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Application and Provisional Specification No. 1241/Cal/76 dated 9th July 1976.

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" Improvements in or relating to a process for preparation of ~~xxxxxxxxxxxx~~ fluorescent ink marking ink ".

Council of Scientific and Industrial Research, Rafi Marg, New Delhi-1, India, an Indian registered body incorporated under the Registration of Societies Act (Act XXI of 1860).

The following specification describes the nature of this invention :-

This is an invention by Chittari Venkata Suryanarayana, Scientist, Mohammed Iftikhar Ahmed Siddiqui, Scientist, Magamony Rajaram, Scientist, Kannan Kumarath Gopinathan, Scientist, and Ramayyer Lakshminarayanan, Scientist, Central Electrochemical Research Institute, Karaikudi, Tamil Nadu, India, all Indian citizens.

PRICE : TWO RUPEES.

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This invention relates to fluorescent re-admission ink.

Fluorescent re-admission ink can be used in stamp pads, and when stamped on the hand cannot be seen under ordinary light, but fluoresces in bright colour under a 3650 Å lamp. Wherever 'pass-out' is allowed after admission, the ink can be used as an effective re-admission control system.

Hitherto, use of fluorescent re-admission ink abroad has been reported, for instance, in re-admission control systems. However, details for the production of the ink are not available in the literature.

The object of the invention is to provide with a method of making fluorescent re-admission ink for various purposes, at the same time, using all indigenous materials.

To these ends, the invention broadly comprises in formulating from a filtered solution of turmeric in alcohol and an aqueous solution of a fluorescent substance such as fluorescein or acriflavin, and additionally glycerine, an invisible ink, which, when applied to the hand, is substantially invisible in ordinary light and luminesces when exposed to ultraviolet radiation. More usually, the exciting radiation is the ultraviolet of 3650 Å obtainable from a mercury vapour lamp and the emitted radiation is in the visible range.

It may be pointed out here that whereas the turmeric functions as a suitable adhesive-cum-carrier, the glycerine used herein works as a thickener, the resulting invisible ink thus made in the manner of our invention in such critical proportions as reported herein has other desirable properties also, such as adhesion for a suitable duration of time, required for the applications and easy washability thereafter.

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We shall now proceed to describe in greater detail the method of making the fluorescent re-admission ink of our invention.

A saturated solution of turmeric in alcohol is prepared and filtered. To the filtrate is added a solution of a fluorescent substance such as fluorescein or acriflavin etc.,. To the mix is added a small amount of thickening agent such as glycerine. Having described the manner in which the fluorescent re-admission ink is prepared, we shall not indicate the mode of its use for the particular application, namely, the re-admission control system.

Customer's hand is stamped with the fluorescent ink as he leaves the admission area. The ink dries immediately and is invisible under ordinary light. Re-admission is gained by exposing the hand under a ultraviolet lamp giving 3650 Å radiation, when the marking fluoresces. The ink formulated will withstand several hand washings and stands for about ^{a period between 8-24} ~~24~~ hours. The ink can be used for effective re-admission control at fairs, swimming pools, race tracks, arenas, ball rooms, skating rinks, fraternal organizations, clubs, sporting events, school events, amusement areas, auditoria etc.,. Also in State, Municipal or local penal institutions or jails where positive identification must be made quickly for visitors or limited access trustees. The ink may look slightly coloured when seen in container, but will become invisible when applied on the body.

The following typical examples are given to illustrate the invention:

EXAMPLE I

A saturated solution containing 0.25 g of turmeric powder
is prepared and the filtrate taken (solution I).

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1 mg of fluorescein is dissolved in 15 cc of water (solution II). To a mix of I (10 cc) and II (15 cc), 15 cc of glycerine is added. The resulting composition is used as the invisible stamping ink and luminesces with a green colour under ultraviolet of 3650 Å. It withstood 4 to 5 washings in 24 hours.

