Feb. 4, 1964 A. GITTLER 3,120,163

PRINTING DEVICE

Filed April 20, 1961

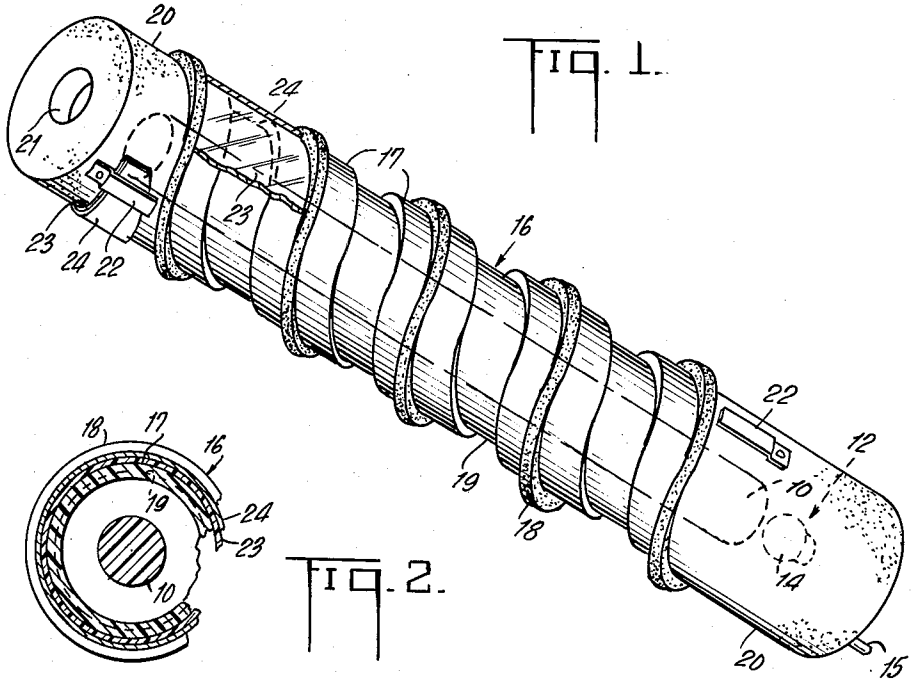


FIG. 1.

FIG. 2.

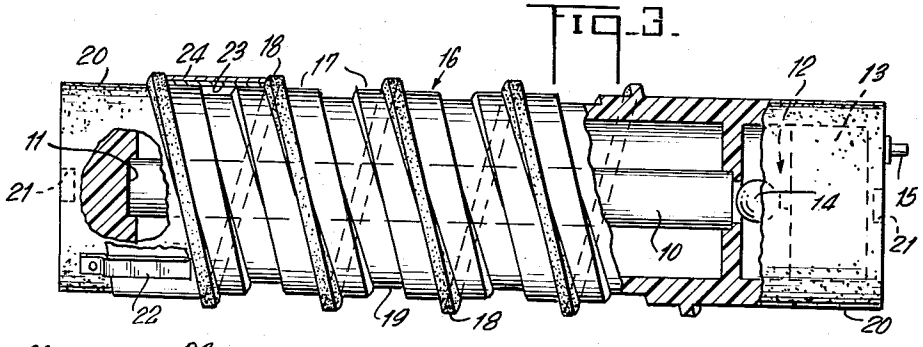


FIG. 3.

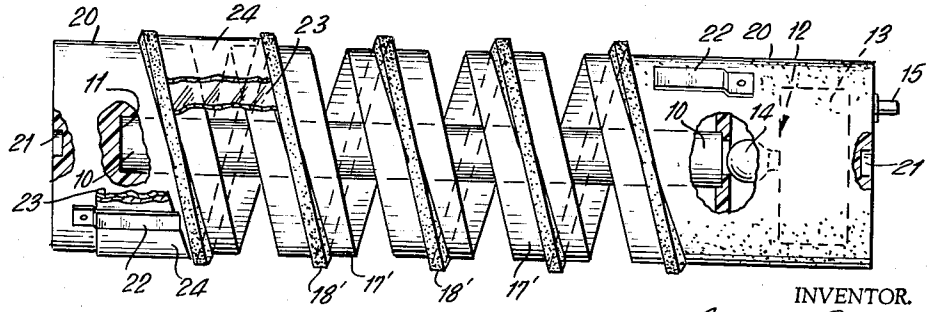


FIG. 4.

INVENTOR.
ALLAN GITTLER

BY

Albert D. Jacobs

ATTORNEY

United States Patent Office 3,120,163 Patented Feb. 4, 1964

3,120,163

PRINTING DEVICE

Allan Gittler, 17 E. 82nd St., New York, N.Y.

