June 21, 1960 F. R. BERG 2,941,462

RETOUCHING OF PHOTOGRAPHIC IMAGES

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FIG. 1.

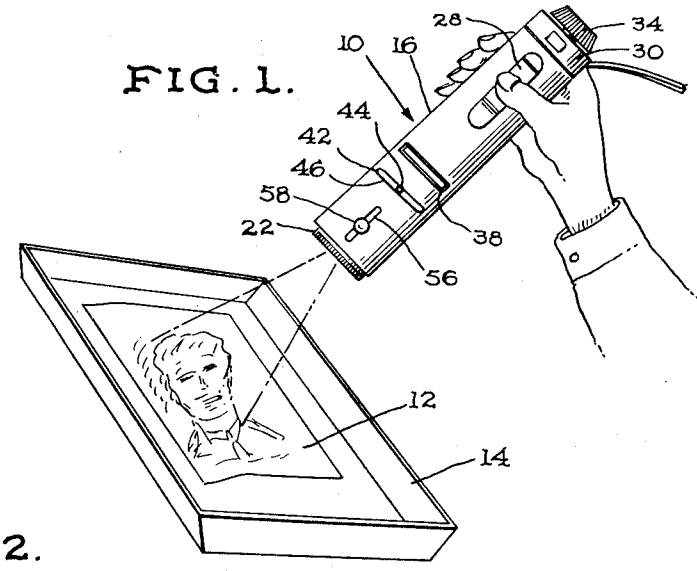
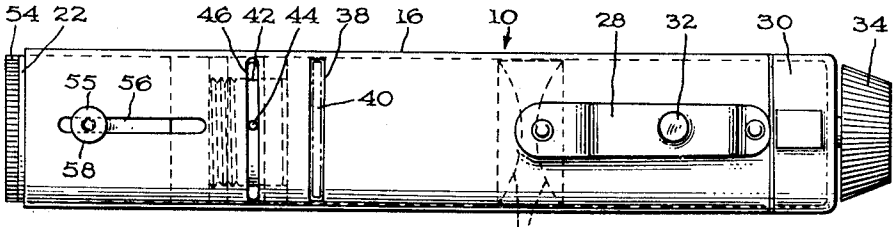


FIG. 2.



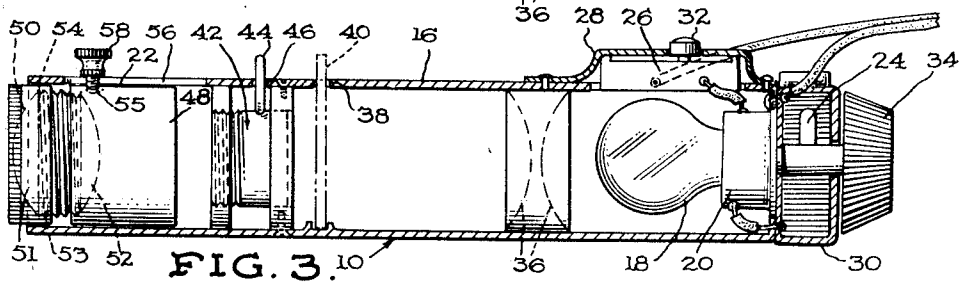


FIG. 3.

FIG. 4.

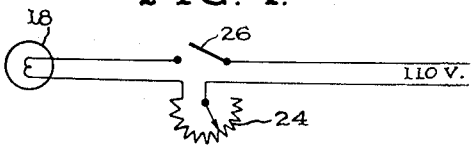


FIG. 5.

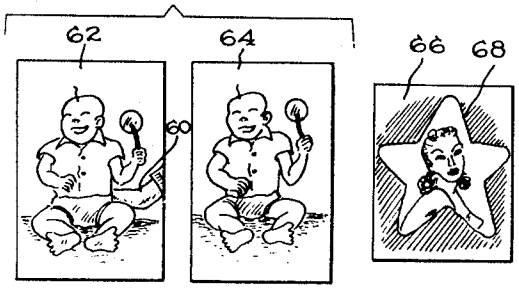


FIG. 6.

INVENTOR

FLORENCE ROBERT BERG

BY Gustav Miller

ATTORNEY

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RETOUCHING OF PHOTOGRAPHIC IMAGES

Florence Robert Berg, 4821 S. 28th St., Arlington, Va.

