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MAXIMILIAN PAUL SCHMIDT AND WILHELM KRIEGER, OF WIESBADEN-BIEBRICH, GERMANY, ASSIGNORS TO KALLE & CO., AKTIENGESELLSCHAFT, A CORPORATION OF GERMANY

LIGHT-SENSITIVE LAYERS AND PROCESS OF PREPARING THEM

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Our present invention relates to light-sensitive layers and process of preparing them, more particularly to light-sensitive layers containing a mixture of several diazo compounds of different kinds.

There are already known light-sensitive layers suitable for the preparation of negative diazo photo-prints. According to the process described in German patent specification No. 82,239, dated June 10, 1895, in the name of Aktiengesellschaft fuer Anilin-Fabrikation, a diazo compound is used for this purpose whose decomposition product formed by the exposure to light is coupled with another diazo compound. According to German patent specification No. 111,416 dated April 13, 1899, in the name of Marcel Schoen, diazo-salicylic acid or derivatives thereof are employed for the manufacture of light-sensitive layers. By the process of Adolf Feer, disclosed in German patent specification No. 53,455 dated December 5, 1889, a negative is obtained from a positive by using azo components and diazo sulfonates, which, however, are no real diazo compounds since they are not capable of directly coupling with azo components. Finally German patent specification No. 379,998 dated July 13, 1920, in the name of Kalle & Co. Aktiengesellschaft, describes a process of producing negative copies by using diazo compounds of ortho-amino-phenols in the presence of an alkali.

All the said processes have, however, not generally been adopted in practice. This may chiefly be due to the unfavorable action of the alkali present upon the paper and to the insufficient stability of the preparations. The copies obtainable according to the above-mentioned German specification No. 111,416 have, moreover, the disadvantage of having a very dull aspect.

Now we have found that light-sensitive layers are obtained which can advantageously be used in practice for the negative process by incorporating into the layer a mixture of two or more diazo compounds. By exposing such a layer to light under a negative a positive is obtained in the known manner. In view of the great quantity of compounds available for this purpose it is possible to

prepare stable layers yielding copies of the most varied tones.

It is advantageous to choose the diazo compounds in such a manner that, after the exposure to light under a negative, there is still an excess of that component which is capable of coupling with the decomposition product of the second component. This is always the case if one of the diazo compounds is more sensitive to light than the other. If the proportion with regard to the sensitiveness to light is not so favorable, the quantitative proportions may be varied in such a manner that there still exists an excess of one of the compounds after the other one has been decomposed by the action of light.

There may also be used diazo compounds which are per se capable of forming dyestuffs with their decomposition products, for instance diazosalicylsulfonic acid (cf. German patent specification No. 111,416 above referred to). In this case the pictures produced which are otherwise rather dull, can be considerably improved.

The process of our present invention can be carried out in such a manner that an acid or an acid salt is incorporated into the layer in the presence of one or more diazo compounds of great coupling capacity. Stabilizers, as for example sodium naphthalene-trisulfonate, may also be added to the preparation or previously or subsequently be incorporated into the paper. For producing different tones, metal salts may be added to the layer, or metal compounds of diazo compounds may be used. In general all operations can be performed as they are practiced in the art of producing diazo prints.

The following examples illustrate our invention, but they are not intended to limit it thereto. The parts are by weight:

(1) 15 parts of cadmium chloride double salt of the diazo compound from 5-diethyl-2-amino-1-phenol, obtainable by diazotizing 5-diethylamino-2-amino-1-phenol and precipitating the readily-soluble diazo compound by means of cadmium chloride, are dissolved in 1000 parts of water together with 15 parts of 4-chloro-2-diazo-1-phenol-6-sulfonic acid obtainable by diazotizing 100

4-chloro-2-amino-1-phenol-6-sulfonic acid, and this solution is applied on a base as usual. After having exposed the base to light under a negative and watered it, an orange-colored copy is obtained. By bringing the copy after exposure to light into an atmosphere of gaseous ammonia and subsequently watering it, the picture assumes more contrasting tones and its color changes to brown. When treated with copper sulfate, the picture assumes a more bluish tone.

(2) 20 parts of dianisyltetrazoborofluoride, obtainable by tetrazotizing dianisidine (4,4'-diamino-3,3'-dimethoxy-diphenyl) and precipitating the diazo compound by means of hydrofluoboric acid, 40 parts of diazo-salicylsulfonic acid, obtainable by diazotizing 3-amino-2-hydroxy-5-sulfobenzene-1-carboxylic acid, and 10 parts of tartaric acid are dissolved in 1000 parts of water. A paper brushed over with this solution, or a cellulose film or gelatinized nitro- or acetylcellulose film soaked with it, yields, after exposure to light under a negative, a reddish-brown picture, which can immediately be fixed by watering. For improving its fastness to light, it may be toned for instance with a solution of copper sulfate.

