Jan. 22, 1935. G. P. HAM 1,988,593

PHOTOGRAPHIC PRINTING MACHINE

Filed July 12, 1933

FIG. 1.

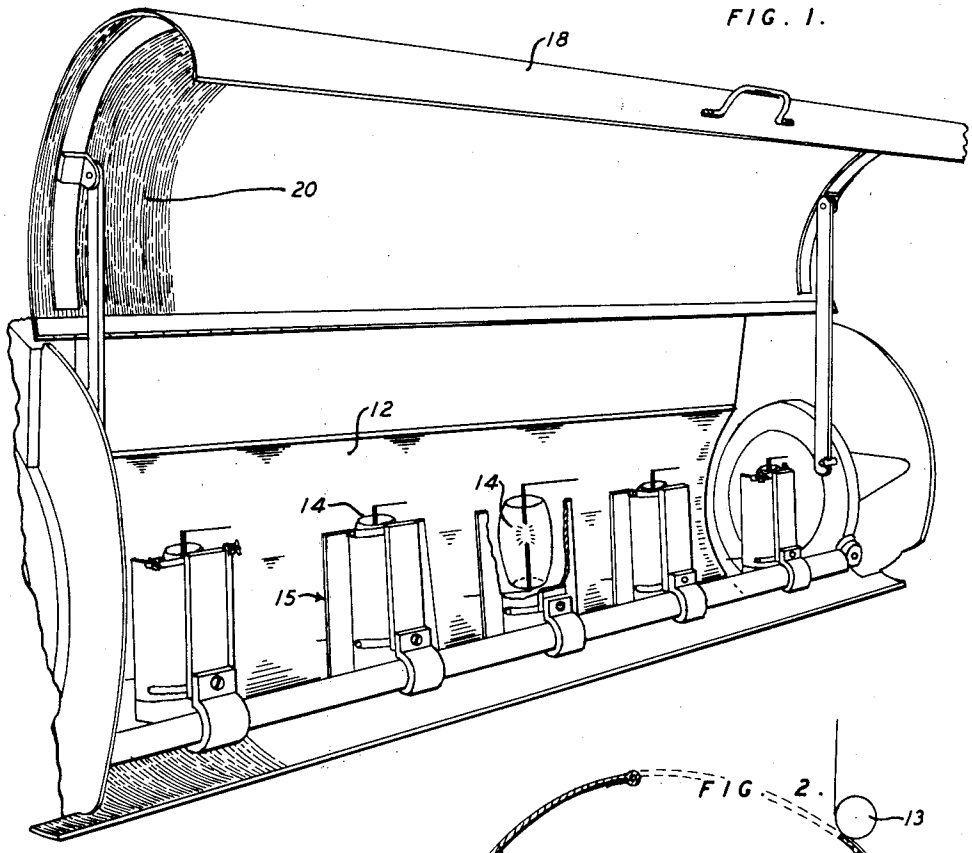


FIG. 2.

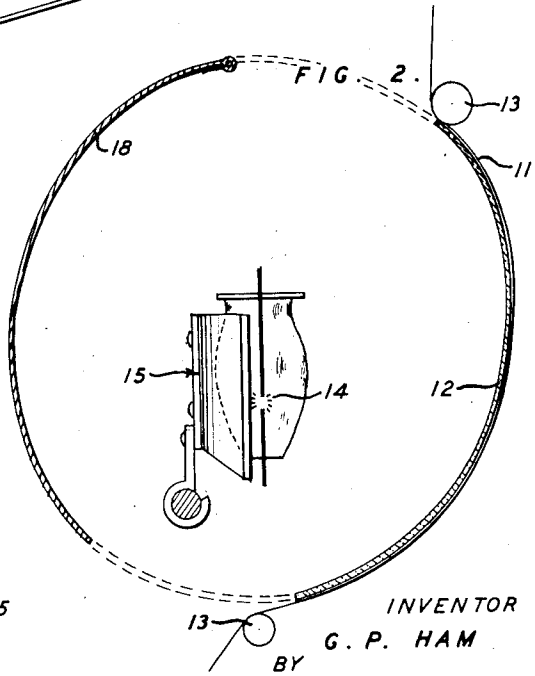


FIG. 3.

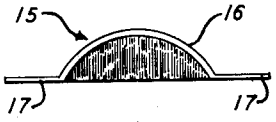
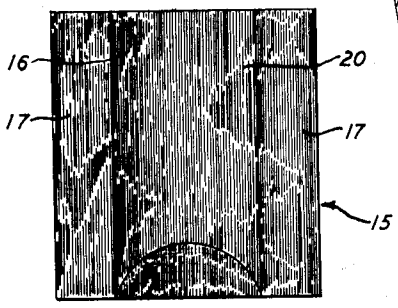


FIG. 4.



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PHOTOGRAPHIC PRINTING MACHINE

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6 Claims. (Cl. 95—77.5)

This invention relates to a system of optical elements and more particularly to a system for reflecting and uniformly distributing light from a source on a predetermined curved area.

An object of the invention is to provide a series of optical elements so related as to produce a uniform distribution of light on a moving predetermined curved surface.

