Aug. 28, 1945. S. A. FOSTER 2,383,785

PHOTOGRAPHIC PRINTER

Filed Oct. 22, 1943

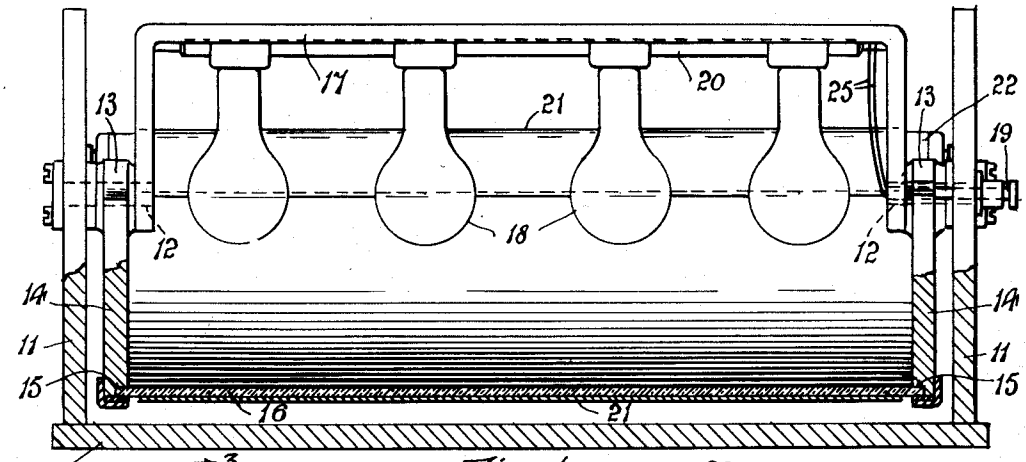


Fig. 1.

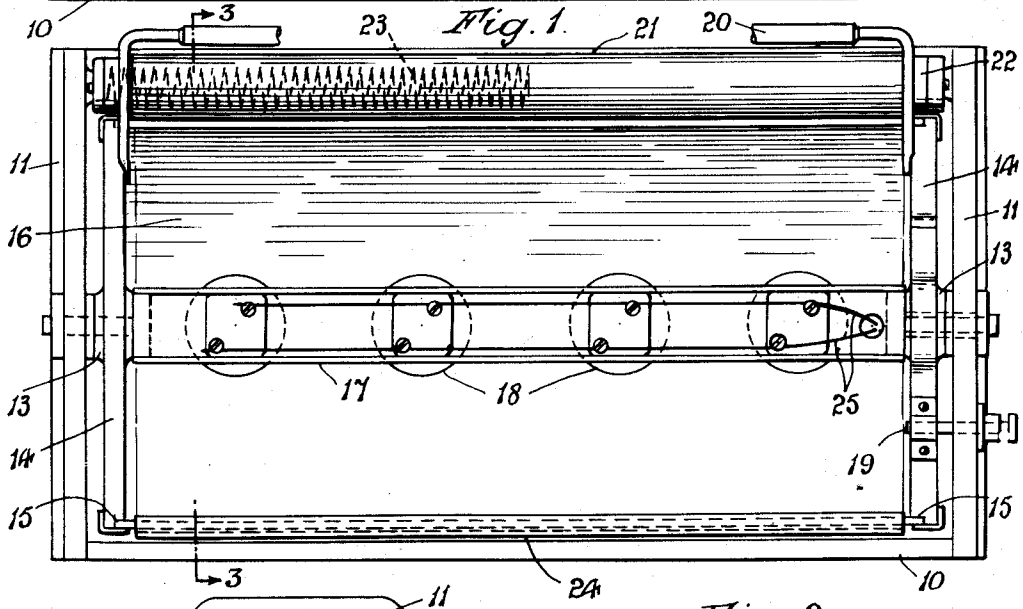


Fig. 2.

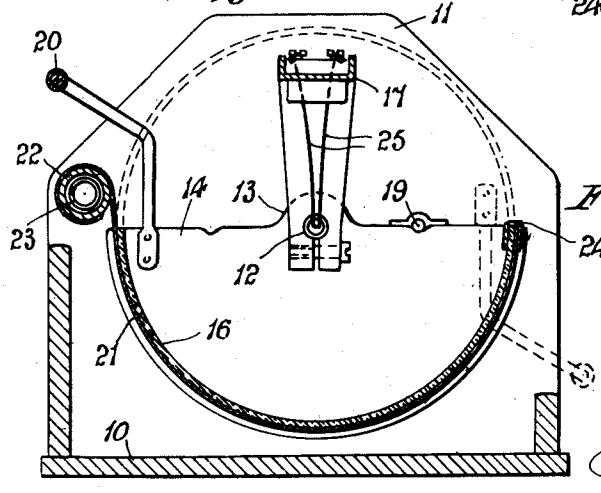


Fig. 3.