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1 Claim. (Cl. 95—101)

This invention relates to photographic processes and apparatus, and it particularly relates to the art of retouching photographic images in order to remove blemishes, marks, etc.

The art of retouching in the photographic field has, heretofore, been generally limited to the use of vibrating devices which distribute graphite powder over the areas to be retouched. In some cases, dyes have been substituted for the graphite. Abrasives, chemical solutions and etching knives of course are also used. However, in all cases, after development has taken place, the graphite, dye, abrasives, etc., is applied to the negative in order to cover up the defects. This is a rather tedious and painstaking process which requires the utmost skill. It is usually beyond the capacities of most amateur photographers and is often even too difficult for some professionals.

The present invention is not intended to replace the use of the vibrating retouching mechanisms but rather to supplement them in such manner that anyone can quickly and easily produce a correction of local areas of the photographic image. This constitutes the primary object of the present invention.

Another object of the present invention is to enable almost anyone to quickly and easily produce desired tones on local areas of the print while development takes place.

Another object of the present invention is to provide a device for quickly and easily effecting any desired background effect for the photographic image.

Other objects of the present invention are to provide an improved method and apparatus, of the character described, that is easily and economically produced, which is sturdy in construction, and which is highly efficient in operation.

With the above and related objects in view, this invention consists in the details of construction and combination of parts, as will be more fully understood from the following description, when read in conjunction with the accompanying drawing in which:

Fig. 1 is a perspective view of a device embodying the present invention, the device being shown in use.

Fig. 2 is a top plan view of the device of Fig. 1.

Fig. 3 is a side sectional view, with certain parts being shown in elevation, of the device of Fig. 1.

Fig. 4 is a wiring diagram of the light circuit.

Fig. 5 is a front elevational view showing two views of a single photograph, one before and one after retouching.

Fig. 6 is a front elevational view of a photograph having a background of a shape and size determined by the device of the present invention.

Referring now in greater detail to the drawing wherein similar reference characters refer to similar parts, there is shown in Fig. 1 a retouching device, generally designated **10**, which is being held over a photographic image **12** while the image is being developed in a developing solution held in pan **14**.

The device **10** comprises an elongated, cylindrical barrel **16** having an incandescent lamp **18** screwed into a socket **20** at one end of the barrel and a projection lens assembly **22** at the opposite, open end of the barrel. The lamp **18** is connected at one side through the rheostat **24** to the source of electrical energy, not shown, and at its other side, the lamp **18** is connected through a micro switch **26** to the source of energy, as best shown in Fig. 4. The micro switch **26** is provided in a housing **28** at the upper side of the barrel **16**, near the rear end of the barrel and above the lamp **18**, while the rheostat **24** is positioned in a housing **30** at the rear end of the barrel **16**. A push button **32** operates the micro switch **26** while a hand knob **34**, knurled for better grasping, is provided rearwardly of the device for operating the rheostat.

Within the barrel **16**, in front of the lamp **18**, are a pair of plano-convex condensing lenses **36**. In front of these lenses **36** is a slot **38** in the barrel **16** for receiving a background-forming slide **40**, to be described in greater detail hereafter. This slot **38** is positioned just to the rear of a variable iris diaphragm **42**. The iris **42** is actuated by a pin **44** extending upwardly therefrom through a slot **46**. The movement of the pin **44** in one direction along the slot **46** will act to open the iris while its opposite movement will act to close the iris.

At the front end of the barrel **16** is situated the aforementioned projection lens assembly **22** comprising a sleeve **48** at the front end of which is situated a projection lens device **50** which includes a front lens element **51**, a rear lens element **52** and an adjustable iris diaphragm **53** between the two lens elements. An adjustment ring **54** is connected to the diaphragm **53** to adjust it when desired. The ring **54** is knurled for easier grasping.

The sleeve **48** is movable longitudinally of the barrel **16** by a threaded pin **55** extending through and movable along a slot **56** in the barrel **16**. The pin **55** is held in adjusted position in the slot **56** by an internally threaded nut **58** provided with a knurled head for grasping.

In operation, in order to adjust the focus of the projection lens, the nut **58** is loosened and the sleeve **48** is slid along to the desired position, after which the nut **58** is tightened on pin **55** to hold the sleeve in place. For further fine adjustment, the adjustment ring **54** is operated to adjust the diaphragm **53** into the proper position.

