

Sept. 29, 1953

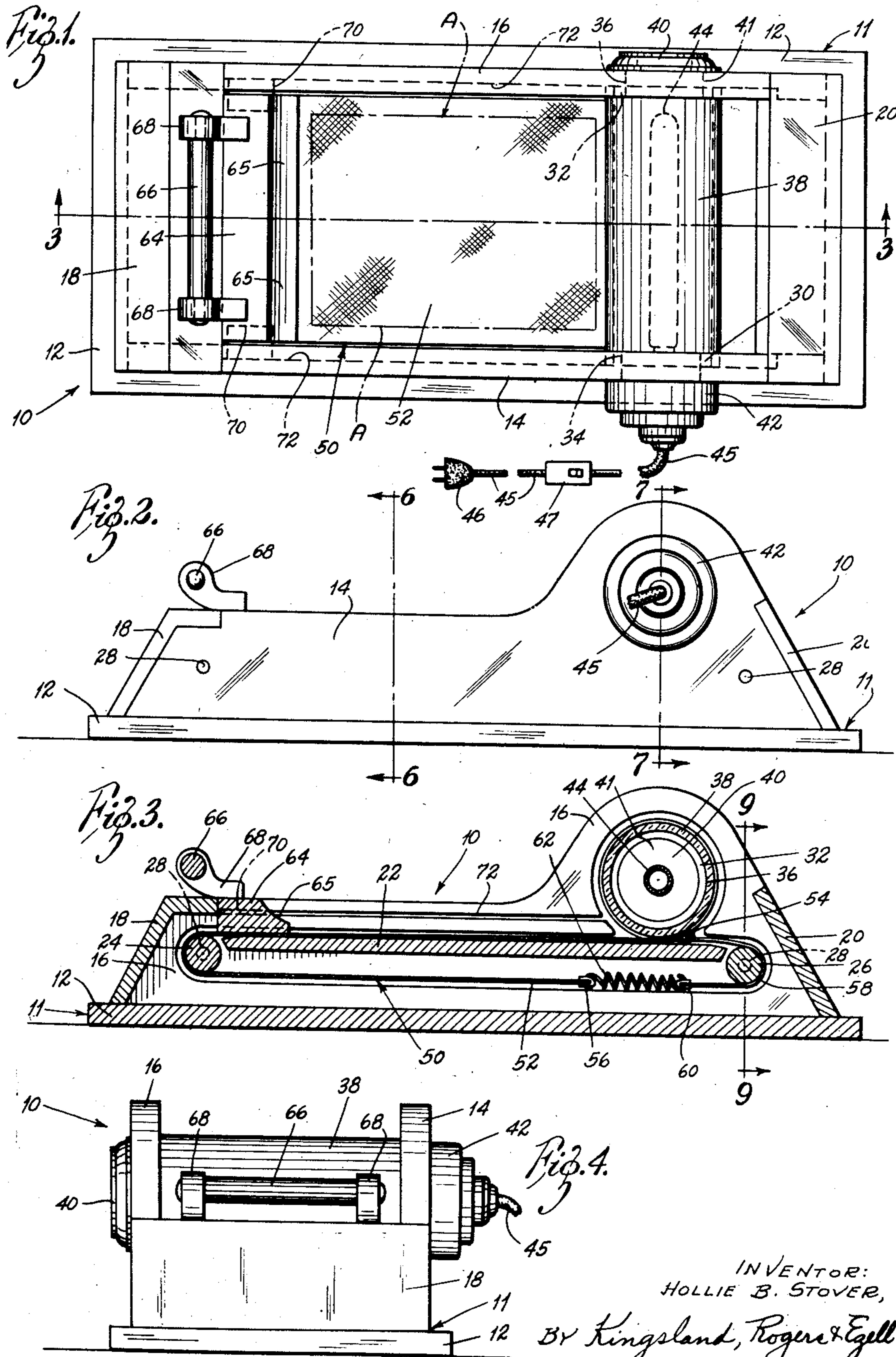
H. B. STOVER

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CYLINDRICAL CONTACT PRINTER

Filed June 18, 1947

2 Sheets-Sheet 1



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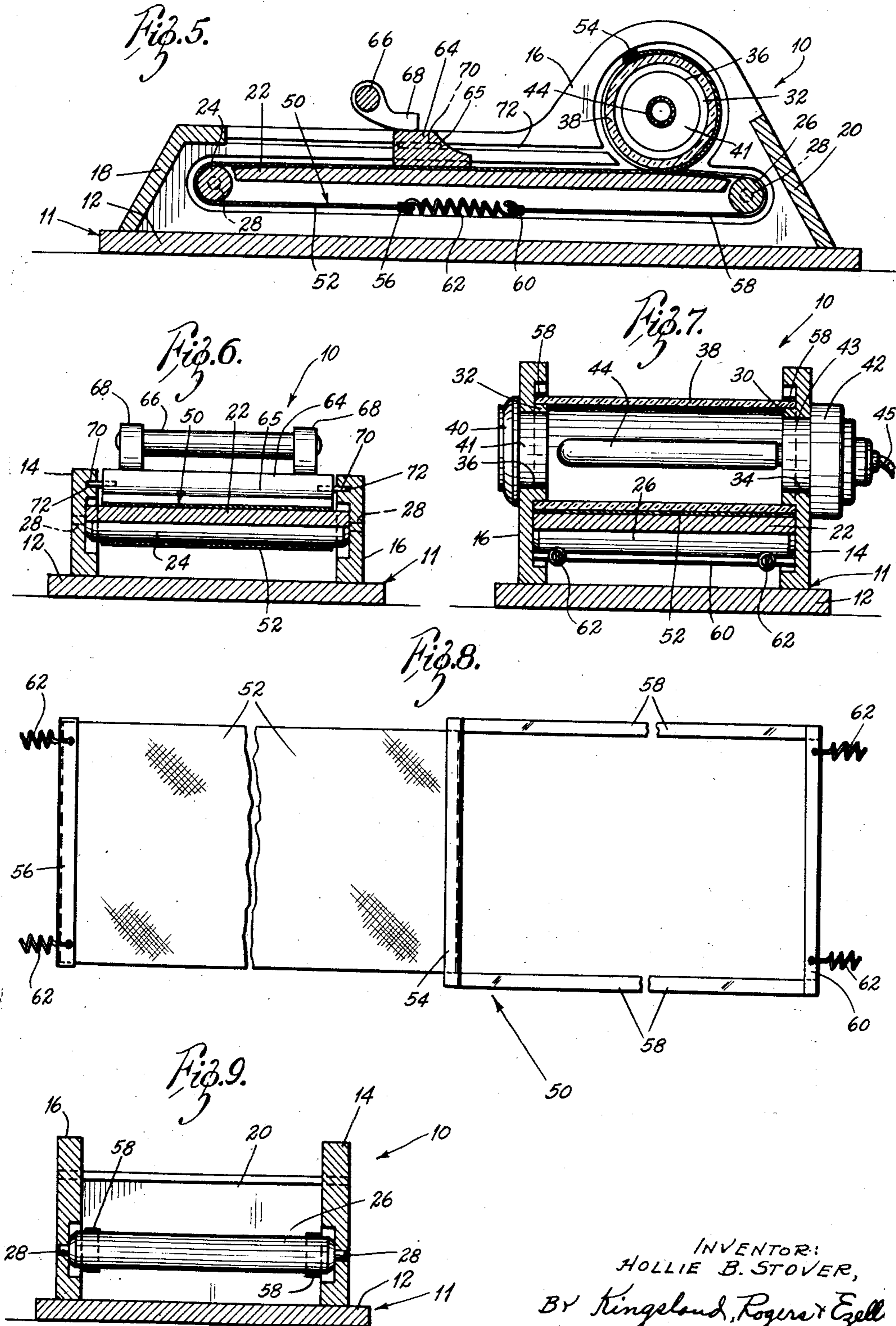
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UNITED STATES PATENT OFFICE

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CYLINDRICAL CONTACT PRINTER

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8 Claims. (Cl. 95—77.5)

1

The present invention relates generally to reproduction devices, and more particularly to contact printing devices for rapidly reproducing prints from negatives of various types. It is understood that the word negative, singular or plural, includes any flexible photographic negative, positive picture, drawing, or tracing from which it may be desired to make or reproduce prints.

