May 26, 1931. J. J. RISDON 1,807,047

METHOD AND APPARATUS FOR MAKING PHOTOGRAPHIC PRINTS

Filed Sept. 20, 1927 2 Sheets-Sheet 1

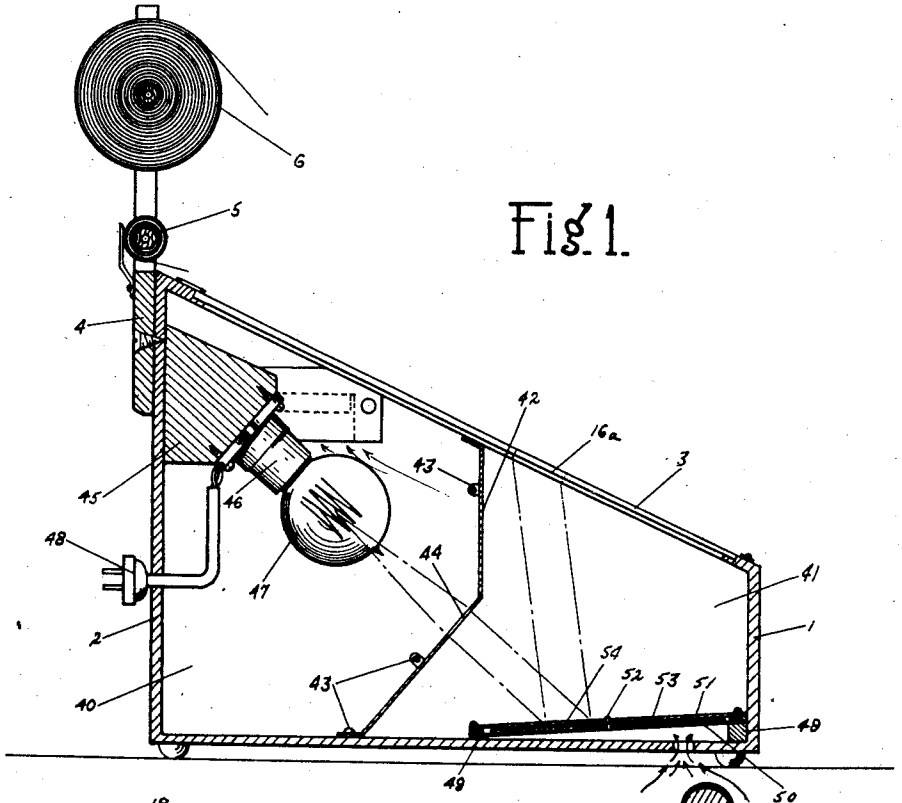


Fig. 1.