(3) 43 parts of stannic tetrachloride double salt of 3,3'-6,6'-tetramethoxy-4,4'-tetrazodiphenyl, obtainable by diazotizing 3,3'-6,6'-tetramethoxy-4,4'-diaminodiphenyl, 20 parts of cadmium chloride double salt of the diazo compound from 5-diethylamino-2-amino-1-phenol, prepared as indicated in Example 1, and 10 parts of tartaric acid are dissolved in 1000 parts of water. This solution is applied on a base in the usual manner. After exposing the base to light under a negative a brown copy is obtained which is fixed by watering.

(4) 15 parts of cadmium chloride double salt of the diazo compound from 5-diethylamino-2-amino-1-phenol, prepared in the manner indicated in Example 1, 15 parts of 4-chloro-2-diazophenol-6-sulfonic acid (cf. Example 1) and 20 parts of ortho-diazo-salicylsulfonic acid (cf. Example 2) are dissolved in 1000 parts of water. This solution is applied as usual, on a suitable base, for instance on paper treated with barytes. After exposure to light under a negative, the resulting yellowish-brown positive is watered.

We claim:

1. The process of preparing light-sensitive layers by means of diazo compounds which consists in applying on a base a mixture of at least two different diazo compounds.

2. The process of preparing light sensitive layers by means of diazo compounds which consists in applying on a base a mixture of at least two different diazo compounds of approximately equal sensitiveness to light.

3. The process of preparing light-sensitive

layers by means of diazo compounds which consists in applying on a base a mixture of at least two different diazo compounds of approximately equal sensitiveness to light in different molecular proportions.

4. The process of preparing light-sensitive layers by means of diazo compounds which consists in applying on a base a mixture of at least two different diazo compounds of approximately equal sensitiveness to light in different molecular proportions with the addition of a stabilizing agent.

5. The process of preparing light-sensitive layers by means of diazo compounds which consists in applying on a base a mixture of at least two different diazo compounds of approximately equal sensitiveness to light in different molecular proportions with the addition of a stabilizing agent and a metal salt.

6. The process of preparing light-sensitive layers by means of diazo compounds which consists in applying on a base a mixture of at least two different diazo compounds, at least one of which has a great coupling capacity, with the addition of an acid.

7. The process of preparing light-sensitive layers by means of diazo compounds which consists in applying on a base a mixture of at least two different diazo compounds of approximately equal sensitiveness to light, at least one of which has a great coupling capacity, with the addition of an acid.

8. The process of preparing light-sensitive layers by means of diazo compounds which consists in applying on a base a mixture of at least two different diazo compounds of approximately equal sensitiveness to light, at least one of which has a great coupling capacity, in different molecular proportions with the addition of an acid.

9. The process of preparing light-sensitive layers by means of diazo compounds which consists in applying on a base a mixture of at least two different diazo compounds of approximately equal sensitiveness to light, at least one of which has a great coupling capacity, and a stabilizing agent, with the addition of an acid.

10. The process of preparing light-sensitive layers by means of diazo compounds which consists in applying on a base a mixture of at least two different diazo compounds of approximately equal sensitiveness to light, at least one of which has a great coupling capacity, a stabilizing agent and a metal salt, with the addition of an acid.

11. As new products, light-sensitive layers containing a mixture of at least two different diazo compounds.

12. As new products, light-sensitive layers containing a mixture of at least two different diazo compounds of approximately equal sensitiveness to light.

13. As new products, light-sensitive lay-

ers containing a mixture of at least two different diazo compounds of approximately equal sensitiveness to light in different molecular proportions.

14. As new products, light-sensitive layers containing a mixture of at least two different diazo compounds of approximately equal sensitiveness to light in different molecular proportions with the addition of a stabilizing agent.

15. As new products, light-sensitive layers containing a mixture of at least two different diazo compounds of approximately equal sensitiveness to light in different molecular proportions with the addition of a stabilizing agent and a metal salt.

16. As new products, light-sensitive layers containing a mixture of at least two different diazo compounds, at least one of which has a great coupling capacity, with the addition of an acid.

17. As new products, light-sensitive layers containing a mixture of at least two different diazo compounds of approximately equal sensitiveness to light at least one of which has a great coupling capacity, with the addition of an acid.

18. As new products, light-sensitive layers containing a mixture of at least two different diazo compounds of approximately equal sensitiveness to light at least one of which has a great coupling capacity, in different molecular proportions with the addition of an acid.

19. As new products, light-sensitive layers containing a mixture of at least two different diazo compounds of approximately equal sensitiveness to light at least one of which has a great coupling capacity, and a stabilizing agent, with the addition of an acid.

20. As new products, light-sensitive layers containing a mixture of at least two different diazo compounds of approximately equal sensitiveness to light at least one of which has a great coupling capacity, a stabilizing agent and a metal salt, with the addition of an acid.

In testimony whereof, we affix our signatures.

MAXIMILIAN PAUL SCHMIDT.
WILHELM KRIEGER.