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PRINTING COLORS AND A METHOD FOR MANUFACTURING THE SAME

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This invention relates to a method for the manufacture of printing colours, to the products resulting therefrom, and to their uses in the art.

In the specification of patent No. — — the applicant has described a method for the production of printing colours which essentially consists in grinding a siccative glycerophthalic rosin, after which the so obtained pigmented enamel is emulsified in water. Owing to the fact that the preparation of the emulsion takes place only after grinding of the pigment with a solution of the siccative glycerophthalic rosin, the pigment is perfectly coated with the latter, which results in giving decorative effects which are very fast and resistant to washing as well as to rubbing.

In the specification of patent No. — — a practical embodiment of the above mentioned method has been described which consists in effecting the grinding and emulsifying operations with such proportions of the substances used that the colour is obtained in the form of a concentrated paste suitable for being brought to the desired viscosity when it is to be utilized by the addition of diluents which do not destroy the emulsion. In the above mentioned patent No. — — the possibility of incorporating siccatives with the printing colour either in the course of the grinding operation or during the diluation of the colour has also been provided for.

The present invention relates to novel changes and improvements in the method according to patent No. — —.

According to one of the improvements which constitutes an object of the present invention, it has been found by Messrs. André Durr and Richard Gardedieu in the laboratories of the applicant that it was possible, by a judicious selection of the kind of rosin, to obtain printing colours which can be dried under the broadest conditions of time and temperature, while offering an excellent resistance to rubbing and soaping and more particularly to alkaline soaping under boiling conditions.

When printing with a colour formed by an emulsion in water of a pigmented glycerophthalic rosin, the emulsion is destroyed; the water impregnates the fiber and the pigmented glycerophthalic rosin remains on the surface of the latter. When drying, the water leaves the fiber and passes through the rosin film which oxidizes and which will continue to oxidize according to a process which can be designated by the name of fixing. If, throughout the period of time during which the water is eliminated, the glycerophthalic film remains sufficiently plastic, the ulterior fixing of the latter causes the formation of a smooth and homogeneous film on the surface of the fiber; if, on the contrary, the film dries too quickly, the elimination of the water crackles the pigmented rosin film, and the film, after fixing, is coated with a more or less spongy layer; it is easy to understand that under these conditions the printing obtained resists less to rubbing than that obtained with a smooth and homogeneous film.

Consequently, in order to obtain a maximum resistance it is necessary either to control the drying and fixing conditions or to choose kinds of rosins which give a plastic film during the whole time the water is being eliminated irrespective of working conditions. This latter result has been obtained according to the present invention by resorting to glycerophthalic rosins which when exposed to air dry slowly in depth, and are of an oil-long type, and more particularly to glycerophthalic rosins possessing these characteristic features and which are produced from soya-bean oil.

The products obtained according to the present invention allow, after printing, of drying and fixing under the broadest conditions: exposing to air for 20 to 48 hours will be sufficient for giving prints which resist rubbing and alkaline soaping well; it will be possible, immediately after printing to dry for a few minutes in a drying-room at temperatures of 60 to 100° C. in order to eliminate the water and, before effecting a fixing operation, to roll or pile up the printed pieces.

The specification of patent No. — — also states as has already been mentioned above that the glycerophthalic rosin is ground with a pigment, possibly in the presence of solvent for this rosin, and that the so obtained pigmented enamel is emulsified in water. However, in the different practical embodiments given in the said specification, the rosin is always ground with the pigment in the presence of a solvent; now, by the present invention, another form of execution may consist in submitting the mixture of rosin and pigment to an intensive mechanical working in the absence of a solvent until the pigment has been sufficiently dispersed in the rosin; this mechanical working can be effected, for example, in a calender. Then the dispersion of the pigment in the rosin is emulsified in water.

However, the siccative glycerophthalic rosins which are used for carrying out the invention as described in the specification of Patent No. can be prepared, as specified, according to any known method; according to the indications in

Patent No. they must at least contain radicals of phthalic acid, of glycerine and of siccative fatty acid, but they also contain radicals of other polybasic acids, of other polyalcohols, of monoalcohols or of monobasic acids other than siccative fatty acids. Now, it has been found, according to the present invention, that it is possible to replace the totality of the glycerine by other polyalcohols such as glycol, pentaerythrite, thiodiglycol, butanediols, and the totality of the phthalic acid by other polyacids such as maleic acid, succianic acid, citric acid, while choosing however, according to the current technic of the manufacture of rosins of the "polyalcohol-polyacid" kind, such proportions or such mixtures of the said bodies, that the properties of the rosins are similar to those of the siccative glycerophthalic rosins. In a like manner, one would not depart from the scope and spirit of the invention by using composite rosins of the kind comprising polyalcohols, polyacids, siccative fatty acids and other resinous substances, the properties of which are similar to those of the siccative glycerophthalic rosins.

Several non-limitative examples will be given.