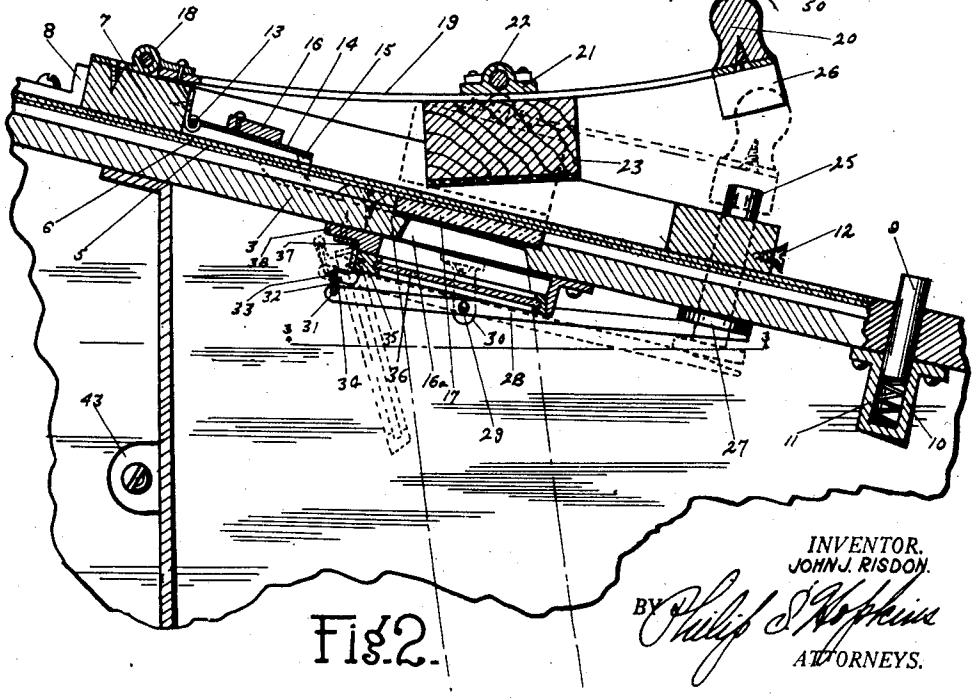


Fig. 2.

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Filed Sept. 20, 1927. 2 Sheets-Sheet 2

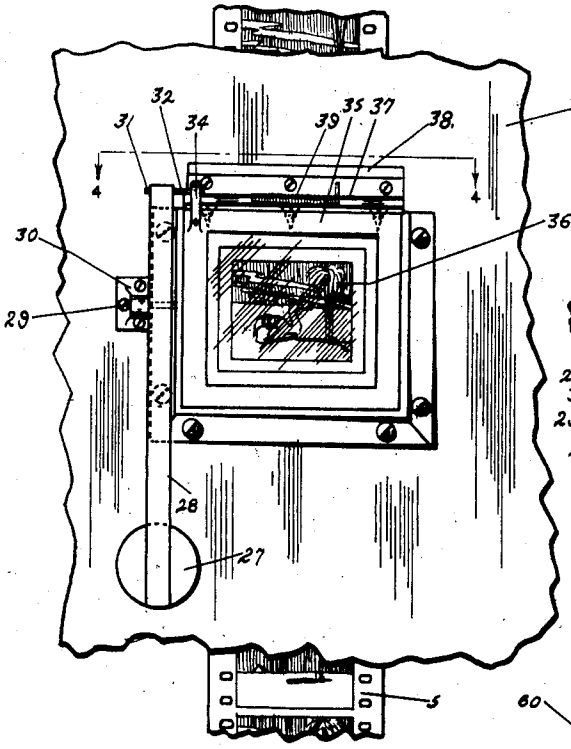


Fig.3.

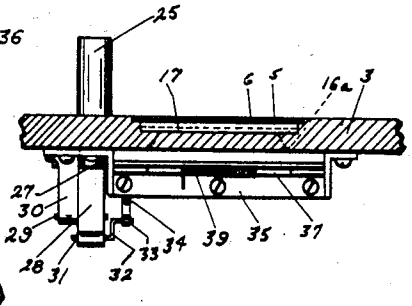


Fig.4.

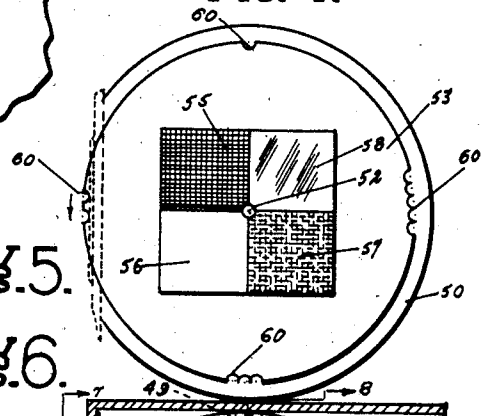


Fig.5.

Fig.6.

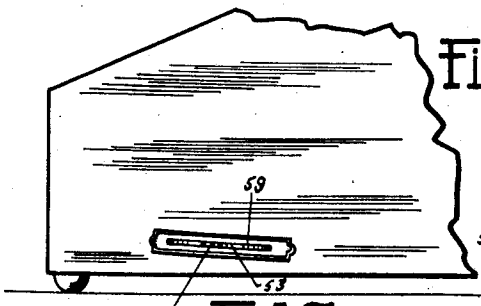


Fig.7.

