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P. H. COUTURE

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COPYING APPARATUS

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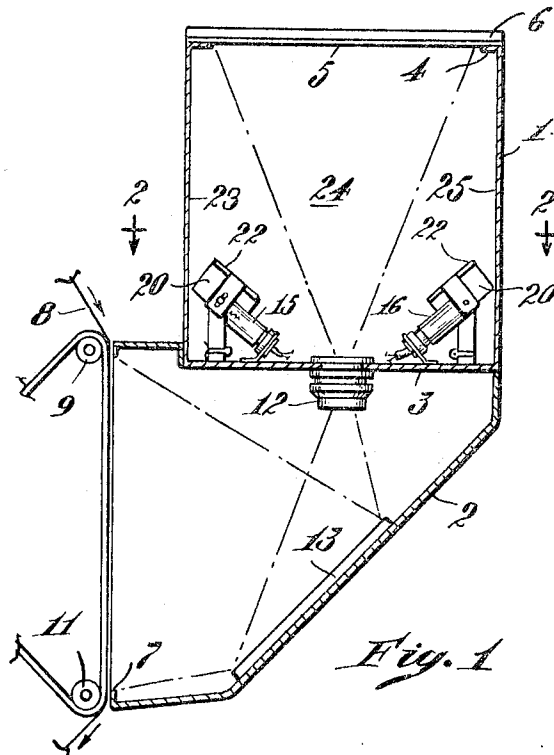
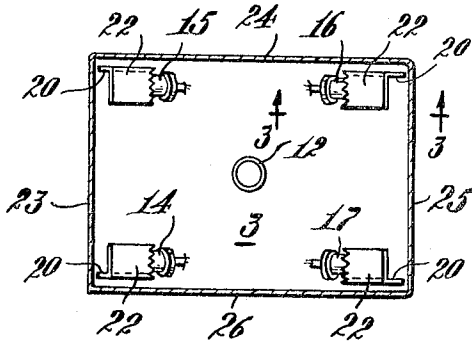
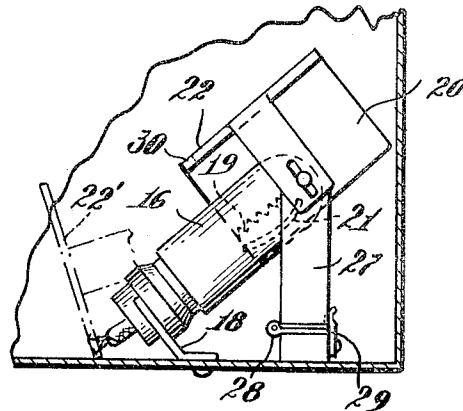
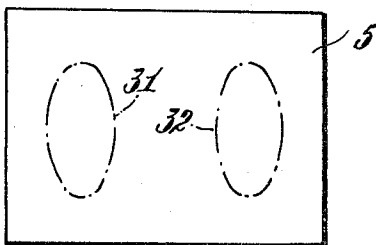


Fig. 3

Fig. 4

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1 Claim. (Cl. 88—24)

This invention relates to apparatus for reproducing a record and particularly to apparatus for forming an electrostatic image on photoconductive paper or the like by projection printing.

Objects of the invention are to provide copying apparatus which is simple and economical to produce, which is compact, which reproduces a record uniformly throughout its entire area, which corrects for lenses having deficient coverage, and which is quickly and easily adjustable.

This invention involves a printer comprising a chamber having a record window to receive a record sheet, and a print window to receive a sheet of photographic material, with a lens between the two windows to focus the record sheet on the photographic sheet, the chamber and windows having corresponding rectangular shapes, in combination with means for illuminating the record sheet including a light source in each of the four corners of the chamber opposite the record window, the sides of the chamber being reflective, and a reflector behind each light source to direct light to the aforesaid sides. Preferably the reflectors direct the light predominantly to the corners of the record sheet, thereby to illuminate the corners more than the central portion of the record sheet, and a baffle is mounted in front of each light source to prevent light from being reflected directly from the record window to the lens.

