built as a double machine Fig. 1 to make the lights more economical.

Another construction of my machine is indicated in Fig. 3. This is an upright or vertical machine. The rotating glass rollers 1ª are placed in a semi-circle, one of the rollers 2ª being a driving roller which is united with rollers 1ª by an endless belt or by ribbons 9.

In the center is an electric arc lamp 3ª which moves up and down. The tracing and the sensitized paper is fed in at the point (A) and taken around the rotating glass rollers by the travelling belt or ribbon, leaving the machine at point (B).

Figure 4 indicates my machine as a horizontal machine similar to Fig. 1. There are three rollers 1ᵇ. One of them is a driving roller. The glass rollers 2ᵇ are placed so that they are lighted by electric arc lamps 3ᵇ, or mercury tubes or any other light.

The tracing and sensitized paper enter at point (A) and leave the machine at point (B). The sensitized paper and tracing are exposed under the same condition just as at machine Figure 1.

The machine Fig. 4 can also be constructed as a double machine as indicated in Fig. 1.

The tracing, which glides over the semi-

glass cylinder, causes the glass itself to become rough in time. This makes wear and tear on the tracing inevitable. The rotating glass rollers on my machine avoid all this.

Glass cylinders used on present day blue print machines become dirt spotted. Defects also appear in the glass itself. These defects in turn appear on the light print, because the spot, or spots, remain in the same place during the printing operation, thus casting a shadow on the paper continually. The rotating rollers indicated in my machine change their position to the paper constantly, so that should there be a speck of any kind on the glass rollers, it will practically leave no trace on the print. Furthermore, the light which, on my machine, strikes the tracing and sensitized paper direct, because of the space between the rollers, gives it an added advantage.

The invention will be accomplished if, having a backing means (as the cylinder in Figs. 1 and 2 or the belt in Figs. 3 and 4) to support the face-to-face-related sensitized and tracing or "image" sheets with the former adjoining said means, there is a multi-barred means between which and the first means the two sheets are edgewise movable and which has its bar portions (as 2, 1^a or 2^b) revoluble on their own longitudinal axes and substantially parallel and closely contiguous to each other, so that the sheets are kept in close contact with each other throughout their area, or form the sole support for said sheets opposed to the backing means and each cooperating with said first means to grip the sheet and such bars are transparent or at least translucent, to permit the light to reach the image sheet. By making the bar-portions revoluble on their own axes I avoid scratching or otherwise mutilating the image sheet and streaking the same with particles or substances that may alight thereon, besides easing the passage of the two sheets and reducing the chance of causing one to be shifted relatively to the other; by intergearing them in some way, as independently of the backing means or by gearing them all with the backing means, these results are insured.

While the device illustrated and described in the attached specifications embodies the preferred applications of my invention, it is possible to alter the construction and features shown and described without departing from the spirit of my invention, and I do not desire to limit the scope of my present application for a good and sufficient patent on the details and types of construction illustrated and described herein; but I do claim:

1. In a light-printing machine, the combination of backing means to support the face-to-face-related sensitized and image sheets with the former adjoining said means and a multi-barred means between which and the first means the two sheets are gripped and edgewise movable having its bar portions translucent and substantially parallel to and closely contiguous to each other and each revoluble on its own longitudinal axis and cooperating with said first means to grip the two sheets.

2. In a light-printing machine, the combination of backing means to support the face-to-face-related sensitized and image sheets with the former adjoining said means and a multi-barred means between which and the first means the two sheets are gripped and edgewise movable having its bar portions translucent and substantially parallel to and closely contiguous to each other and each revoluble on its own longitudinal axis and cooperating with said first means to grip the two sheets, said bar portions being intergeared to rotate together.

3. In a light-printing machine, the combination of backing means to support the face-to-face-related sensitized and image sheets with the former adjoining said means and a multi-barred means between which and said surface the two sheets are gripped and edgewise movable having its bar portions translucent and close to each other and constituting the sole support for said sheets opposed to the first means and each revoluble on its own longitudinal axis and cooperating with said first means to grip the two sheets.

4. In a light-printing machine, the combination of backing means to support the face-to-face-related sensitized and image sheets with the former adjoining said means and a multi-barred means between which and said surface the two sheets are gripped and edgewise movable having its bar portions translucent and close to each other and constituting the sole support for said sheets opposed to the first means and each revoluble on its own longitudinal axis and cooperating with said first means to grip the two sheets, the second means being geared with the respective bar portions.

CHARLES L. FUNTAN.