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[33] **Japan**
[31] **43/26212**

[54] **EXPOSURE FRAME FOR
ELECTROPHOTOGRAPHY**
2 Claims, 3 Drawing Figs.

[52] U.S. Cl. 355/3
[51] Int. Cl. G03g 5/10
[50] Field of Search 355/3, 17

[56] **References Cited**
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ABSTRACT: An exposure frame for use with an electrographic plate. The frame includes a resistant layer on a metal frame member. The resistant layer has a charging characteristic which is the same as the charging characteristic of the photoconductive layer of the electrographic plate. Since the charging characteristics are the same the portion of the photoconductive layer near the frame will not be irregularly charged. The layer on the frame has a discharge characteristic which is different from that of the photoconductive layer such that it discharges in a relatively short time compared to the photoconductive layer of the electroplate. In this manner, the frame may be used for subsequent electroplates.

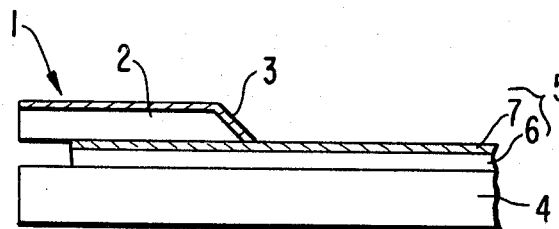


FIG. 1

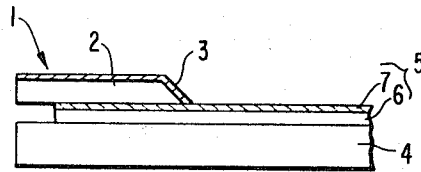


FIG. 2

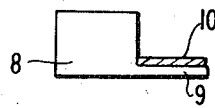
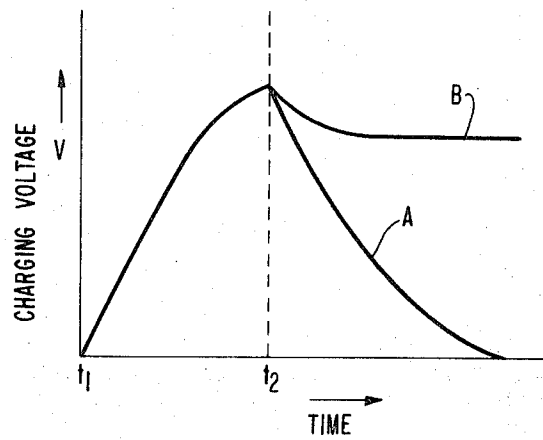


FIG. 3



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EXPOSURE FRAME FOR ELECTROPHOTOGRAPHY

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to an exposure frame for electrophotography which brings about uniform charging on the photoconductive layer of the electrophotographic plate.

2 Description of the Prior Art

When an electrophotographic photosensitive paper, which ordinarily comprises a conductive paper base and a photoconductive layer disposed thereon, is uniformly charged to give photosensitivity, the charging and exposing processes can be efficiently performed by holding the marginal portion of the photosensitive paper with a frame, in order to maintain the flatness of the paper, and image exposing after charging. A metallic frame is preferred from the view point of mechanical strength, but the marginal portion of the photosensitive paper is apt to be irregularly charged near the frame because of the conductivity of the metallic frame. This is because the charging characteristic of the photoconductive layer on the photosensitive paper is different from that of the frame. If a layer (e.g. a photoconductive layer itself) having the same characteristic as that of the photoconductive layer is provided on the upper face of the exposure frame, the photosensitive surface can be uniformly charged since the charging characteristic of the photosensitive paper is identical with that of the exposure frame. If the frame is not exposed to the light during the image exposure process, however, the photosensitive surface is not uniformly charged because of the residual charge on the frame when the frame is again used in a subsequent exposure process.

SUMMARY OF THE INVENTION

It is an object of this invention to provide an exposure frame thereby eliminating the above faults in the prior art.

In accordance with the present invention an exposure frame is provided which has a resistant layer on a metallic frame body, said layer having substantially the same charging characteristic as that of the photoconductive layer when charging, the charge thereof being capable of being reduced in a relatively short period of time.

Other objects and advantages of this invention will become apparent upon a consideration of the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGS. 1 and 2 are cross-sectional views of the embodiments of the exposure frame in accordance with the present invention, being depicted in conjunction with a photosensitive member, and

FIG. 3 is a diagram showing the characteristic curves of the exposure frame in accordance with the present invention and the photosensitive paper used with the exposure frame.