For the purpose of illustration a typical embodiment of the invention is shown in the accompanying drawing in which

FIG. 1 is a vertical section of the apparatus;

FIG. 2 is a section on line 2—2 of FIG. 1;

FIG. 3 is an enlarged side view of one of the lamp assemblies; and

FIG. 4 is a plan view of the record window showing the uneven illumination which this invention eliminates substantially.

The particular embodiment of the invention chosen for the purpose of illustration comprises a casing having two chambers 1 and 2 with a partition 3 therebetween. In the top of chamber 1 is a record window 4 covered by a transparent plate 5 and a cover 6, and at the side of the chamber 2 is a print window 7 behind which a strip 8 of photoconductive material may be fed over rollers 9 and 11. Mounted in the partition 3 is a projection lens 12 for projecting a record in window 4 to the print window 7, the projected light being reflected by a mirror 13.

According to this invention lamps 14, 15, 16 and 17 are mounted on brackets 18 in each of the four corners of the chamber 1 opposite the record window 4. Each of these lamps is preferably of the well-known projection type, having a concentrated filament 19 and a built-in reflector 21 for reflecting light away from the corner in which the lamp is mounted. In front of each lamp is a baffle 22 for preventing light from being reflected directly from the transparent plate 5 to the lens without being reflected from one of the side walls 23, 24, 25 and 26 of chamber 1 which are made reflective in any suitable way. The reflectors should be specular, that is, mirror-like surfaces, and not diffuse reflectors like painted surfaces. If shiny aluminum foil is used it should be stretched to lie

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flat. As shown in FIG. 1 the axes of the beam from each lamp is directed approximately parallel with the adjacent side wall, the axes of lamps 14 and 17 extending along wall 26 and the axes of lamps 15 and 16 extending along wall 24. Thus the axes of the beams from lamps 14 and 15 intersect wall 25 and the axes of the beams from lamps 16 and 17 intersect the wall 23. Owing to divergence each beam spreads over a considerable surface of the reflective sides so that the illumination of the record window is approximately uniform. For example, light from lamp 15 is reflected strongly from walls 24 and 25, less strongly from wall 26 and not at all from wall 23. By aiming the beams toward the corners of chamber 1 as aforesaid, the corners of the record window may be illuminated somewhat more than the central portion, the illumination gradually decreasing toward the center, thereby to compensate for usual lens deficiencies.

As shown in FIG. 3 the baffles 22 may be adjustably mounted on supports 27 which are hinged at 28 to swing to the dotted-line position 22' to facilitate adjustment and replacement of the lamps, the supports being held in upright position by spring detents 29. The baffles are adjusted to prevent specular reflections from entering the print window, but may allow as much as about twenty-five percent of the light to shine directly on the windows at their corners in order to obtain increased illumination at the corners as aforesaid. Inasmuch as the baffles tend to cast shadows on the window 4 and to get evenness of illumination, the edges of the shadows should be diffuse. This may be accomplished by placing the baffles close to the lamps or making the edges of the baffles saw-toothed, as indicated at 30 in FIG. 2, or both.

According to this invention each baffle has a wing 20 on the side next to the adjacent wall 23, 24, 25 or 26 of the chamber 1 to screen each lamp from its adjacent wall. Without these wings the illumination of the window 4 is not entirely uniform, elliptical bright spots 31 and 32 appearing as shown in FIG. 4. By adding wings 20 these spots are substantially eliminated.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claim.

I claim:

For printing a sheet of photographic material from a record sheet, a printer comprising a chamber having a record window to receive a record sheet, a print window to receive a sheet of photographic material, a lens between the two windows to focus the record sheet on the photographic sheet, said chamber and windows having corresponding rectangular shapes, means for illuminating the record sheet including a light source in each of the four corners of said chamber opposite the record window, a baffle in front of each light source to prevent light from being reflected directly from the record window to the lens, the sides of said chamber being reflective, and a reflector behind each light source, each reflector being directed toward an opposite side of said chamber adjacent the record window, characterized in that each baffle has a wing on the side next to the adjacent wall of said chamber to screen each lamp from its adjacent wall.

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