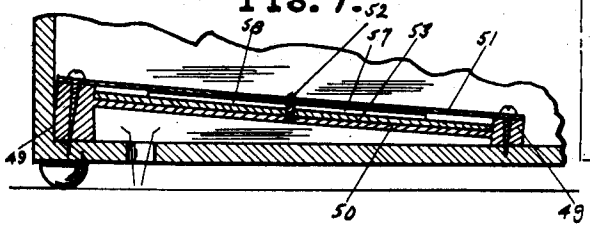
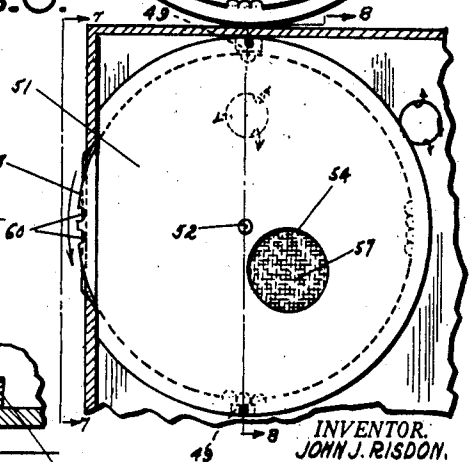


Fig.8.



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UNITED STATES PATENT OFFICE

JOHN J. RISDON, OF BINGHAMTON, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO AGFA ANSCO CORPORATION, OF BINGHAMTON, NEW YORK, A CORPORATION OF NEW YORK

METHOD AND APPARATUS FOR MAKING PHOTOGRAPHIC PRINTS

Application filed September 20, 1927. Serial No. 220,768.

My invention relates generally to the art of making photographic positive prints from negative images and has particular reference to the light control for such printing.

My invention is particularly useful in connection with that type of printing apparatus wherein a strip of positive images may be printed from a strip of negative film, although my invention is not limited to such particular apparatus as it is clearly adaptable to a wide variety of applications, in fact to any type of printing apparatus wherein positives are printed from negatives.

One of the principal objects of my invention is to provide a printing apparatus wherein a single source of illumination is used, the same acting during exposure as the printing light and between exposures as the "safe" light, this source being a white light, continuously illuminated and of constant intensity,

Another important object of my invention lies in the means and method of utilizing the reflected rays of the light source as the printing light.

Still another highly important object of my invention includes the provision of a method and means for controlling the reflected printing light whereby to compensate for negatives of various degrees of density or contrast.

A further object of my invention is to provide a novel form of exposure control.

Many other detailed objects and advantages in construction and operation will be apparent as the description proceeds, reference now being had to the figures of the accompanying drawings wherein like reference numerals indicate like parts.

In the drawings:

Figure 1 is a cross sectional side view of a printer embodying my invention, certain parts being omitted for clearness.

Figure 2 is a detailed cross sectional view illustrating certain elements of my invention.

Figure 3 is a detailed bottom plan view taken on the line 3—3 of Figure 2.

Figure 4 is a detailed sectional view taken on the line 4—4 of Figure 3.

Figure 5 is a detailed plan view of the light control device.

Figure 6 is a detailed plan view of the assembly of such light control device.

Figure 7 is a side view taken on the line 7—7 of Figure 6.

Figure 8 is a detailed cross section taken on the line 8—8 of Figure 6.

Although I have illustrated and will describe my invention as applied to one particular type of printer, it will be obvious as the description proceeds that the same is equally applicable to other types as well.

Referring now to Figures 1 and 2, a casing 1 is provided, having a back wall 2 and a sloping top wall 3. Projecting upwardly from the back 3 is a bracket 4 on the upper end of which may be suitably mounted a roll of negative film 5 bearing developed negative images and a roll of sensitized positive material 6 upon which is to be printed the negative images from the film 5.