Filed Apr. 20, 1961, Ser. No. 104,448
7 Claims. (Cl. 95—75)

The present invention relates to printing devices and, more particularly, to a printing device which makes it possible to print simultaneously all the pictures on a length or strip of material to be photographically copied such as, for example, a 35 mm. roll film.

It has been the usual practice in the past to develop a roll or strip of film which has been exposed to take a number of pictures and then to make individual prints or transparencies by severing the negative strip and processing each picture area separately and, so far as I am aware, it has not been possible in a simple and practical manner to print all such pictures simultaneously. The object of the present invention is to make this possible for the first time and to provide a simple and effective printing device for such purpose.

Another object of the invention is to provide a helical track or a cylinder having such a track formed in the surface thereof on which the material to be photographically copied can be wound and temporarily held in position thereon and upon which sensitized paper or film can be superimposed for simultaneous exposure to produce the photographic copies.

It is a further object of the invention to provide such a device wherein a length or strip of photographic negative is helically wound on its support and temporarily held in position until printing is complete therefrom while also avoiding direct contact of the picture areas of the negative with the printing device and yet further making it possible to print marginal indicia appearing on the negative and all in a dust-free manner due to the lack of contact of the picture areas with the printing device and so carried out that light from one convolution of the helix cannot have access to the next from the rear of the negative or from above. Other and further objects and advantages will be apparent or described hereinafter.

The invention is illustrated in the accompanying drawing in which:

FIG. 1 is a prospective view of a printing device responding to the invention; FIG. 2 is a transverse sectional view taken through FIG. 1; FIG. 3 is an elevational view of the device of FIG. 1; and FIG. 4 is a view similar to FIG. 3 of a modified form of device.

According to the present invention, I utilize a Lucite rod 10 or a rod of other or similar material which is capable of conducting and transmitting light. It is known that a rod of Lucite is capable of conducting light along its length and of giving off in outwardly radial directions soft or diffused light. At one end surface of the rod 10 a white paint, aluminum or other reflective coating 11 is provided to form a reflector for the light supplied from the light source 12 adjacent the opposite end of rod 10. Light source 12 is composed of battery pack 13 containing one or more pencil batteries—which are dry cells—held together by clips in known manner and the battery pack has a bulb 14 which screws into the battery pack in any known or suitable manner and which can be renewed as required. The battery pack is also provided with a switch 15 of any suitable or known nature to enable the bulb to be illuminated or turned off as required. A light source timer can also be provided to give exposure for a predetermined time—depending on the emulsion used.

Around the rod 10 and uniformly spaced therefrom is a transparent or translucent plastic cylinder 16 through which rod 10 extends axially and in which it is mounted. Cylinder 16 may be composed of any known synthetic plastic material which is transparent or which is translucent and may, for example, be made of polyethylene or polystyrene. Cylinder 16 has formed in its surface a helical track 17 and centrally of such track there is a raised rib 18 which is opaque to light and which therefore prevents rear fogging of the emulsion used. The opacity may be obtained by painting or coating the rib with black paint or any other material which blocks the undesired transfer of light rays. The successive convolutions of track 17 are interconnected by a depressed trough or web 19 which also extends helically around the cylinder. At each end of the cylinder there is a cap-like portion 20 which is also preferably painted black or otherwise rendered opaque to light for a short distance in an inward direction from the termini of the cylinder. In the outside end surface of each cap end is a small depression or recess 21 arranged to receive a trunnion or pin on each end of a U-shaped bracket (not illustrated) so that the entire device is rotatable to facilitate mounting of the negative and film. The cap portions of the cylinder are also provided with clip or clamp means 22 by which the negative 23 is temporarily held in position after being wound helically on said cylinder and the clip or clamp means 22 are also so constructed as to hold in position a length or strip of sensitized paper or film 24 which is wound upon the negative. The sensitized paper becomes the positive made from the negative and the film produces a series of transparencies, either in black and white or in color.