An object of the present invention is to provide a novel contact printing device which is particularly adapted for reproducing prints from negatives at a rapid rate and in an efficient manner.

Another object is to provide a novel contact printing device by which negatives, in contact with sensitized paper, or the like, may be readily and quickly moved into position for exposure to light and as quickly and readily returned to the initial starting position for removal of the completed print.

Another object is to provide a novel contact printing device which is simple to operate to achieve excellent prints.

Another object is to provide a novel contact printing device in which the light source is radially unobstructed, thereby being effective for printing through three hundred and sixty degrees.

Other objects are to provide a novel contact printing device which is simple in construction, which is durable, and, hence, requires very little replacement of the few moving elements, and which may be employed with high efficiency by an amateur in the printing art with minimum instruction.

The foregoing and other objects and advantages are apparent from the following description taken with the accompanying drawings, in which:

Fig. 1 is a plan view of a contact printing device incorporating the teachings of the present invention;

Fig. 2 is a side elevational view thereof;

Fig. 3 is a vertical longitudinal cross-sectional view on substantially the line 3—3 of Fig. 1;

Fig. 4 is an end elevational view thereof looking from the left in Fig. 2;

Fig. 5 is a cross-sectional view similar to Fig. 3 with the conveyer disposed intermediate the two extreme positions of movement thereof;

Fig. 6 is a transverse vertical cross-sectional view on substantially the line 6—6 of Fig. 2;

Fig. 7 is a transverse cross-sectional view on substantially the line 7—7 of Fig. 2;

Fig. 8 is a plan view of the contact web, tension bands and springs, illustrating the continuous re-

2

lation of the elements, the springs being broken into halves for purposes of the present illustration; and

Fig. 9 is a transverse vertical cross-sectional view on substantially the line 9—9 of Fig. 3.

Referring to the drawings more particularly by reference numerals, 10 indicates generally a contact printing device incorporating the concepts of the present invention. The printing device 10 includes a frame 11 comprising a base 12, side panels 14 and 16, and end panels 18 and 20, which are assembled as shown.

A bed plate 22 is supported by the side panels 14 and 16 intermediate the end panels 18 and 20, as is clear from Figs. 3 and 6. Rollers 24 and 26 are also supported by the side panels 14 and 16 through suitable pintles 28 having bearing in openings therein (Fig. 9). The rollers 24 and 26 are located at the ends of the bed plate 22.

The side panels 14 and 16 are formed with annular opposed bosses 30 and 32, respectively, which surround openings 34 and 36, respectively (Fig. 7). The bosses 30 and 32 support a transparent cylinder 38. The opening 36 is closed by a cap 40, the hub 41 of which frictionally engages the walls of the opening 36. The cap 40 may be hinged and provided with a suitable catch or lock. An electric light socket construction 42 extends into and is supported in the opening 34, being frictionally maintained in position by the hub 43. An elongated electric light bulb 44 free of radial obstructions is supported in the socket construction 42 and extends into the cylinder 38. Several such bulbs may be employed if desired. A power cord 45 is shown leading from the socket construction 42, a suitable plug 46 being connected to the free end thereof. A switch 47 is provided for controlling the bulb 44. While the bulb 44 shown is supported from one end, a light tube or tubes supported at both ends, as a fluorescent or quartz tube or bulb, may be used, in which case the cap 40 will be formed as a socket.

A conveyer 50 is provided for reception of sensitive paper, or the like, and a negative, and for moving the same into and out of encircling position about the cylinder 38. The conveyer 50 includes a tension web 52 to the ends of which are secured upper and lower cleats 54 and 56, the upper cleat 54 extending beyond the sides of the tension web 52, as is clear from Fig. 8. The cleats 54 and 56 are shown as metal strips folded along a longitudinal center line to clamp the ends of the tension web 52 between the thus provided opposing sides. To the outer ends of the cleat 54 are connected tension bands 58. A cleat 60 is secured to the other ends of the ten-

sion bands 58. Two spaced tension springs 62 are secured to the cleat 56 and to the cleat 60, as is clear from Figs. 3 and 8. It is to be observed that the space between the tension bands 58 is sufficient to permit passage therethrough of the tension web 52. A push-pull operating cleat 64, including a handle bar 66 mounted on brackets 68, is cemented, or otherwise secured, to the tension web 52 for manipulation of the conveyer 50. A guide wing 70 is secured to each end of the push-pull cleat 64 and slides in a groove 72 provided below the top edge of each side panel 14 and 16, as is clear from Figs. 5 and 6. The upper edge of the end panel 18 serves as a stop to limit movement of the cleat 64 to the left (Fig. 3), and the cylinder 38 to the right, the cleat 64 having an arcuate side 65 for engaging the cylinder 38.

The conveyer 50 is disposed about the rollers 24 and 26, across the bed plate 22, and around the cylindrical member 38, in the manner clearly shown in the drawings. Considering Figs. 1, 3 and 7, the tension web is trained about the roller 24 so that something over half of the length thereof is disposed on the bed plate 22, the remaining portion being disposed beneath the bed plate 22. The upper cleat 54 is disposed beneath the cylinder 38. The tension bands 58 extend from the cleat 54 and are trained around nearly the full circumference of the cylinder 38 adjacent the ends thereof and are then trained about the roller 26, the free ends thereof being connected by means of the cleat 60 and the springs 62 to the lower cleat 56 secured to the tension web 52. It is clear, therefore, that the tension web 52 is, in effect, looped through the tension bands 58.

The switch 47 provided in the power cord 46 may be replaced by a suitable switch attached to the frame and connected into the socket construction 42, such optional switch being manually or automatically actuatable.

Operation

The starting position of the conveyer 50 is shown in Figs. 1 and 3. A length of tension web 52 is disposed on the bed plate 22. With the conveyer 50 in this relation, a piece of sensitized paper, such as is indicated in Fig. 1 by A, may be disposed on the tension web 52 and a negative superposed thereover. The negative may be held in place by suitable removable adhesive strip segments, or the like, if desired. The push-pull cleat 64 is moved to the right until it contacts the cylinder 38 as a stop. In this movement of the cleat 64, the portion of the tension web 52 upon which the negative and sensitized paper A are disposed will be moved into encircling position in respect to the cylinder 38. The tension bands 58 will unwind from the positions shown in Figs. 3 and 7 and will move to positions beneath the bed plate 22, being trained about the roller 26. Thereupon, the electric bulb 44 is energized and deenergized through actuation of the switch 47, the light exposure period being determined by the usual known factors of photographic printing, and the like. For camera negatives, the exposure period is only a fraction of a second when the electric light bulb 44 is of medium wattage. After exposure the push-pull cleat 64 is moved to the left whereby the conveyer 50 is returned to its starting position and the negative and print are removed.

It is manifest from the foregoing that the printing operation requires only a very small interval of time, even where the manual switch 47 is employed. The operation is even quicker when a switch automatically actuated by the cleat 64 or other element of the conveyer 50 is employed.

The simplicity of the device 10 and the operation thereof are obvious. A compact package is provided in the instant device 10 which gets away from the complex constructions heretofore available for contact printing.

It is apparent that there has been provided a contact printing device which fulfills all the objects and advantages sought therefor.

It is to be understood that the foregoing description and the accompanying drawings have been given by way of illustration and example. It is also to be understood that changes in form of the several parts, substitution of equivalent elements and rearrangement of parts, which will be readily apparent to one skilled in the art, are contemplated as within the scope of the present invention, which is limited only by the claims which follow.

I claim:

1. A contact printing device comprising a frame, a light source supported thereby, a transparent cylinder surrounding said light source and supported by said frame, and an endless conveyer supported by said frame and looped around said cylinder, said conveyer including a length of webbing and a pair of laterally spaced tension bands, said bands being connected directly to said webbing at one end thereof and to the other end by tension springs, said webbing and said bands being criss-crossed and being alternately movable into and out of cylinder encircling position, said bands being spaced to permit movement of the webbing therethrough.

2. A contact printing device comprising a frame, a light source supported thereby including an elongated light envelope free of radial obstructions, a transparent cylinder surrounding said light source and supported by said frame, and an endless conveyer supported by said frame and looped around said cylinder, said conveyer including a length of webbing and a pair of laterally spaced tension bands, said bands being connected directly to said webbing at one end thereof and to the other end by tension springs, said webbing and said bands being criss-crossed and being alternately movable into and out of cylinder encircling position, said bands being spaced to permit movement of the webbing therethrough.

3. A contact printing device comprising a frame, a transparent cylinder mounted on the frame, spaced rollers rotatably mounted on the frame below the cylinder, and an endless flexible belt encircling the cylinder for the full three hundred and sixty degrees thereof and trained around rollers, a portion of said belt being formed to permit another portion thereof to pass there-through in leaving or in initial contact with said cylinder.

4. A contact printing device comprising a frame, a transparent cylinder mounted on the frame, spaced rollers rotatably mounted on the frame below the cylinder, an endless flexible belt encircling the cylinder for the full three hundred and sixty degrees thereof and trained around rollers, a portion of said belt being formed to permit another portion thereof to pass there-through in leaving or in initial contact with said

5

cylinder, and means for moving the belt around said cylinder.

5. A contact printing device comprising a frame, a transparent cylinder mounted on the frame, spaced rollers rotatably mounted on the frame below the cylinder, an endless flexible belt encircling the cylinder for the full three hundred and sixty degrees thereof and trained around rollers, a portion of said belt being formed to permit another portion thereof to pass there-through in leaving or in initial contact with said cylinder, a flat support between the rollers, and means for moving the belt over the support and around the cylinder.

6. A contact printing device comprising a frame, a light source supported thereby, a transparent cylinder surrounding said light source and supported by said frame, and an endless conveyor supported by said frame and looped around said cylinder, said conveyor including a length of webbing and a pair of laterally spaced tension bands, said bands being connected directly to said webbing at one end thereof and to the other end by tension springs, said webbing and said bands being criss-crossed and being alternately movable into and out of cylinder encircling position, the space between said bands being greater than the width of the webbing.

7. An apparatus for exposing flexible sheet materials in photographic contact printing, comprising a hollow cylinder of light-pervious material, a light source within the cylinder and a flexible sheet for applying said sheet materials to the surface of the cylinder for exposure, said flexible applying sheet being of a length sufficient to encircle the cylinder and being connected with a lengthening extension in the form of spaced flexible drawing members located on either side of the body of the sheet, the interconnected sheet and extension passing about the cylinder as a loop thereon from which portions of said sheet and said extension, respectively, extend in opposite directions so that they cross each other adjacent the cylinder with the sheet passing between the spaced drawing member, said drawing members being connected with both ends of said sheet so that the sheet and the drawing members together constitute an endless belt.

6

8. An apparatus for exposing flexible sheet materials in photographic contact printing, comprising a light-pervious cylinder, a light source within the cylinder on its axis, spaced horizontal rollers below and parallel to the axis of the cylinder, one roller back of the cylinder and another spaced in front thereof, a flexible applying sheet of a length sufficient to substantially encircle the cylinder and having a lengthening extension connected with the ends of the sheet to form therewith an endless belt member, said extension comprising spaced flexible drawing members located on either side of the body of the sheet, said belt member passing about the cylinder as a loop thereon from which portions of the sheet and the drawing members, respectively, extend in opposite directions in crossed relationship at the lower side of the cylinder with the sheet passing forward through space between the drawing members, the extending portions of said sheet and said drawing members leading to and over said front and said back rollers, respectively, and then together beneath said rollers, the sheet portion extending between the cylinder and said front roller constituting a table surface for receiving sheet materials to be applied to and exposed on the cylinder, said drawing members comprising elastic portions holding the belt member on the cylinder and the rollers under tension.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
35 1,595,534	Wonner -----	Aug. 10, 1926
2,024,678	Brunk -----	Dec. 17, 1935
2,260,486	Schmeck -----	Oct. 28, 1941
2,290,478	Matlas -----	July 21, 1942
2,320,334	Bates -----	June 1, 1943
40 2,402,929	Sutherland -----	June 25, 1946

FOREIGN PATENTS

Number	Country	Date
194,524	Great Britain -----	Mar. 15, 1923
45 231,309	Germany -----	Feb. 20, 1911
253,732	Germany -----	Nov. 14, 1912