EXAMPLE II


The composition is made exactly as in the manner of Example I except for the fact that the fluorescent material fluorescein is replaced by acriflavin. The resulting composition is used as the invisible stamping ink and luminesces with a green colour under ultraviolet of 3650 Å. It withstood 4 to 5 washings in 24 hours.

ADVANTAGES

The following are the main advantages of the invention:

- 1 The method of making fluorescent re-admission ink is simple and elegant.
- 2 The materials are all indigenously available.
- 3 Stampings on the hand with the ink are quite sharp.
- 4 The stamping ink is completely harmless to skin and clothing.
- 5 The stamping ink marking withstands several hand washings.
- 6 The stamping ink marking stands for ~~not more than~~ ^{a period between} 8 - 24 hours.

Dated this 7th day of July 1976



Asst. Patents Officer,
Council of Scientific & Industrial Research

COMPLETE SPECIFICATION

(Section—10)

" Improvements in or relating to a process for preparation of fluorescent marking ink "

Council of Scientific and Industrial Research, Rafi Marg, New Delhi-1, India, an Indian registered body incorporated under the Registration of Societies Act (Act XXI of 1860).

The following specification particularly describes and ascertains the nature of this invention and the manner in which it is to be performed :-

This is an invention by Chittari Venkata Suryanarayana, Scientist, Mohammed Ifttkhar Ahmed Siddiqi, Scientist, Nagamony Rajaram, Scientist, Kannan Kumarath Gopinathan, Scientist and Ramayyar Kakshminarayanan, Scientist, all of the Central Electrochemical Research Institute, Karaikudi, Tamil Nadu, India, all Indian ~~xxx~~ citizens.

This invention relates to a process for the preparation of a fluorescent marking ink.

This fluorescent marking ink can be used in stamp pads, and when stamped on the hand cannot be seen under ordinary light, but fluoresces in bright colour under a 3650 A⁰ ultraviolet lamp. Whenever 'pass-cut' of persons is allowed after admission in any enclosed space, the ink can be used as an effective readmission control system for people.

Hitherto, use of fluorescent marking ink abroad has been reported, for instance, in readmission control systems. However, details for the production of the ink are not available in the literature.

The object of the invention is to provide with a method of making fluorescent marking ink for various purposes, at the same time, using all indigenous materials.

To these ends, the invention broadly comprises in a process for the preparation of a filtered solution of turmeric in alcohol and an aqueous solution of a fluorescent substance such as fluorescein or acriflavin, and additionally glycerine, an invisible marking ink, which, when applied to the hand, is substantially invisible in ordinary light and luminesces when exposed to ultraviolet radiation. More usually, the exciting radiation is the ultraviolet of 3650 A⁰ obtainable from a mercury vapour lamp and the emitted radiation is in the visible range.

It may be pointed out here that whereas the turmeric functions as a suitable adhesive-cut-carrier, the glycerine used herein works as a thickener, the resulting invisible marking ink thus made in the manner of our invention is critical in proportion and has all other desirable properties also, such as adhesion for a suitable duration of time, required in most of its applications and easy washability thereafter.

The ink prepared according to our invention should have the property of (1) not being toxic to the skin, (2) capable of standing for a period of not more than 24 hours, (3) capable of standing 4-5 washings within 24 hours and (4) should become

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Merely the acryflavin or fluorescein will not stand 4-5 washings and will not last for 24 hours. Turmeric can stand for 24 hours but does not luminesce as fluorescein or acryflavin. The most important property of adhesion to the skin is controlled by the quantity of the binder and overall quality of the ink is critically dependent upon the composition of the various ingredients. Hence, the final product does not have the same property as any one of the ingredients. For instance, non-fluorescent ingredients glycerine and alcohol condition the very formulation and the quality of the readmission ink. The specification thus gives the description of a new product which has new properties different from the properties of each individual ingredient separately. Each individual ingredient inter-reacts to produce a new product, that is, a marking ink with specific desired properties.

