

1

2,848,348

TEMPORARY IDENTIFICATION LAUNDRY MARKING SYSTEM

Edward A. McCafferty, Cincinnati, Ohio, assignor to The National Marking Machine Company, Cincinnati, Ohio, a corporation of Ohio

No Drawing. Application April 18, 1956
Serial No. 578,877

14 Claims. (Cl. 117—1)

This invention relates to an improved method for providing temporary identification of articles which are to be put through a treatment process and must thereafter be identified with a particular customer or with a particular group of other articles undergoing treatment. The invention also relates to a marking liquid which is adapted for use in connection with my improved identification method. My particular marking system is especially suited for use by commercial laundries which must mark each customer's garments with an identifying mark so as to permit them to be sorted out at the conclusion of the laundering process and made ready for delivery to the customer.

In the past, it has been customary in the commercial laundry industry to mark the garments or other fabric materials to be cleansed with a permanent type of laundry mark which would withstand repeated launderings. This system was satisfactory so long as the clientele of the laundry remained essentially the same from week to week so that the laundry mark assigned to each customer could be continuously identified with that customer and used throughout repeated launderings of the customer's wash articles. Of recent years, however, the character of the commercial laundry business, particularly in large cities, has undergone a decided change. It is now largely a cash and carry type of business in which the customers are serviced through a number of store outlets. As a result, present day laundries have a transient and everchanging body of customers. To accommodate this type of business, there is a need for a temporary or one-trip identification of laundry articles in addition to the permanent, indelible ink type of identification. It has also been found that temporary identification offers a further advantage in that the mark can thereby serve not only to identify ownership of the garment but it can also serve to provide production or lot control during the processing thereof through the laundering plant. In order to be practical, a temporary identification marking system must utilize a mark which will maintain its legibility during a single laundering operation but which is capable of being removed from the garment before a new mark is applied thereto at the outset of the next laundering operation. It is also desirable that the laundry mark be invisible under ordinary light but that it have suitable visibility when flooded with ultraviolet light and that it be readily discernible despite the presence of optical bleach on the fabric or daylight conditions in the plant.

Accordingly, it is an object of my invention to provide an improved method for affording temporary identification of articles which are to be laundered or otherwise processed.

Another object of my invention is to provide a method of temporary identification of laundry articles which includes the removal of any previous marks of temporary nature applied to the articles, and the application of a new identification mark thereto which is capable of being removed after the article has been identified at the con-

2

clusion of the laundering process and before it is again subjected to a further laundering operation.

Another object of my invention is to provide a temporary identification method in which the article to be identified is marked with a quenchable, fluorescent material which can be rendered non-fluorescent after the article has been processed and identified, by applying a specific quenching agent thereto.

Another object of my invention is to provide a process of the type set forth in the preceding object wherein the articles are marked with a liquid containing a metallic oxide phosphor, and the mark is rendered non-fluorescent by applying formic acid or acetic acid thereto.

Another object of my invention is to provide a new marking liquid which includes a quenchable fluorescent pigment and a resinous vehicle therefor.

Another object of my invention is to provide a marking liquid which includes a colorless resin vehicle and a metallic oxide phosphor pigment adapted to be rendered non-fluorescent when treated with a volatile quenching agent.

With these and other objects in view, which will become apparent from the following description, the invention includes certain methods and materials the essential elements of which are set forth in the appended claims and a preferred form or embodiment of which will hereinafter be described.

In connection with my improved one-trip method of identification of laundry articles, I prefer to employ an invisible marking liquid which, when applied to the textile fabrics, will be substantially invisible thereon under ordinary daylight regardless of the color of the fabric.

To enable the mark to function as a means of identification of the garment, the marking liquid has incorporated therein a fluorescent substance which becomes visible when the garment is flooded with ultraviolet light. It is essential that the fluorescent mark be readily discernible irrespective of the color of the textile material or of the presence thereon of optical bleaches which are in themselves fluorescent. It is also necessary that the mark fluoresce with sufficient brilliance to be readily discernible even through considerable daylight or artificial illumination be present. It is also necessary that the marking liquid be of such a character that it will adhere to the fabric regardless of the character of the fibers contained therein, and that it be capable of withstanding the rigors of the laundering process to which the article is to be subjected.