Example I

100 parts of glycerophthalic rosin basically composed of soya-bean oil the global composition of which obtains 60% of oil are ground in the grinding mill, after an addition of white spirit, with 10 parts of a pigment known on the market under the name of "Monastral Blue BS" so as to obtain a pigmented enamel of the following composition:

	Parts
Rosin	100
White spirit	100
Monastral Blue BS	10

This pigmented enamel is added little by little to a solution of:

	Parts
Methylcellulose	15
Triethanolamine	5
Water	135

A concentrated printing colour is thus obtained which may if desired be again passed through a grinding mill. To this colour are added while stirring:

100 parts of xylene, and slowly
255 parts of water.

A printing colour is then obtained which is ready for use.

After printing, the fabric is dried for 5 minutes at 60–100° C. in order to eliminate the water and is then piled up or rolled up.

The fixing can be obtained either by exposing for 24 hours in free air or by passing through a drying-room. By way of indication one may proceed to a drying operation in a drying-room for 20 minutes at 120° C. or 6 minutes at 160° C.

Under these conditions impressions are obtained which hold fast with respect to rubbing and to alkaline soaping under boiling conditions.

Example II

100 parts of a glycerophthalic rosin basically composed of soya-bean oil and the global composition of which obtains 57% of oil are ground, after an addition of white spirit, with 10 parts of the pigment known on the market under the name of "Monastral Green GS" so as to obtain a coloured enamel corresponding to the following composition:

	Parts
Monastral Green GS	10
Rosin	100
White spirit	100

This pigmented enamel is added little by little, while stirring, to 150 parts of a thick suspension of bentonite of 8.25% to which 5 parts of triethanolamine may or may not be added; a concentrated printing colour is thus obtained. To this colour are added while stirring:

100 parts of xylene, and then slowly
255 parts of water.

A printing colour ready for use is thus obtained.

After printing and exposing the fabric to air for 24 hours impressions are obtained which hold fast when the fabric is submitted to boiling alkaline soaping and rubbing.

Of course, drying operations in the drying-room over suitable periods of time lead to equivalent results.

Example III

100 parts of a glycerophthalic rosin basically composed of soya-bean oil and the global composition of which obtains 60% of oil are ground after an addition of white spirit with a pigment paste known on the market by the name of "Lutecia Scarlet NRF" corresponding to 50 parts of dry pigment, so as to produce an enamel comprising:

	Parts
Lutetia scarlet NRF	50
Rosin	100
White spirit	100
Water	100

This pigmented enamel is added little by little, while stirring, to 150 parts of a thick suspension of bentonite of 8.25% to which 5 parts of triethanolamine may or may not be added. To the so obtained concentrated colour are added, while stirring:

125 parts of white spirit and then slowly
155 parts of water.

A printing paste ready for use is thus obtained.

After printing the fabric is passed through a drying-room for 5 minutes to remove the water and allow a possible rolling or piling up.

The fixing can be effected either by exposing to air or by passing through a drying-room. By way of indication, the fixing time is 48 hours when spreading out, and 20 minutes at 120° C. or 6 minutes at 160° C. when passing through the drying-room.

Example IV

100 parts of a rosin prepared by condensation of soya-bean oil, phthalic anhydride, maleic anhydride, pentaerythrite and glycol and the global composition of which obtains 57% of oil are ground in a grinding mill, after an addition of white spirit, with 50 parts of iron oxide in order to obtain an enamel having the following composition:

	Parts
Iron oxide	50
Rosin	100
White spirit	100

This pigmented enamel is added little by little to a thick solution of bentonite of 8.25% to which 5 parts of triethanolamine may or may not be added. A concentrated printing colour is thus

obtained. To this latter are added, while stirring, 70 parts of white spirit and then slowly 255 parts of water. A printing colour ready for use is thus obtained.

The viscosity of this printing paste can be made to vary, (as well as, as a matter of fact, the viscosity of the printing pastes described in the foregoing examples) by cautiously adding an organic solvent (diluant) or water (thickening agent). After exposing the fabric to air for 24 hours impressions are obtained which resist alkaline soaping and rubbing well. Drying operations in a drying-room for periods of time determined by preliminary trials lead to equivalent results.

Example V

100 parts of a glycerophthalic rosin basically composed of soya-bean oil and deshydrated castor oil the global composition of which obtains 75% of oil are ground in a grinding mill (which may be heated) with 10 parts of "Monastral Blue BS" so as to obtain a ground mass having substantially the following composition:

	Parts
Rosin	100
Monastral Blue BS	10

This pigmented enamel is added little by little to a solution of

	Parts
Methylcellulose	15
Triethanolamine	5
Water	135

A concentrated paste is thus obtained the viscosity of which is adjusted before using by adding the required quantity of water.

After printing, the fabrics are treated in the same manner as in the foregoing examples and impressions are obtained which resist boiling alkaline soaping and rubbing well.

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