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PHOTOGRAPHIC PRINTER

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3 Claims. (Cl. 95—77.5)

This invention relates to photographic printing machines, more particularly for blue printing and has for its object to provide a simple, compact and easily operable device which may be produced cheaply and which lends itself very conveniently either to the printing of single sheets from time to time or the steady operation of printing a large number of sheets one after the other without requiring changes of adjustment or operating technique whether a large number or only a few prints are to be made.

The improved printing device admits of being made in many sizes and is especially adaptable as a portable unit such as for small plants where it is used occasionally; and the printing device also admits of prints of any size from the largest for which it is designed down to the smallest print which may be desired without change of mechanism or adjustment and with equal facility.

The improved device is characterized by its easy loading features whereby the negative and the printing paper are spread in loading on a surface conveniently disposed to the operator and moved by a simple rotary motion by the hands in full control of the paper into the printing position. Efficient support of the paper with proper relation to the negative and to the source of light during the printing operation is also secured in a very simple and practical manner.

It is also an object of the invention to provide a printing device of the type referred to wherein the problem of ventilation to contend with heat from the source of light is not imposed and no fans or ventilating ducts are required to promote a cooling circulation or to permit the escape of heated air from the printing chamber. Said invention is characterized by the printing chamber being in the form of a semi-circular or trough like transparency freely open at the top and capable of inversion to a non-printing position for the application of the paper and negative thereto.

Still further the said invention has for its object to provide for the entrapment of printing paper and its negative progressively between the said transparency and a flexible backing sheet as the said transparency is rotated from an upper loading position to its lower printing position; and it is also an object of the said invention to provide the said backing sheet with tension means whereby as the print and its negative are rotatively entrapped between the said backing sheet and the transparency even pressure throughout the area of the entrapped paper will be secured and maintained.

A still further object is to provide tensioning means for the backing sheet so arranged as to withdraw the said sheet from said transparency as the transparency is removed from the printing to the loading position; and still further, the invention contemplates the tensioning means being in the form of a spring roller upon which the said backing sheet is automatically rolled as the said transparency is rotated from its printing position.

A still further object is to provide in a device of the type referred to, a light controlling switch subject to operation by the rotating of the transparency into printing position.

Still further objects and advantages subsidiary to the aforesaid objects or resulting from the construction or operation of the invention as it may be carried into effect will become apparent as the said invention is hereinafter further disclosed.

In carrying the said invention into effect, I may provide a frame having end members in which the trunnions of a semi-cylindrical transparency are rotatively mounted, said trunnions being attached by suitable means to the ends of said transparency and disposed on the horizontal axis thereof, a source of illumination mounted to extend along the horizontal axis of said transparency, said transparency being rotatable on such horizontal axis about said source of illumination to its upper loading and lower printing positions, and a flexible sheet carried by a spring roller, said sheet being attached to the near edge of said transparency and wound on said roller when the said transparency is in its upper loading position whereby it will be progressively wound on the outside of said transparency against the tensioning effect of said spring roller as said transparency is rotated to its lower printing position. All of which is more particularly described and ascertained hereinafter, by way of example, having reference to the accompanying drawing, wherein—

Figure 1 is an elevation, partly in section, of the improved printing device;

Figure 2 is a plan of the same; and

Figure 3 is a transverse section of the same taken on a plane indicated by a line 3—3 in Figure 2.

Similar characters of reference indicate similar parts in the several figures of the drawing.

10 indicates the base of the box or frame of the printer having upstanding end members 11 each carrying a pin 12 on a common axis and extending inwardly of the box to receive tubular trunnions 13 of transparency-supporting frames, 14. The opposed faces of these frames 14 are shown as being arcuately recessed at 15 to receive and hold opposite ends of a semi-cylindrical transparency 16, which may be of glass, plastic or other material suitable for the purpose.

Fixedly connected to and supported by the inner ends of the said pins 12 is a bridge 17, of a height less than the inner radius of the said transparency and of a length less than the spac-

ing between the frames 14 whereby the said transparency may be rotated about its axis without interference by the said bridge, and this bridge has mounted thereon, by means of suitable fixtures, a series of lamps 18 so disposed that their filaments are arranged substantially along the line of the axis of said transparency for effectively even illumination thereof.