I have discovered a marking liquid which will satisfy all of the above requirements and which may be rendered non-fluorescent, or quenched, after it has fulfilled its purpose, by the application of a suitable quenching agent thereto. The quenching of the old mark or marks is preferably accomplished at the beginning of the laundering process before the new identifying mark is applied to the garment in preparation for the prospective laundering operation. Hence, my novel process may consist in first removing or quenching any prior marks of a temporary character which would be likely to cause confusion with the new, quenchable mark to be applied thereto. The quenching is accomplished by applying a suitable agent to the existing mark which will obliterate the same and thereby prepare the garment for the application of the new mark. The next step in the process is to apply to the garment the new laundry mark which is of a temporary nature so that it may be removed before the articles are again laundered. After the new mark has been applied to the garments, they are then laundered in the usual manner, the mark being of such a character as to retain its identification properties throughout the laundering procedure. After the garments have been laundered, they are reidentified by viewing the marks

thereon under ultra-violet light to enable them to be sorted out into customer categories. This completes the identification and laundering process and the next time the articles are received by the laundry, the operation will be repeated, that is, the existing laundry mark will be quenched and a new mark applied which will serve to identify the garments during the current laundering operation.

Further detailed information with regard to the process and to the materials used therewith will now be given so as to provide a complete disclosure of my new temporary identification marking system.

The marking liquid which I have devised for the purpose of providing temporary identification of the laundry articles consists essentially of a fluorescent pigment and resinous carrier or vehicle therefor. The preferred form of vehicle is a colorless resin of the vinyl or methacrylate type which is mixed with one or more volatile solvents to provide a liquid of the desired consistency. A pigment dispersant is preferably incorporated therein to insure complete dispersal of the pigment throughout the liquid. For the pigment, I prefer to use a zinc oxide phosphor or a zinc oxide-magnesium oxide phosphor, both of which are well known, commercially available, fluorescent pigments. I have found that the fluorescent character of these metallic oxide phosphors can be quickly and readily quenched by the application thereto of a volatile, non-injurious acid such as a dilute solution of formic or acetic acid. More specifically, I have found that a 10-20% concentration of the acid is effective to quench or extinguish the fluorescence of the metallic oxide phosphor.

The following examples, which are set forth by way of illustration, will provide more exact information with regard to the composition of a specific marking liquid which is well suited for use in connection with my method of temporary identification.

General example

	Percent by weight
Acid sensitive fluorescent pigment (phosphor)-----	10-20
Colorless resin-----	10-20
Solvents-----	79-58
Pigment dispersant-----	1-2

Specific example #1

	Parts by weight
Zinc oxide phosphor (New Jersey zinc's fluorescent pigment #2100)-----	16
Methyl methacrylate resin (Rohm & Haas' Acryloid B-72)-----	16
Toluene-----	25
Diethylene glycol monobutyl ether acetate-----	41
Aluminum stearate-----	2

Specific example #2

	Parts by weight
Zinc oxide-magnesium oxide phosphor (New Jersey zinc's fluorescent pigment #2115)-----	15
Vinyl chloride-vinyl acetate copolymer resin (Bakelite's Vylite VYHH-1)-----	8
Cyclohexanone-----	18
Diethylene glycol diethylether-----	28
Diethylene glycol monobutyl ether acetate-----	28
Hydroxycitronellal-----	1
Aluminum stearate-----	2

As heretofore mentioned, the fluorescent character of the above liquids can be removed or extinguished by the application thereto of a dilute solution of a volatile non-injurious acid such as formic acid or acetic acid. The quenching of the mark may be accomplished by merely brushing or sponging the mark with a 10-20% concentration of the cold acid. The treated area can subsequently be neutralized by the application thereto of a volatile base such as ammonium hydroxide and then force dried to hasten the conditioning of the garment for re-marking. With a sufficient lapse of time between the stripping and re-marking operation, the acid will evapo-

rate from the textile fabric and neutralization of the acid will not be necessary. Removal of the acid from the garment can be rendered substantially instantaneous by the application of heat. Thus, the area containing the mark after being treated with cold acid may be touched to a "puff iron" which will cause the acid to instantly react with the metallic oxide and quench the fluorescence thereof. At the same time, the acid will be volatilized and thereby removed from the garment. A preferred method of quenching the mark is to "bleed" the acid into a "steam gun" and apply the acidulated steam to the portion of the garment containing the mark. Both heat and acid are thereby simultaneously applied to the garment and the existing mark or marks will be instantaneously quenched.

The marking liquid will fluoresce with a brilliant yellow color under ultraviolet light and will thereby be clearly visible over the bluish white fluorescence resulting from the use of optical bleach. The mark will fluoresce with sufficient brilliance to permit it to be easily read even though a reasonable amount of natural light is present, and the use of a pigmented mark will provide sharp contrast between the mark and the fabric regardless of the color of the latter. Also, the resinous vehicle of the marking liquid will cause it to adhere satisfactorily to fabrics containing synthetic fibers either alone or combined with natural fibers.

While I have described my invention in connection with one possible form or embodiment thereof, and have used, therefore, certain specific terms and language herein, it is to be understood that the present disclosure is illustrative rather than restrictive, and that changes and modifications may be resorted to without departing from the spirit of the invention or the scope of the claims which follow.

I claim:

1. The method of providing temporary laundry identification of textile articles by use of a quenchable marking liquid containing a metallic oxide fluorescent phosphor which comprises applying a weak volatile organic acid to the marks remaining on the articles from a previous laundering operation to react therewith and obliterate said marks, and applying to each of the articles a new mark of metallic oxide fluorescent phosphor that is capable of being reacted with a weak volatile organic acid to be obliterated thereby.

2. The method of claim 1 in which the quenching means is a weak volatile organic acid that is not injurious to the textile articles.

3. The method of providing a temporary identification of textile articles during a laundering operation through the use of a quenchable marking composition containing a metallic oxide phosphor capable of being reacted with a weak volatile organic acid, said method comprising quenching the marks remaining on the articles from a previous laundering operation by applying thereto a dilute solution of a weak volatile organic acid which reacts with the metallic oxide phosphor and renders it non-fluorescent, and applying to each of the articles a new mark with the quenchable marking composition.

4. The method of claim 3 wherein said phosphor includes zinc oxide phosphor.

5. The identification method of claim 3 wherein said phosphor includes magnesium oxide phosphor.

6. The identification method of claim 3 wherein said acid is acetic acid.

7. The identification method of claim 3 wherein said acid is formic acid.

8. The identification method of claim 3 wherein said acid is applied in the presence of steam to the old mark remaining on the articles.

9. The method of providing temporary identification of textile articles during a laundering operation which comprises marking each of the articles with a marking

5

composition containing metallic oxide fluorescent phosphor capable of being reacted with a weak volatile organic acid, passing the articles through the laundering operation, and then applying to the laundry mark, before the next laundering operation, a weak volatile organic acid for reacting with the marking composition to obliterate said mark.

10. A quenchable laundry marking liquid which is substantially invisible under ordinary light after it has been applied to textile articles which are to be laundered, said liquid containing a pigment consisting essentially of metallic oxide fluorescent phosphor which is sensitive to and capable of being rendered non-fluorescent by reaction with a weak volatile organic acid, and a colorless resinous bonding vehicle for holding the pigment in place on the textile article during laundering.

11. The marking liquid of claim 10 wherein said pigment is zinc oxide phosphor.

6

12. The marking liquid of claim 10 wherein said pigment is zinc oxide-magnesium oxide phosphor.

13. The marking liquid of claim 10 wherein said vehicle is methyl methacrylate resin admixed with a suitable solvent.

14. The marking liquid of claim 10 wherein said vehicle is vinyl chloride-vinyl acetate copolymer resin admixed with a suitable solvent.

References Cited in the file of this patent

UNITED STATES PATENTS

2,073,381	Sell	Mar. 9, 1937
2,086,745	Sell	July 13, 1937
2,097,017	Carothers	Oct. 26, 1937
2,180,508	De Fraigne	Nov. 21, 1939
2,347,644	Sell	May 2, 1944