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PROCESS OF DEVELOPING FINGERPRINTS

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15 Claims. (Cl. 41—41)

This invention relates to a process of treating paper and like material to develop latent fingerprints occurring thereon.

The invention is based on the discovery that the concentration of proteins and amino acids in a left print is so great that a latent print, which is thus invisible to the naked eye, will become fully visible at the development thereof by means of colour indicators for proteins or amino acids. The greatest value of the invention resides in that both extra-ordinarily weak prints, which could not be developed by processes hitherto known, and very old prints can be made visible with the aid of the improved process, which is due to the deposits of proteins and amino acids being very durable. The invention is essentially characterized in that the material is treated with an amino acid or protein indicator whereby the amino acids or proteins in the prints will be developed, thus making the finger line pattern visible for identification purposes.

It is extremely advantageous to use ninhydrin as amino acid indicator. The treatment with ninhydrin must be performed with almost waterfree solvents, since the easy solubility of the amino acids in water would result in a blurring of the fingerprint pattern if ninhydrin dissolved in water were used. The ninhydrin is therefore dissolved in acetone, ether or another organic solvent. The solution should besides be acidified with e. g. acetic acid since the ninhydrin reaction gives the strongest colour development in an acid environment. As certain paper types contain lime or other bases, the added acetic acid neutralizes their action, and the development thus takes place under favourable conditions.

The amino acid indicator preferably consists of a 0.2% ether or acetone solution of ninhydrin, to which solution 4% of glacial acetic acid have been added. It is obvious, however, that the composition of the solution can be changed within relatively wide limits.

The paper can be rapidly dipped into the acetone solution for treatment, whereupon the solution is permitted to drip off and the paper is left to dry by itself. More suitable than the dipping process which is the simplest one, is however the spraying process which involves that the solution is finely distributed by means of compressed air and sprayed onto the paper surface as an extremely fine mist.

After the spraying the paper is left to dry in air, which is important for obtaining a good colour intensity at the subsequent development. The development is a process which is very slow at room temperature, and it should therefore preferably be carried out in heating cabinets at a temperature of 80–120° C. for a time of 1–3 minutes. Other temperatures and times can of course also be used.

The colour of the prints varies between carmine and bluish violet depending inter alia on the paper types and the composition of the amino acids. Some of these paper types give dark blue colours, others bright red to pink colours. If the paper is exposed to the action of ammonia vapour, a change of colour occurs into blue which gives a better contrasting effect.

It may be suitable in certain cases to interrupt the developing process by a treatment with copper salts, which simultaneously involves a fixation of the prints so that they will be durable almost unlimitedly.

The ninhydrin process is applicable on a great variety of paper types, such as ordinary glazed stationery, envelopes, hard-sized envelopes, newspaper, blotting paper, greaseproof paper and bank notes. The process can also be employed for developing prints on fabrics.

Amido black is especially suited as protein indicator. In using this reagent the following method should be applied. The paper is dipped into an acetous methanol solution which has been saturated with said reagent. After about half a minute the paper is taken out of the solution which is permitted to drip off. The paper is then rinsed several times in a pure mixture of methanol and acetic acid. Finally, the paper is left to dry at room temperature. The finger line pattern will then appear in dark blue colour against a background of brighter blue colour. This developing process gives an especially good result if the fingers which have left the print were stained with blood serum.

The invention must not be considered as limited to what is described above, for many modifications of the process described can be resorted to within the scope of the appendant claims.

What I claim and desire to secure by Letter Patent is:

1. A process of treating paper and the like material to develop latent fingerprints occurring thereon, which comprises treating the material with an indicator selected from the group consisting of amino acid and protein indicators.

2. A process according to claim 1, wherein the indicator is ninhydrin.

3. A process according to claim 1, wherein the indicator is an organic solvent solution of ninhydrin.

4. A process according to claim 3, wherein the solution is sprayed onto the material in the form of a fine mist.

5. A process according to claim 3, drying the material after treatment with the said solution, and then heating the material, whereby the prints are developed.

6. A process according to claim 5, wherein the heating is carried out at a temperature of 80–120° C. for 1 to 3 minutes.

7. A process according to claim 1, wherein the indicator is an acetone solution of ninhydrin.

8. A process according to claim 1, wherein the indicator is an ether solution of ninhydrin.

9. A process according to claim 1, wherein the indicator is an acidified organic solvent solution of ninhydrin.

10. A process according to claim 1, wherein the indicator is an acetone solution of ninhydrin acidified with acetic acid.

11. A process according to claim 1, wherein the indicator is an ether solution of ninhydrin acidified with acetic acid.

12. A process according to claim 1, and interrupting the development of the prints by treating the material with copper salt whereby the developed prints are fixed.

13. A process according to claim 1 wherein the indicator is amido black.

14. A process of treating paper and the like material to develop latent fingerprints occurring thereon, which comprises subjecting the said material to the action of a 0.2% ether solution of ninhydrin to which 4% of glacial acetic acid has been added.

15. A process of treating paper and the like material to develop latent fingerprints occurring thereon, which comprises subjecting the said material to the action of a 0.2% acetone solution of ninhydrin to which 4% of glacial acetic acid has been added.

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