DETAILED DESCRIPTION OF THE INVENTION

Now referring to the drawings showing embodiments of the invention, an exposure frame is shown on the electrophotographic photosensitive paper on a base in FIG. 1. The exposure frame 1 is covered with a resistant layer 3 on the metallic frame body 2 thereof. Reference numeral 4 indicates a conductive baseboard, 5 indicates an electrophotographic photosensitive paper disposed thereon, of which 6 represents a conductive paper and 7 indicates a photoconductive layer.

The resistant layer 3 is provided for controlling the charging characteristic of the exposure frame 1. The charging characteristic of the resistant layer 3 is denoted by curve A and the charging characteristic of the photoconductive layer 7 on the electrophotographic photosensitive paper 5 is denoted by curve B in FIG. 3. The abscissa indicates time and the ordinate indicates the charging voltage.

The exposure frame 1 is placed on the photoconductive layer 7 of the electrophotographic photosensitive paper 5 and

charging is started at time t_1 with corona discharging electrodes (not shown.) The surface potential of the photoconductive layer 7 on the electrophotographic photosensitive paper 5, and the resistant layer 3 of the exposure frame 1 increases. Since the resistant layer 3 and the photoconductive layer 7 are charged substantially at the same time that is they have the same charging characteristic as shown in FIG. 3 between time t_1 and t_2 , the photoconductive layer 7 is uniformly charged without being affected by the exposure frame 1. At this time t_2 the charging is stopped and the photoconductive layer 7 is image exposed with the exposure frame 1 placed thereon. After the image exposure is completed, only the electrophotographic sensitive paper is developed. Those portions of the photoconductive layer 7 which are behind the exposure frame 1 have not been charged, and therefore, since the toner on these portions has a polarity opposite to that of the charged portions, the toner does not stock to these portions, resulting in a frame-shaped nondeveloped portion on the margins of the photosensitive paper. Since the photoconductive layer 7 is required to maintain a charge as an electrostatic latent image until the development is completed, it is preferable that the photoconductive layer employed experience a slight reduction of voltage after the time t_2 as shown in FIG. 3. In contradistinction, the voltage of the resistant layer 3 of the frame 1 is reduced in a relatively short time after the time t_2 as shown by curve A in FIG. 3. The discharge characteristic of the resistant layer, Curve A, is therefore different from the discharge characteristic of the photoconductive layer, curve B. Therefore, by charging the next photoconductive layer 7 with the frame 1 placed thereon immediately after the image exposure, a uniform charging is again attained, since there is no residual charge on the exposure frame 1. The charging characteristics of the photoconductive layer 7, when charged and the resistant layer are not required to be identical with each other, but only substantially identical.

Another embodiment of the exposure frame of the present invention is shown in FIG. 2. Specifically, the resistant layer 10 is provided on the extended portion 9 extending inwardly from the frame body 8 of high mechanical strength.

The electrophotographic sensitive paper may comprise a paper base with an aluminum foil layer adhered thereto, which is, in turn, coated with a powdery mixture of zinc oxide and silicon resin. The latter has been mixed in a ballmill at a ratio of 4 to 1 by weight.

The exposure frame may comprise, preferably, a metallic frame body coated with a thin layer of a mixture of carbon black and silicon resin which has been previously mixed with a ballmill.

A solid conductive coating agent containing carbon black or metallic powder in admixture with an insulating resin may be used as the resistant layer material, which can control the resistance thereof over a wide range and whose temperature dependence of resistance is low. Even if the insulating inorganic pigment is mixed into the solid conductive coating material, a material which can control the resistance thereof over a wide range can be made. It is preferred that the resistant layer be stable and that its characteristic not be varied by stain time and the like. For example, the binder resin is preferred to be thermosetting.

As the electrophotographic photosensitive material, zinc oxide, silicon, cadmium sulfide, alkyd resins, selenium and the like may be employed.

I claim:

1. An exposure frame for electrophotography to enhance uniform charging on the photoconductive layer of an electrophotographic plate, said frame comprising a metallic frame member, a resistant layer provided on said frame member, said resistant layer having the same charging characteristic as said photoconductive layer whereby the resistant layer and the photoconductive layer are charged at substantially the same rate.

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2. An exposure frame as set forth in claim 1 wherein said resistant layer on said frame member has a discharge characteristic such that resistant layer discharges in a relatively short time compared to the discharge of said photoconductive layer.

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