It will be seen that the said transparency may be rotated from the downwardly depending position shown in full lines in Figure 3 to an upper inverted position as shown in dotted lines in the said Figure 3, and to hold the said transparency in its upper inverted position a stop may be provided as a rest to prevent its rotation beyond a desired point. This stop may be in the form of a retractable pin 19 mounted in one of the end members of the box as shown. 20 is a handle which may be provided to facilitate rotating the said transparency to either of its positions of operation.

21 is a flexible sheet of any suitable material mounted on a roller 22 which is controlled by a spring 23, so tensioned as to normally maintain said sheet wound on the roller, which roller extends across the back of the box between the end members 11 immediately exterior to the path of travel of the transparency when it is rotated, and the free end of this blanket is attached as by a clamping strip, 24, to that edge of the transparency which is adjacent to said roller when the said transparency is in its upper inverted or loading position. This edge is remote from the roller when the said transparency is in its lower printing position as clearly shown in the drawing.

Thus, when the said transparency is in its upper position the flexible sheet 21 is entirely wound on the roller except for the short end portion extending to the adjacent edge of the transparency, and the said transparency is then totally uncovered and openly exposed to the operator so that a negative and printing paper may be readily laid thereon and smoothed into position, if necessary, with their rear edges presented toward the junction between the transparency 16 and the said flexible sheet 21. Consequently, if the transparency be thereafter rotated away from the operator in the direction necessary to invert it, the said flexible sheet 21 will be progressively withdrawn from the roller 22 against the tension of its spring 23 thereby entrapping the rear edges of the negative and printing paper which are then drawn with the said flexible sheet around the said transparency and held in close contact therewith until the rotation has been completed to the lower printing position, when both the negative and the printing paper are firmly and smoothly held in contact with and about the outer surface of the said transparency. In this position of the parts, the printing may be effected by simply switching on the lamp as designed. 25 indicates electric wiring which may pass through one of the pins 12 to any suitable switching device (not shown).

Reversal of the operation just described to bring the transparency back to its uppermost or loading position will result in the unwinding of the flexible sheet from the transparency, and its rewinding on the spring-actuated roller, thereby releasing the printed paper and its negative, as will be readily apparent, when the device is again ready for the insertion of further work.

As the rotation of the transparency to its lower printing position leaves the space above and about the bridge supporting the lamps free of any obstruction, heat from the lamps is readily dissipated in the surrounding air and there is no objectionable heating of the printing surface which is merely subjected to such negligible heat as may be directly radiated thereto.

The arrangement described may be easily and sturdily constructed without involving excessive weight or expense, and its simplicity of operation renders it capable of effective use by even a most inexperienced operator.

This invention may be developed within the scope of the following claims without departing from the essential features of the said invention and it is desired that the specification and drawing be read as being merely illustrative and not in a strictly limiting sense as to precise design.

What I claim is:

1. In a photographic printing device of the type described, a work table in the form of a semi-cylindrical transparency rotatable about a horizontal axis from a normal upper loading position presenting a convex surface upwardly for initial reception and support of work to a lower printing position, substantially axially disposed illuminating means for said transparency, a flexible sheet attached to the rear edge of said transparency whereby said sheet will progressively encircle said transparency as it is rotated to a lower printing position, for the purpose of maintaining a negative and printing paper in printing position about and beneath said transparency, and biased means engaging the free end of said sheet to withdraw it from contact with the surface of said transparency as said transparency is rotated to its upper loading position.

2. In a photographic printing device of the type described, a work table in the form of a semi-cylindrical transparency rotatable about a horizontal axis from a normal upper loading position presenting its convex surface upwardly for the initial reception and support of work to a lower printing position, substantially axially disposed illuminating means for said transparency, a flexible sheet attached at one end to an edge of said transparency to entrap work placed on said table and hold such work in printing position under the inverted table after said table has been rotated from its work receiving position, and means for tensioning said sheet over the surface of said transparency when said transparency is in its aforesaid lower printing position.

3. In a photographic printing device of the type described, a work table in the form of a semi-cylindrical transparency rotatable about a horizontal axis from a normal upper loading position presenting a convex surface upwardly for the initial reception and support of work to a lower printing position, substantially axially disposed illuminating means for said transparency, a flexible sheet attached at one end to the rear edge of said transparency whereby said sheet will progressively encircle said transparency as it is rotated to a lower printing position for the purpose of maintaining a negative and printing paper in printing position about and beneath said inverted transparency, and biased means attached to the other end of said sheet against the influence of which said sheet is so progressively wrapped about said transparency.

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