It will be observed that when the negative is wound helically on track 17, only the edges of the negative are in contact with the track and the picture areas of the negative are above the trough 19 and spaced from and out of contact with all parts of the cylinder so that no problem arises as to the accumulation of dust or scratches or to imperfections which would produce defective positives or transparencies. It will further be observed, since light for printing purposes passes radially outwardly along the entire length of rod 10, that all picture areas of the negative can be printed simultaneously in one simple operation. It will further be appreciated that marginal indicia on the strip of negative will be reproduced in the positive or transparency since light passes from rod 10 through track 17. It is clear, of course, that light also passes from rod 10 through helical trough 19 to bring about printing of the picture areas and yet without such picture areas being in contact with the material of the cylinder except along the tracks 17. As already explained, the opaque helical rib 18 prevents fogging, thus avoiding spoilage by extraneous or undesired light rays which would result in imperfect positives or transparencies. The sensitized paper or other pellicle is wound upon the cylinder and superimposed on the negative which is already in place and the sensitized paper or pellicle is also temporarily held in position by said means 22 in order to avoid displacement of the two strips relatively to one another in a longitudinal direction along the length of the strips. The opaque rib 18 further serves to prevent relative lateral movement between the negative and the positive or transparency stock.

In the modified form of the invention shown in FIG. 4, the construction is essentially the same, as will be appreciated from the use of the same numerals for corresponding parts, but in FIG. 4, instead of having a continuous cylinder, the helical track 17' is made up of a series of separate but continuous convolutions similar to a spring so that there is free space between successive convolutions of the helix. As before, there is an opaque raised helical rib 18' which serves the purpose already described in connection with the form of the invention of FIGS. 1 to 3. The helix of FIG. 4 is likewise transparent or translucent but is preferably made of stronger or heavier gauge material so that, although springlike in nature, there is no appreciable distortion of or relative movement between

successive convolutions of the helix. The modification of FIG. 4 has the advantage of being less expensive and simpler to make and assemble and of requiring less material but the preferred form of the invention and the best mode of carrying out the invention now known to me is that of FIGS. 1 to 3.

The operation and use of the device will be clear from the foregoing but it is pointed out that, if desired or preferred, the entire operation may be carried out in a light-tight box provided with access sleeves, making it useful in the fields or in a dark room or in an enclosure having only at most very subdued light. It is further apparent that various details of the printing device may be changed without departing from the invention as defined by the appended claims. The light source which has been used is a #222 GE flashlight bulb and the pencil batteries in the battery pack are readily available on the open market. The switch is of known construction as used in flashlights.

A variety of effects can be achieved by the invention both in black and white and in color. In black and white, I can proceed from a negative to a positive, from a positive to a duplicate negative as well as reversal flashing. In color, I can proceed from a negative to a positive, from a positive to a duplicate negative as well as reversal flashing. I can, moreover, produce a black and white positive from a color negative. In addition to the usual uses, I can obtain special effects such as overlays, titles and mattes.

What is claimed is:

1. A printing device comprising a rod of light conducting and transmitting material, a source of light adjacent one end thereof and a coating reflective to light on the other end thereof, a helical track around and uniformly spaced from said rod, said helical track serving as a support for the edge portions of a photographic negative to be wound thereon and having an opaque helical ridge to prevent fogging, means for holding the rod and helical track in fixed relationship to one another and means for temporarily securing in position a length of photographic material for printing therefrom.

2. A printing device according to claim 1, in which the helix is formed as a part of a light permeable cylinder of

plastic material through which the rod passes axially and in which it is mounted.

3. A printing device according to claim 1, in which the rod is composed of Lucite.

4. A printing device according to claim 3, in which the light source is a battery pack with an electric light bulb directing light rays into the adjacent end of the Lucite rod.

5. A printing device according to claim 1, in which the successive convolutions of the helical track are separate and spaced from one another and the track supports the photographic negative along its edges only.

6. A printing device according to claim 2, in which the portions of the light-permeable cylinder between the negative-supporting track areas are interconnected by a depressed trough-like helix which is out of contact with the photographic material.

7. A printing device for printing from a strip of helically wound photographic material all pictures thereon simultaneously which comprises a light-permeable plastic cylinder the end portions of which are coated to make them opaque to light, said cylinder between its coated end portions having formed therein a helix constituting a track for supporting the edges of the photographic negative to be wound thereover, said track having a central raised rib which is opaque to light, said convolutions being interconnected by a depressed trough-like helix underlying the picture area on the material which are to be reproduced, an axial Lucite rod mounted in and extending through the cylinder, a reflective coating on one end surface of said rod and a light source disposed adjacent the opposite end of said rod, said cylinder being provided with means for temporarily holding in place the material to be photographically copied.

References Cited in the file of this patent

UNITED STATES PATENTS

1,092,490	Kitsee	Apr. 7, 1914
2,247,258	Shepard	June 24, 1941
2,368,839	Jansen	Feb. 6, 1945
2,530,734	Salzman	Nov. 21, 1950
2,665,187	Kinley	Jan. 5, 1954