In order to darken light areas of a photographic image to the desired tone, light is applied directly to the defective areas of the photographic image while the print is being processed by inspection in the developing tray. This simple process produces the same results as the tedious task of applying abrasives, chemical solutions or etching knives on the negative image in order to reduce the density of the silver deposit. Similarly, the elimination of any undesirable figure is effected by blocking out the image during the projection printing and the resultant highlight area is darkened to the desired tone by applying the light to this area while the print is being developed. In this manner, for example, the arm **60** shown in picture **62** in Fig. 5 is eliminated in picture **64**. This process of retouching can be performed in approximately one minute in comparison with hours or even days for the average amateur using any other known process.

In order to lighten dark areas, the paper negative process is preferably used. Corrections such as the elimination of circles under the eyes, undesirable lines, freckles, etc. are performed as follows: A positive print is made from the negative in the size desired for the final print. This positive print is inspected for defects such as dark lines which should be lightened or eliminated. A film positive is then made of the same size as the final print desired. This film positive should be prepared from a slow speed orthochromatic emulsion. The developer is of the ordinary commercial type with an anti-fog restrainer therein so as to permit more time for handling. The development of the film positive should, of course, take place under a red safe-light. After completion of

development, a water shortstop is used and those areas which are to be darkened are painted with light by means of the device **10**. Care should be taken at this point not to darken these areas excessively.

The above-described, slightly retouched, film positive is used to make a paper negative by the contact printing process. While developing the paper negative, it will be noted that the defective dark areas appearing on the initial test print made from the original negative appear light on the paper negative. The device **10** is thereby used to darken these areas to the proper density by inspection.

The final positive print is made by contact printing with the paper negative. Areas which were not sufficiently darkened on the film positive can be given the desired tone on this final print. This final print is then copied on film to facilitate rapid reproduction of additional copies having the same tonal gradations.

The device **10** can also be used successfully on original film negatives of size 4 x 5 or larger. After fixing the negative, a slow-speed, color-blind emulsion is applied to the rear surface of the negative. After being dried, and while working under a red light, the device **10** is used to project its light through the original emulsion carrying the negative image. In this manner, the applied emulsion is exposed only in those areas which require correction by projecting the light from the device **10** upon those areas which inspection shows requires correction.

The iris **42** exposes a circular image field, the size of which is varied according to adjustment of the iris. If other geometrical background patterns are desired in place of the circular pattern, this is readily accomplished by inserting into the slot **38** a slide **40** having an aperture of the desired shape and size. If this shape is a star, for example, the resultant photograph, such as indicated at **66** in Fig. 6, would have a star-like background **68**.

Although this invention has been described in considerable detail, such description is intended as being illustrative rather than limiting, since the invention may be variously embodied, and the scope of the invention is to be determined as claimed.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

A photographic retouching device comprising an elongated tubular barrel, an incandescent lamp at one end of said barrel constituting the rear end thereof and an open end at the front end thereof, a rheostat connected to said lamp to vary the voltage supplied thereto from a source of electrical energy, a knob for controlling said rheostat mounted exteriorly of said one end of said barrel concentrically therewith, a switch housing on said barrel, a miroswitch in said housing connected to said lamp for actuating same, a projection lens assembly at the front end of said barrel, said projection lens assembly including a slidable sleeve, a threaded pin on said sleeve, said barrel having a slot therein through which said pin projects, a clamping nut on said pin for holding said pin in a selected position in said slot, a front lens element, a rear lens element, said lens elements being respectively forwardly and rearwardly convexed on their non-confronting faces, an adjustable iris diaphragm between said lens elements, a knurled rotatable adjustment ring connected to said diaphragm and projecting forwardly out of the open front end of said barrel, a pair of plano-convex condensing lenses fixed in said barrel adjacent said lamp, a second variable iris diaphragm in said barrel between said projection lens assembly and said condensing lenses, a second pin connected to said second diaphragm, said barrel having a second slot therein to accommodate said second pin, movement of said second pin serving to adjust said second diaphragm, and said barrel having a third slot therein between said second iris diaphragm and said condensing lenses adapted for the reception of a background forming slide.

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