Suitably mounted on the sloping top wall 3 of the casing, as by tongue and groove connection, (not shown) is the slide member 7 adapted to be reciprocated on the top 3 between the upper stop member 8 and the lower stop member 9. The lower stop member 9 is, as shown clearly in Figure 2, movable downwardly into the cup 10 secured to the underside of top 3 against the tension of coil spring 11 which normally urges the stop 9 upwardly into the path of the adjusting screw 12 carried by the slide 7. The purpose of this arrangement is that the slide 7 may be completely removed from its guideway on the top 3 by depressing the stop 9 so as to permit the slide 7 to pass clear thereover and off the end of the casing. Slight adjustment of the limit of movement of the slide 7 between the stops 8 and 9 may be had by turning the adjusting screw 12 out or in. This adjustment is, of course, made in order that the movement of the slide between the stops will be just sufficient to properly shift the films 5 and 6 in order to bring the next negative image and the next sensitized section of the positive film into position for proper printing as will be more fully described.

The film strips 5 and 6 are fed together, one directly overlying the other with the negative on the bottom, beneath the slide 7

as shown clearly in Figure 2. Hinged to the slide 7 as at 13 is a claw 14 provided with teeth 15 for engagement with the perforations of the film strips and normally forced into such engagement by the weight 16 secured to the top of the claw 14. As shown, the front edges of the teeth 15 are straight and therefore upon downward movement of the slide 7 such teeth will move the film strips together, whereas the rear edges of the teeth are bevelled so that upon return movement of the slide 7 the teeth will ride over the film to the upper end of the stroke of the slide whereupon the teeth will drop into the next set of perforations ready for the next shifting of the film.

The top 3 is provided with a printing opening 16*a* over which is secured a transparent window 17 of glass or other suitable material. The film strips 5 and 6 pass directly over this exposure opening and the size of the opening is such as to properly include and frame a single image to be printed from the negative film onto the positive.

Pivoted to the slide 7 as at 18 is a shifting member 19, the free end of which has secured thereto the hand grip 20. The resiliency of the shifting member 19 is such that it normally springs away from the slide. Mounted centrally of the shifter 19 as by the bracket 21 and pintle 22 is a presser pad 23 adapted when the shifter 19 is pressed downwardly by the handle 20 to engage with and securely hold the film strips in contact with each other and against the transparency 17 over the exposure opening 16*a*.

Mounted upon the top 3 at a point adjacent to slide 7 but slightly to one side thereof is a bearing 24 through which is mounted a plunger 25, its upper end lying directly beneath the pad 26 carried by the lower side of the handle 20, when the slide is shifted upwardly to the limit of its movement. Secured to the lower end of the plunger 25, as at 27, is one end of a lever 28 pivoted at 29 to a bracket 30 projecting from the underside of the top 3. The opposite end of this lever 28 is secured as at 31 to one end of a crank 32, the opposite end of which is secured as at 33 to an arm 34 rigid with a shutter flap 35, which flap is provided with a window 36 preferably of red glass or celluloid adapted to underly the exposure opening 16*a* as clearly shown in Figure 2. The end of the shutter flap 35 adjacent to the lug or arm 34 is hinged as at 37 to the frame 38, suitably secured to the underside of the top 3. A coil spring 39 (see Figure 4) normally urges and holds the shutter flap 35 in its upper position as shown in Figure 2 in which position it covers the exposure opening 16*a*.

From the foregoing it will be clear that when the slide 7 is shifted upwardly to the limit of its movement and the handle 20 of the shifter 19 depressed, not only will the presser pad 23 engage with and hold the film strips in contact with the window 17 of the exposure opening, but the pad 26 will depress the plunger 25, resulting in rocking the lever 28 on its pivot, thus exerting an upward pressure on the projecting arm 34 of the shutter flap, causing said flap to rock downwardly on its pivot as shown in dotted lines in Figure 2, thereby uncovering the exposure opening 16*a*.

