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PROCESS WHICH ENABLES THE REPRODUCTION OF IMAGES BY MEANS OF DIAZOIC COMPOUNDS TO BE OBTAINED

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Diazotypic processes consist of creating on a suitable background azoic colors in general in places untouched by light.

These azoic colors result from mixing a diazoic compound with an azoic compound. This operation, known as coupling, has up till now required the help of reagents called "developers" for its practical success; the developer is gaseous (ammonia) if the azoic compound is associated with a diazoic compound on the background, the developer is liquid if the diazoic compound is alone on the background; this liquid developer is then constituted by the association of an azoic compound with a suitable alkali.

Another process is based on the auto-coupling properties of certain diazoics in connection with their photolysis products.

In this case, an exposure to slightly actinic light, under a drawing, partially decomposes the diazoic in the places touched by the light; a phenol is formed which couples spontaneously with the non-photolysed part of the diazoic, and the part of the proof not protected by the drawing assumes a deeper color. A second exposure to a strongly actinic light, the drawing being withdrawn, entirely destroys the diazoic that has so far been protected, and the outline appears in white on a dark background. A negative is definitely obtained from a positive.

By making use of the known reaction of the auto-coupling of a diazoic with its photolysis phenol, the present invention enables a positive to be obtained from a positive.

According to the invention, known as the Francioli process, the process consists of first of all using a strongly actinic light, under a tracing, then a slightly actinic light, with the tracing withdrawn.

The following describes the operation:

A paper impregnated with a solution of a diazoic of the above-mentioned type is exposed to a strongly actinic light, for instance, to the rays of a carbon arc lamp, the paper being under a drawing. The drawing is removed and the proof is then exposed to a slightly actinic light (Wood's light, or reduced daylight, or rays of a high pressure mercury vapor tube) or else, for a short period, to the former strongly actinic source of light. It is advisable to dampen the paper between the two exposures. Under the action of this second exposure, the outline becomes colored, either spontaneously, or after remaining in the dark for a few seconds.

In the particular case of pencil drawings, where the line is only slightly opaque and allows part

of the light to pass through, a single strongly actinic exposure is sufficient, and the outline appears after remaining a few minutes in the dark.

In this manner a direct image in colored lines is obtained on a white background and the proof is definitely fixed.

During the first strongly actinic exposure, under the drawing, the diazoic is completely destroyed in the places touched by the light.

During the second slightly actinic exposure, without the drawing, the diazoic that had been protected by the lines of the drawing is practically decomposed in phenol by the feeble rays; in view of the strong affinity of the subsisting diazoic for its photolysis product, there is immediate coupling and coloring of the line in most cases. In the other cases, this coloring takes place more slowly by exposure to the air in the dark.

The power and the quality of the source of light are regulated so that the ratio of the phenol produced to the subsisting diazoic forms the theoretical molecular ratio for obtaining the maximum of coloring intensity.

Humidity helps this reaction. It is therefore better to dampen the back of the proof with water before making the second exposure; the image will then appear more quickly.

The adjunction of hygroscopic substances, such as glycerine or glycol to the sensitive film, also helps this auto-coupling and obviates damping the back of the proof. On the other hand, the adjunction of nitrate of copper is harmful and prevents the copulation from taking place.

A variation of the process consists of incorporating urea $\text{—CO(NH}_2\text{)}_2$ with the sensitive solution. The paper coated with a 20% diazoic solution containing 5 to 10% of urea, is exposed under a tracing to the light of a carbon arc lamp.

After the drawing is removed, the proof is exposed to a feeble light (Wood's light, for instance), then heated to 90–100° centigrade. The urea, by decomposing with the heat, liberates ammonia gas, which, by taking up the acid brought into action during coupling, assists the coupling of the diazoic with its photolysis phenol and hastens the coloring of the line.

Amongst the diazoic compounds giving, by photolysis, a phenol that copulates spontaneously with the subsisting diazoics, the inventor has discovered that it was advantageous to utilise the imidazol derivatives and, in particular, the diazoic of C. methyl amino 4. naphthimidazole. This product gives a particularly sharp violet image.

The invention therefore deals more particularly with the application—in view of the above-mentioned process—of the imidazols and, in particular, of C methyl amino 4 naphthimidazole.

I claim:

1. The method of directly obtaining positive images of a positive drawing on a translucent sheet comprising preparing a sheet having a sensitive film containing the diazonium compound produced from C. methyl amino-4-naphthimidazole which is capable of coupling with products of its photolysis to give a colored compound, exposing the film to highly actinic light while under a translucent positive, removing the posi-

tive from said film, and exposing the film to a lightly actinic source of light.

2. The method of directly obtaining positive images of a positive drawing on a translucent sheet comprising preparing a sheet having a sensitive film containing the diazonium compound produced from C. methyl amino-4-naphthimidazole which is capable of coupling with products of its photolysis to give a colored compound, preparing a drawing having lightly translucent lines traced on a highly translucent supporting sheet, and exposing the film to actinic light while covered by said drawing.

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