In accordance with a preferred embodiment of the invention herein shown and described, a sheet of blueprint paper and associated negatives are continuously moving at a uniform rate of speed over the outer or convex surface of a curved glass, the surfaces of which are straight in horizontal planes and curved in vertical planes. Several arc lamps are located on the inner or concave surface side of the curved glass to provide the illumination necessary for printing on the blueprint paper. Individual upright reflectors are located in back of the arc lamps and have their reflecting surfaces striated in vertical planes to distribute the light from the lamps evenly over the surface of the curved glass. A concave reflecting hood having the same contour as the curved glass and striated in vertical planes faces the concave surface of the glass to reflect that portion of the light from the arc lamps which does not pass through the curved glass to the paper. This light is reflected back onto the curved glass uniformly over the surface of the glass.

The invention may be better understood by reference to the following detailed description and accompanying drawing in which

Fig. 1 is a perspective view of that portion of the blueprinting machine embodying the invention;

Fig. 2 is a schematic view of the embodiment of the invention shown in Fig. 1, and

Figs. 3 and 4 are views of one of the reflectors employed.

Referring to the drawing which illustrates a preferred embodiment of the invention, blueprint paper 11 and associated negatives (not shown) as they are propelled through the machine by means (not shown) pass over the outer or convex surface of the curved glass 12 which is sometimes called a "hump" glass. The paper 11 and the associated negatives are held in contact with the curved glass 12 throughout its entire height by any suitable means such as the rollers 13. Several arc lamps 14 are arranged in a row on the concave side of the curved glass 12.

Individual reflectors 15 are positioned in the back of each of the arc lamps 14 to throw the light onto the curved glass 12. Each of the reflectors 15 has a central curved portion 16 and straight end portions 17. Each reflector 15 is positioned so that the concave surface of the curved portion 16 is adjacent the arc lamps 14. The reflectors 15 are preferably made of a metal such as aluminum, and the surface of which, facing the glass 12, is striated, the striae running in vertical planes. A satisfactory method of producing the striae consists of scratching the reflectors longitudinally and thereafter etching the scratched surfaces with an acid such as hydrofluoric acid. This method produces a plurality of mirrored surfaces comprising vertically extending grooves and ridges which will uniformly distribute the light from the individual arc lamps to the right and left of the lamps and will not concentrate the light on the glass directly in front of the lamps 14 as might otherwise be the case.

In back of the individual reflectors 15 is a reflecting hood 18. The hood 18 is shown in Fig. 1 in its raised position and in Fig. 2 in its lowered or normal position. The hood 18 preferably has the same contour as that of the curved or "hump" glass 12 and is positioned so that the concave surface faces the concave surface of the glass 12. The inner or concave surface of the hood 18 is preferably a metal such as aluminum and the surface is striated, the striae 20 thereon running in vertical planes. The striae 20 are preferably produced in the manner described above with reference to the individual reflectors 15.

In some continuous blueprinting machines used in the past there is a maximum speed at which the paper can be propelled therethrough, beyond which speed satisfactory results cannot be obtained. It has been found with a system such as shown and described a considerable increase in the speed of blueprint paper can be made and at the same time equal if not superior results can be obtained as compared with machines having unstriated reflectors and unstriated hoods of cylindrical shape when the glass 12 is not cylindrical in shape.

While the single embodiment of the invention has been shown and described in detail, the invention is not to be construed as limited to the particular embodiment shown, since numerous modifications thereof can be made by one skilled in the art without departing from the spirit of applicant's invention, the scope of which is determined in the appended claims.

What is claimed is:

1. In a blueprinting machine, a hump glass

having a concave surface and a convex surface, means for propelling a blue printing paper and associated negatives over the convex surface, a reflector having a concave surface facing the concave surface of said glass, a source of light between said glass and said reflector, the concave surface of said reflector having a plurality of straight parallel striae thereon.

2. In a blueprinting machine, a hump glass having a convex surface and a concave surface, means for moving a blueprinting paper in one direction over the convex surface of said hump glass, a reflector having the same contour as the concave surface of the hump glass with its concave surface facing the concave surface of the hump glass, and a plurality of striae on said reflector for distributing light reaching the reflector evenly over said hump glass in a direction perpendicular to the direction of travel of said paper.

3. In a reproducing device, a curved glass having a convex surface and a concave surface, means for moving a printing paper and associated negatives over the convex surface of said glass, a plurality of light sources arranged in a row on the concave surface side of said glass, individual striated reflectors in back of each of said light sources and a reflector hood having the same contour as the concave surface of the glass in back of the individual reflectors.

4. In a blueprinting machine, a light transmitter, means for propelling an object across the face of said light transmitter on one side of said light transmitter, a reflector facing the other side of said light transmitter and having a plurality of striae thereon for distributing light reaching the reflector evenly over the face on said other side of the light transmitter in a direction perpendicular to that in which the object is propelled.

5. In a blueprinting machine, a light transmitter, means for propelling an object across the face of said light transmitter on one side of the light transmitter, a reflector facing the other side of said light transmitter and having the same contour as the face of the light transmitter which the reflector faces.

6. In a blueprinting machine, a light transmitter, means for propelling an object across the face of said light transmitter on one side of the light transmitter, a reflector facing the other side of said light transmitter and having the same contour as the face of the light transmitter which the reflector faces, and a plurality of striae thereon for distributing light reaching the reflector evenly over said other face in a direction perpendicular to that in which the object is propelled.

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