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CRAYON FOR MARKING TEXTILE MATERIALS AND THE LIKE

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This invention relates to crayon for marking textile material and the like and is a continuation-in-part of my co-pending application, Serial No. 392,949. While its use is not necessarily limited to cloth, for the purpose of illustration the invention will be described herein in connection with its application to cloth.

Crayon is extensively employed at various stages in the manufacture of yarn and cloth; for marking the cloth to indicate imperfections, etc., and for marking wound bobbins to indicate the nature of the twist of the yarn, the combination of threads, etc., different colors being used as indicators of various conditions.

Obtaining suitable crayon for such purposes has always presented a problem. It is desirable that the crayon be strong and durable so that it will not crumble when applied, to cloth or yarn, for example, but will make a mark which is clearly discernible. At the same time it is highly important that the crayon be readily removable from the yarn or cloth. Crayons heretofore available for marking textile material or the like have not combined these attributes in a satisfactory manner.

Some crayons soon glaze over and become extremely hard, and thus fail to make a clearly discernible mark.

Many crayons, when wetted by water or steam, "set" into the fibers of the yarn or cloth and can thereafter be removed only with great difficulty, and if not removed before dyeing they cause uneven dyeing. Since, in the manufacture of textile material and the like the cloth or yarn which has been marked with crayon is regularly subjected to the steps of (1) steaming, (2) scouring, with water and soap, or chemical bath, and (3) rinsing, it will be understood that the marks of such crayon present a serious practical problem.

An object of my invention is to provide an effective and durable article of the above mentioned kind and a simple method of making the same.

Another object of my invention is to provide a crayon which will be readily water soluble.

Another object of the invention is to provide a crayon which may be used for marking cloth during the various stages of the manufacture of yarn and cloth, the marks of which will be removed from the cloth during the usual steps of treatment which follow the application of the crayon to the cloth or yarn.

Another object of the invention is to provide a crayon which will mark cloth, including wool and worsted cloth, without glazing, and without "setting" into the cloth.

Another object of my invention is to provide a strong, durable, water soluble crayon which does not necessarily require the use of a binder such as glycerine or its equivalents.

Another object of my invention is to provide a crayon for marking cloth with an effective water dispersing agent.

Other objects will be in part obvious or in part pointed out hereafter.

The invention accordingly consists in the combinations of elements, arrangements of parts, and in the several steps and relation and order of each of said steps to one or more of the others thereof, all as will be pointed out in the following description, and the scope of the application of which will be indicated in the following claims.

According to my invention I make a crayon, with or without a binder, such, for example, as glycerine, employing a water dispersible color carrier, the desired dye, water, and a phosphate salt. I employ the phosphate salt primarily as a water dispersing agent. I have found that by employing a phosphate salt I am able to obtain a crayon of suitable strength and durability for practical use which will mark the cloth without glazing, and which marks cloth or yarn with a deposit which will not be "set" into the cloth, but which will be readily removed from the cloth during the usual steps of treatment which follow the application of the crayon marks to the cloth or yarn.

I prefer to use a phosphate salt which is slightly alkaline, such, for example, as dipotassium phosphate, or disodium phosphate, to serve both as a water dispersing agent and to overcome the natural acidity of some fibers, such as wool fibers for example, to prevent chemical reaction between the dye and the fibers during steaming. It will be understood however that a non-alkaline phosphate salt may be used and a small amount of alkaline material, such, for example, as sodium carbonate or sodium hydroxide added separately to overcome the aforesaid natural affinity of some fibers for acid and to provide a medium adapted for most effective action of the said water dispersing agent. It is simpler and therefore preferable to get both the dispersing action and the desired degree of alkalinity from a single substance, but obviously if a less alkaline phosphate salt is used, such, for example, as a mono-phosphate salt, its alkalinity may be supplemented by the addition of a small amount of a mild alkaline material such as sodium hydroxide, and thus also if a phosphate salt is used which has somewhat greater alkalinity than is preferred, such, for example, as a tripotassium salt, its alkalinity may be reduced to the extent desired by the addition of an acid material which will not injure the cloth, such, for example, as acetic or formic, or any organic acid.

The phosphate salt should be used in sufficient volume to readily disperse the color carrier, and, if an alkalizing agent is employed, it should be

limited to an amount, say 0.5% which will not increase the pH value of the composition to an extent such that it will destroy the dye used or injure the fabric.

I have obtained very satisfactory results employing the following formula:

Ingredients	Proportions based on wt. of color carrier used
	Per cent
As color carrier: Bentonite, 1%-10%; infusorial earth, 20%-85%; and clay, 5%-79%-	
Disodium phosphate	1-10
Water	40-150

I have found that in the above stated formula I do not need to employ a binder such as glycerine or its equivalents.

Instead of the di-valent phosphate salt a monovalent or tri-valent salt may be used and an alkalizing or acidulating agent added as required, as stated above.

Instead of the combination of bentonite, infusorial earth and clay I may use any other suitable water dispersible color carrying material, such for example, as clay, or fuller's earth, or either of them combined with bentonite, or infusorial earth, and I may use a binder, such, for example, as one selected from a group comprising glycerine, the glycols, and glucose, or diglycol stearate. Thus combinations illustrated by the following formulae, and in which the relative proportions of mixed color carriers are merely illustrative and can be widely varied, may be employed:

Ingredients	Proportions based on wt. of color carrier used
	Per cent
As color carrier: Clay or fuller's earth	
Water	40 to 70
Color	0.2 to 0.6
Glucose	5 to 15
Dipotassium phosphate	1 to 5
Preservative	0.1 to 0.5

Ingredients	Proportions based on wt. of combined color carriers used
	Per cent
As color carrier: Fuller's earth and bentonite (90-10)	
Water	40 to 70
Color	0.2 to 0.6
Glucose	5 to 15
Dipotassium phosphate	1 to 5
Preservative	0.1 to 0.5

Ingredients	Proportions based on wt. of combined color carriers used
	Per cent
As color carrier: Infusorial earth and clay (50-50)	
Water	100 to 150
Color	0.2 to 0.6
Diglycol stearate	5 to 15
Dipotassium phosphate	1 to 5
Preservative	0.1 to 0.5

In combining two or more color carriers in the same formula the relative proportions may be varied for optimum results, depending on the particular ingredients selected. For example, in combining bentonite with another color carrier I prefer to use approximately 10% to 20% of bentonite and from 80% to 90% of a color carrier such as infusorial earth.

In making my crayon I dissolve the desired dye in a small quantity of water. To the solution thus formed I add the selected phosphate salt, the alkalizing or acidulating agent, if one is used, the binder, if one is used, and I prefer to add a preservative, such, for example, as sodium benzoate. I place this mixture in a high power mixer and then add the color carrying material, and the water, and thoroughly mix the ingredients, which may require approximately one-half hour.

When the mixing operation is completed, I transfer the material into suitable molds, or eject it, preferably in cylindrical form, from a suitable forming machine, and cut it to desired lengths. The molded material I then place in a suitable dryer, and dry to the hardness desired. The length of the drying operation will vary considerably according to the dryness desired of the finished product. Thus the drying may vary from one-half hour to four hours for crayons dried down to from seven to sixteen percent moisture.

The infusorial earth requires more water than fuller's earth or clay, for example, to bring it into condition to combine with the other ingredients. The proportion of water should therefore be varied in accordance with the amount of infusorial earth used.

In employing diglycol stearate as a binder, as illustrated in the above formula, I combine diglycol stearate and water in the approximate proportion of 90% of diglycol stearate and 10% of water, and add this combination to the dye solution. I then add the water dispersing agent, and after placing the mixture thus formed in the mixer I add the color carrying material or materials, and a volume of water based upon the weight of the color carrying material.

I have found that not all colors are satisfactory for use in making my improved crayon due to the fact that many of them, after being incorporated in a crayon, change color when the crayon is dried. I have found that the following water soluble colors may be employed in the manufacture of my crayon with very satisfactory results.

Selected colors	Color index No.
Calcocid fast Green 10G	13 PR
Pontacyl Blue BL	833
Calcozine Red B	843
Calcocid Milling Yellow R	187 PR
Calcocid Brown RDEX	235
Nigrosine W S B #50	865

I do not limit myself to these colors but cite them merely as colors which are now commercially available and which I have used and found satisfactory.

It will thus be seen that there has been provided by this invention a method and a product in which the various objects hereinabove set forth together with many thoroughly practical advantages are successfully achieved. As various possible embodiments might be made of the features of the above invention and as the art herein described might be varied in various parts, all without departing from the scope of the invention, it is to be understood that all matter hereinbefore set forth is to be interpreted as illustrative and not in a limiting sense.

What I claim is:

1. The method of making a crayon which comprises mixing a water dispersible color carrier, selected from a group consisting of clay, fuller's earth, infusorial earth, combinations thereof and mixtures thereof with bentonite, in a water solution with a phosphate salt selected from a group consisting of potassium and sodium phosphate, adding sufficient dye to give the desired shade, and drying the product to the desired degree of hardness.

2. The method of making a crayon which comprises mixing a water dispersible color carrier, selected from a group consisting of clay, fuller's earth, infusorial earth, combinations thereof and mixtures thereof with bentonite, in a water solution with a phosphate salt selected from a group consisting of potassium and sodium phosphate in a proportion of from 1%–10% of the weight of the color carrier, adding sufficient dye to give the desired shade, and drying the product to the desired degree of dryness.

3. The method of making a crayon which comprises mixing a water dispersible color carrier selected from a group consisting of clay, fuller's earth, infusorial earth, combinations thereof, and mixtures thereof with bentonite, water in an amount within a range on the order of 40%–150% of the weight of the color carrier used, a phosphate salt selected from the salts of potassium and sodium phosphate in an amount within a range on the order of from 1%–10% of the weight of the color carrier, and color in an amount sufficient to give the desired shade, and thereafter molding the material obtained as a result of the mixing operation and drying it to the hardness desired.

4. A crayon comprising a water dispersible color carrier selected from the group consisting of clay, fuller's earth, infusorial earth, combinations thereof, and mixtures thereof with bentonite, a phosphate salt selected from the salts of potassium and sodium phosphate in an amount within a range on the order of from 1%–10% of the weight of the color carrier, a binder selected from a group consisting of glycerine, the glycols, glucose, and diglycol stearate in an amount within a range on the order of from 5%–15% of the color carrier, and color in an amount sufficient to give the desired shade.

5. A crayon comprising a water dispersible color carrier selected from the group consisting of clay, fuller's earth, infusorial earth, combinations thereof, and mixtures thereof with bentonite, a phosphate salt selected from the salts of potassium and sodium phosphate in an amount within a range on the order of from 1%–10% of the weight of the color carrier, and color in an amount sufficient to give the desired shade.

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