As shown clearly in Figure 1, the casing is divided into two compartments 40 and 41 by means of the partition 42 suitably secured to the top, bottom and side walls of the casing as at 43. The lower angular portion of the partition 42 is provided with an openir g 44.

Mounted upon a bracket 45 on the inner surface of the wall 2 of the casing is a lamp socket 46 in which is a lamp 47, current to which is supplied in any suitable manner as at 48. The lamp 47 is preferably a white light and the rays therefrom pass through the opening 44 in the partition 42 to strike a reflecting surface within the compartment 41 from whence they are directed upwardly through the exposure opening 16*a* in the top 3.

As has been stated before, the window 36 of the shutter flap being preferably red glass or celluloid, it will be clear that with the shutter normally closed as shown in full lines in Figure 2, the reflected white light from the lamp 47 will not fog the film 6 overlying the exposure opening. In other words this shutter flap provides a "safe" light through which the images on the negative film are visible for framing, etc. Of course, when the shutter flap is rocked on its pivot away from the exposure opening the reflected white light from the lamp 47 acts as the printing light through the negative film onto the positive.

One of the most important features of my invention resides in the reflecting device for the light rays from the lamp 47. Located on the bottom of the casing within the compartment 41 are lugs 49, supporting spaced plates 50 and 51 between which is rotatably mounted on the pintle 52, a disk 53. These members are properly inclined so as to direct the reflected rays from the lamp 47 reaching the disk 53 through the opening 44, upwardly at the proper angle to pass such reflected rays directly through the exposure opening 16*a*. The upper plate 51 is provided with a window or opening 54 into which the rays from lamp 47 pass and out of which the reflected rays from the disk 53 project upwardly.

The rotatable disk 53 has mounted on its top a plurality of different reflecting surfaces. These surfaces are so placed that upon rotation of the disk 53 any desired reflecting surface may be brought beneath the window 54 to receive the light from the lamp 47. As illustrated, I have shown in Figure 4 the four reflecting surfaces—55 black, 56

white, 57 yellow and 58 a mirror. It will be understood, of course, that these reflecting surfaces may be varied and increased in number or changed in character as desired. One side wall of the casing adjacent to the reflecting device is provided with a slot 59 through which one edge of the disk 53 projects slightly. The edge of the disk 53 may be knurled to facilitate rotation thereof, if desired. Also, the edge of the disk may be provided with means for indicating to the operator which reflecting surface is in proper position behind the window 54. Such means may take the form of notches 60, one notch for white, 2 notches for black and so on.

The advantages of this arrangement of varying the reflecting printing light are obvious as the operator may, before making his print, determine from the density of his negative or strip of negatives what quality of printing light should be used to produce the desired printing result on the positive. If for instance, his negative is dense due perhaps to over exposure, he may turn the disk to bring the mirror reflecting surface into position for receiving and reflecting the light in order to give a brighter printing light for such negative. On the other hand, if the negative is weak and flat, perhaps the black reflecting surface would supply the best quality of light for printing. In other words, this means and method gives a printing light control in addition to the time element, but which does not require a change of light intensity, as by using different lamps or by regulating the intensity of a single lamp. Higher quality prints are thus made possible with great ease and dispatch.

The operation of my invention is as follows: If it is desired to print a strip of positive images from a similar strip of negative images the negative film 5 is threaded through the slide member 7 over the exposure opening and the positive strip is threaded directly thereover, the shifting claw 14 engaging both strips. The operator having determined the proper reflecting surface to be used generally for the negative strip, rotates the disk 53 to bring such surface under the opening 54 whereby to receive the rays from the lamp 47. When the film strips are properly framed with respect to the exposure opening 16*a*, the slide 7 is moved to its uppermost position, shown in Figure 2, whereupon the handle 20 is pressed downwardly, bringing presser pad 23 into engagement with the film strips to hold them tightly in contact and against the transparency over the exposure opening, and simultaneously depressing the plunger 25 which operates instantaneously to throw the shutter flap to the position shown in dotted lines in Figure 2, thus permitting the reflected light rays to pass through the exposure opening and through the negative film to the positive. When the proper length of exposure has been made, pressure on the handle 20 is relieved, whereupon the coil spring 39 immediately returns the shutter flap to its normal position and the printing operation is completed. The slide 7 is then pulled downwardly, the teeth 15 of the claw 14 shifting the film strips to bring the next negative image and the next unexposed area of the positive strip over the exposure aperture for the next printing.