In another preparation, using sodium salicylate as the fluorescent material along with a suitable binder, (and not using turmeric solution), a fluorescent marking ink could be obtained which gives a blue emission when excited by ultraviolet of 3650 \AA .

We shall now proceed to describe the method of making the fluorescent marking ink according to our invention.

A saturated solution containing 0.25 g of turmeric powder in 15 cc alcohol is filtered (Solution I). 1 mg of fluorescein or acryflavin is dissolved in 10 cc of water (Solution II). To the reaction product of interaction of I (10 cc) and II (15 cc), 15 cc of glycerine is added.

Having described the manner in which the fluorescent ink is prepared, we shall now indicate the mode of its use for the particular application, namely, the readmission control system.

Customer's hand is stamped with the fluorescent ink as he leaves the admission area. The ink dries up immediately and is invisible in ordinary light. Readmission is gained by showing

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the hand under an ultraviolet lamp giving 3650 Å radiation, when the marking fluoresces. The ink formulated withstands several hand washings and stays for a period between 8 - 24 hours. The ink can be used for effective readmission control at fairs, swimming pools, race tracks, arenas, ball rooms, skating rinks, fraternal organizations, clubs, sporting events, school events, amusement areas, auditoria etc., Also in State, Municipal or local penal institutions or jails where positive identification must be made quickly for visitors or limited access trustees. The ink may look slightly coloured when seen in container, but will become invisible when applied on the body.

The following typical examples are given to illustrate the invention:

EXAMPLE I

A saturated solution containing 0.25 g of turmeric powder in 15 cc of alcohol is filtered and the filtrate taken (solution I). 1 mg of fluorescein is dissolved in 15 cc of water (solution II). To a mix of I (10 cc) and II (15 cc), 15 cc of glycerine is added. The resulting composition is used as the invisible stamping ink and luminesces with a green colour under ultraviolet of 3650 Å. It withstood 4 to 5 washings in 24 hours.

EXAMPLE II

The composition is made exactly as in the manner of Example I except for the fact that the fluorescent material fluorescein is replaced by acriflavin. The resulting composition is used as the invisible stamping ink and luminesces with a green colour under ultraviolet of 3650 Å. It withstood 4 to 5 washings in 24 hours.

ADVANTAGES

The following are the main advantages of the invention:

- 1 The method of making fluorescent readmission ink is simple and elegant.

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- 2 The materials are all indigenously available.
- 3 Stampings on the hand with the ink are quite sharp.
- 4 The stamping ink is completely harmless to skin and clothing.
- 5 The stamping ink marking withstands several hand washings.
- 6 The stamping ink marking stands for a period between 8-24 hours.

WE CLAIM:

- 1 A process for the preparation of marking ink with fluorescent ink which comprises in inter-reacting a saturated filtered solution of turmeric in alcohol, an aqueous solution of a fluorescent substance, and additionally glycerine to obtain a product, which, when applied to the hand, is substantially invisible in ordinary light and luminesces when exposed to ultraviolet radiation, such as 3650 Å.
- 2 A process as claimed in claim 1, wherein the fluorescent substance is fluorescein, the fluorescent ink thus made giving green luminescence on exposure to 3650 Å.
- 3 A method as claimed in claim 2 wherein the fluorescent substance is acriflavin, the fluorescent ink thus made giving green luminescence on exposure to 3650 Å.
- 4 A process as in claim 2 wherein a saturated solution of turmeric powder in alcohol and a solution of fluorescein in water are mixed together by observing the green luminescence and on a 3650 Å radiation until the maximum intensity is observed.
- 5 A process as claimed in any of the preceding claims wherein 0.25 g of turmeric powder in 15 cc alcohol is filtered (Solution I), 1 mg of acriflavin is dissolved in 15 cc water (Solution II), ~~10 cc of solution I~~ and 10 cc of solution I and 15 cc of solution II are admixed to inter-react and 15 cc of glycerine is added to the reaction product.

Dated this 24th day of May, 1977

U. S. S. S.
SCIENTIST (E) PATENTS
COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH.