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METHOD OF APPLYING TINTING LIQUID AND PRODUCT THEREOF

No Drawing. Original application filed March 27, 1928, Serial No. 265,221. Divided and this application filed February 1, 1930. Serial No. 425,350.

This invention relates to a tinting fluid and method of using the same for temporarily marking yarns during their processing.

This application is a division of our application Serial No. 265,221 filed March 27, 1928.

An object of our invention is to provide a fluid for the fugitive tinting of textile yarns for the purpose of identification of the same.

A further object of our invention is to provide a tinting fluid for the temporary marking of yarns, which tinting fluid may be applied to the yarns while the same are running to a bobbin or other packaging device. Further objects of our invention will appear from the following detailed description.

It is a common practice in the textile art to color yarns with an easily removable dye for the purpose of identifying them as to denier, count or size, twist, number of filaments, etc., during textile operations. After a finished product is produced, the color is removed by washing or scouring. Ordinarily simple aqueous solutions of acid dyes (sodium salts of sulfonic acids) are used for this purpose. Usually the yarn is hanked and immersed in an aqueous solution of the fugitive dye. However, this method involves the additional operations of hanking and swift winding and the extra expense and waste entailed by these operations. If attempt is made to apply the fugitive tinting liquid by means of a wick or roller to yarns made of certain materials, and especially to cellulose acetate yarns, while they are running from bobbin to bobbin, poor results are obtained, due to the fact that the yarns retain too large a percentage of water, causing the stretching of yarns when of necessity high tensions are employed, and in all cases where excessive moisture is applied while winding, subsequent loss of the moisture by evaporation, brings about an undesirable softening or slackness of the package of the yarn wound.

We have found that by using a vegetable, animal or mineral oil in the fugitive tinting fluid, the same may be applied to the yarn while it is running from bobbin to bobbin, without causing the undesirable results set forth above.

In accordance with our invention, we prepare a tinting fluid which contains water, a sulfonated oil, a non drying oil and a fugitive dye. This tinting fluid may be applied to the yarn in any suitable manner, but the greatest advantages of our invention are obtained by applying the tinting fluid to the yarn while it is running from bobbin to bobbin by means of a wick or roller. Any suitable sulfonated oil such as Turkey red oil (sulfonated castor oil) or sulfonated olive oil may be used, but sulfonated olive oil is preferred, since this has the least tendency to leave sticky deposits on the apparatus with which the yarn comes in contact.

Of the non drying oils that may be used, the non drying mineral oils, animal oils or vegetable oils are preferred. We have obtained very satisfactory results with the use of a mineral oil such as pariffin or paraffin oil. As an example of an animal oil, neatsfoot oil may be mentioned. Of the vegetable oils castor oil or cotton seed oil may be used. However, we have found that the use of olive oil gives the best results.

The dyestuff that is used may be any suitable dye that produces fugitive tinting on the particular yarn that is to be identified, and which may be readily removed.

The proportion of various ingredients that are used may be varied within wide limits. However, we prefer a tinting fluid of such composition that when the same is applied to the yarn during its passage to a winding and/or twisting apparatus, the yarn does not retain more than the total of about 8% of its weight of oil and water, since if substantially more than this amount is retained, the packages such as cones or bobbins that are obtained are found to be soft. Generally we prefer to use a tinting fluid of such composition that only 3.5% to 5% of oil and water are retained by the yarn. Obviously the strength of the tinting fluid to obtain these results will depend on the linear speed of the yarn, and the variations in the proportions

of tinting fluid necessary to obtain a desired deposition of oil and water on the yarn, may be readily ascertained for the various linear speeds of the yarn.

The proportion of oil, sulfonated oil and water may be varied within wide limits. Thus, 100 parts of the tinting fluid may be made up of from 10 to 50 parts of a mixture of non drying oil and sulfonated oil, from 89 to 49 parts of water and substantially 1 part of concentrated fugitive dye or tint. The mixture of oil and sulfonated oil may be varied within wide limits say, from 3 to 7 parts of sulfonated oil to 1 part of unsulfonated oil. The amount of fugitive dyestuff may be varied in accordance with the nature of the dyes, the depth of tinting desired, the nature of the yarn to be identified, and the amount of tinting fluid applied. For example, 0.5 to 1.0% of dye is suitable for the purpose of identifying yarn in the bobbin, hank or other package. For identifying individual ends in warping, weaving and similar processes, a concentration of about 4% or over of the dye in the tinting fluid is advisable.

The tinting fluid may be applied in any suitable manner such as by immersion of the hanks in the tinting fluid by a roller or by a wick or pad. However, since the greatest advantages accruing from the use of our tinting fluid is obtained by applying the same to yarn while it is running from one textile machine to another, we prefer to apply the tinting fluid by causing the yarn to pass across a wick or pad that is dipping in or otherwise contacting with the tinting fluid, since this method is most economical and involves the use of a very compact tinting fluid apparatus that may be applied to all textile machines without difficulty.

The tinting fluid may be applied to the yarn while it is running from "bobbin to bobbin." The expression "bobbin to bobbin" as used in this specification and in the claims includes not only the literal meaning of bobbin but also includes cones, cheeses, hanks, pirns and other textile packages. The expression also includes the tinting of artificial yarns after their formation, but prior to their being twisted and/or wound. For instance, in the manufacture of cellulose acetate yarn by the dry spinning process, a solution of cellulose acetate in appropriate volatile solvent such as acetone, is passed through the orifices of a spinnerret in a metier or a dry spinning machine into a heated atmosphere and the filaments thus formed are drawn and wound and/or twisted onto an appropriate bobbin or cap-spinning machine. When the tinting fluid made in accordance with our invention is used in connection with the dry spinning process, the fluid is applied to the filaments or yarns on the metier or dry spinning machine just after their exit from the metier casing and just prior to their being twisted and/or wound.

The yarn that may be tinted in accordance with our invention may be of any nature. While this invention presents great advantages in the fugitive tinting of yarns containing organic derivatives of cellulose such as cellulose acetate, cellulose formate, cellulose butyrate and cellulose propionate, ethyl cellulose, methyl cellulose and benzyl cellulose, it may be applied to yarns of other fibres such as silk, wool, cotton, reconstituted cellulose (rayon) flax or composite yarns containing mixtures of these fibres. This invention, however, is particularly applicable to the tinting of cellulose acetate yarns.

In order to further illustrate our invention the following specific examples of tinting fluid are given.

Example I

A mixture of olive oil and sulfonated olive oil having the following constitution is used:

	Per cent
Total oils and fatty acids	56
Unsulfonated oil	11

The tinting fluid may be made up as follows:

	Parts
Mixture of olive oil and sulfonated olive oil	40
Water	59
Fugitive red tint (concentrated)	1

The fugitive tint thus made is a clear solution.

Example II

Using the same mixture of olive oil and sulfonated olive oil described in Example I, a tinting fluid is made as follows:

	Parts
Mixed olive oil and sulfonated olive oil	13
Water	86
Fugitive tint (concentrated)	1

When either of the above tinting fluids is applied to a yarn containing cellulose acetate, while being wound from bobbin to bobbin, the yarn is found to be evenly tinted, the yarn is well lubricated and has a soft handle.

Since the tinting fluid made in accordance with our invention also lubricates the yarn, the yarn treated therewith can be easily worked in textile machines, such as knitting machines, since the yarn is simultaneously tinted and lubricated. The packages thus produced are good and not soft, as would be produced by using a mere aqueous solution of the fugitive tint. The fugitive dyeing thus produced is readily removable, in fact somewhat more so than when the former tinting fluids are used, and the dyeing properties of the cellulose acetate yarn are not affected. By the use of the fugitive

tinting fluid on the cellulose acetate yarn while they are running from bobbin to bobbin, such operations as painting of the packages, dipping of the packages and the expensive method of tinting in the skein form are avoided.

It is to be understood that the foregoing details are given merely by way of illustration and that many variations may be made therein without departing from the spirit of this invention.

Having described our invention what we claim and desire to secure by Letters Patent is:

1. Method of tinting yarns comprising applying thereto a tinting fluid containing a fugitive dyestuff, a non-drying oil and a sulfonated oil.

2. Method of tinting yarns comprising applying to said yarns while in transit from "bobbin to bobbin" a tinting fluid containing a fugitive dyestuff, a non-drying oil and a sulfonated oil.

3. Method of tinting yarns comprising applying to said yarns while in transit from "bobbin to bobbin" a tinting fluid containing a fugitive dyestuff, a non-drying vegetable oil and a sulfonated vegetable oil.

4. Method of tinting yarns comprising applying to said yarns while in transit from "bobbin to bobbin" a tinting fluid containing a fugitive dyestuff, olive oil and a sulfonated oil.

5. Method of tinting yarns comprising applying to said yarns while in transit from "bobbin to bobbin" a tinting fluid containing a fugitive dyestuff, castor oil and a sulfonated oil.

6. Method of tinting yarns comprising applying to said yarns while in transit from "bobbin to bobbin" a tinting fluid containing a fugitive dyestuff, paraffin oil and a sulfonated oil.

7. Method of tinting yarns comprising applying to said yarns while in transit from "bobbin to bobbin" a tinting fluid containing a fugitive dyestuff, olive oil and a sulfonated olive oil.

8. Method in accordance with claim 2 wherein the yarn to be tinted contains organic derivatives of cellulose.

9. Method in accordance with claim 2 wherein the yarn to be tinted contains cellulose acetate.

10. Method in accordance with claim 4 wherein the yarn to be tinted contains cellulose acetate.

11. Method in accordance with claim 7 wherein the yarn to be tinted contains cellulose acetate.

12. Yarns tinted with a fugitive tinting fluid containing a sulfonated oil.

13. Yarns tinted with a fugitive tinting fluid containing a non-drying oil and a sulfonated oil.

14. Yarns tinted with a fugitive tinting fluid containing olive oil and a sulfonated oil.

15. Yarns tinted with a fugitive tinting fluid containing olive oil and sulfonated olive oil.

In testimony whereof, we have hereunto subscribed our names.

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