Although I have described and illustrated my controlled reflected printing light principally in connection with a printing apparatus for printing the images from a strip of negative film to a strip of positive film, it will be understood that the same is equally adaptable to other types of printers as well, as for instance those wherein a single negative plate or film is to be printed on a single sensitized positive. Also many changes may be made in details of construction and method of operation without departing from the spirit and scope of my invention. I do not limit myself therefore to the exact structure herein shown and described other than by the appended claims.

I claim:

1. A photographic printer comprising a printing light and exposure opening, a non-actinic transparency normally covering said opening, slidable means for moving a negative strip and a positive strip to position over said opening, and means on said moving means for uncovering said opening to admit said printing light therethrough.

2. A photographic printer comprising an exposure opening in one wall thereof and a printing light, a non-actinic transparent shutter pivoted to said wall and normally covering said opening, a pivoted lever having one end engaging said shutter, and a plunger engaging the opposite end of said lever for rocking the same on its pivot whereby to move said shutter away from said opening and admit said printing light therethrough.

3. A photographic printer comprising a printing light of constant intensity, and an exposure opening, means for reflecting the rays from said light through said opening, and means on said reflecting means for varying the intensity of said reflected rays.

4. A photographic printer comprising a printing light of constant intensity and an exposure opening, a reflector for catching and directing the rays from said light through said opening, and means for changing the character of said reflector for varying the intensity of said reflected rays.

5. A photographic printer comprising a printing light of constant intensity and an exposure opening, a reflector having a plurality of reflecting surfaces of different reflecting characteristics, and means for placing any one of said surfaces in position to catch and direct the rays of said light to said exposure opening.

6. A photographic printer comprising a printing light of constant intensity and an exposure opening, a movable reflector having a plurality of reflecting surfaces of different reflecting characteristics, and means for moving said reflector for placing any one of said surfaces in position to catch and direct the rays from said light to said exposure opening.

7. A photographic printer comprising a printing light of constant intensity and an exposure opening, a movable reflector having a plurality of reflecting surfaces of different reflecting characteristics, and means for moving said reflector for placing any one of said surfaces in position to catch and direct the rays from said light to said exposure opening, and means on said reflector for indicating the character of the surface in such position.

8. A photographic printer comprising a printing light of constant intensity and an exposure opening, a rotatable member having a plurality of reflecting surfaces of different reflecting characteristics, and means for rotating said member for placing any one of said surfaces in position to catch and direct the rays from said light to said exposure opening.

9. A photographic printer comprising a printing light of constant intensity and an exposure opening, a rotatable member having a plurality of reflecting surfaces of different reflecting characteristics, and means for rotating said member for placing any one of said surfaces in position to catch and direct the rays from said light to said exposure opening, said member comprising a disk the edge of which extends through said printer for ready manipulation.

10. A photographic printer comprising a printing light of constant intensity and an exposure opening, a rotatable member having a plurality of reflecting surfaces of different reflecting characteristics, and means for rotating said member for placing any one of said surfaces in position to catch and direct the rays from said light to said exposure opening, said member comprising a disk the edge of which extends through said printer for ready manipulation, and indicating means on said edge for indicating the particular surface in reflecting position.

11. The method of photographic printing comprising the steps of passing the reflected rays of a printing light through a negative to a positive and controlling the intensity of said reflected rays in accordance with the characteristics of said negative by varying the character of the reflecting surface for said rays.

12. The method of photographic printing comprising the steps of passing the reflected rays of a printing light of constant intensity through a negative to a positive and controlling the intensity of said reflected rays in accordance with the characteristics of said negative by varying the character of the reflecting surface for said rays.

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