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TEMPORARY SUPPORTS, THEIR PREPARATION AND THEIR USE IN DRY DYEING AND IN DRY PRINTING BY HOT TRANSFER

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U.S. Cl. 8—2.5 17 Claims

ABSTRACT OF THE DISCLOSURE

Strips, sheets or tapes of flexible, heat-stable material, preferably of paper or of paper backed with an aluminium foil, and characterized in that one of their faces is completely or partially covered in any order with at least two thin layers of organic materials, one, called the colored layer and consisting essentially of dyestuffs and/or optical bluing agents which pass in to the vapor state at between 160 and 220° C. at atmospheric pressure, and of binders which are stable in this temperature range and soluble in the organic solvents present in the inks used to form the colored layer, and the other layer consisting of an albuminoid material which is stable to heat in this temperature range, which can be sensitized to light when it is upon a colored layer and which is preferably non hardened when it is between the surface of the paper and a colored layer, and a process for dry dyeing synthetic materials, characterized in that said supports are applied to the material to be dyed or printed and in that the whole is heated at between 180 and 210° C.

The present invention relates to temporary supports and their use in the printing and dyeing of synthetic materials.

It is known that it is possible to print textiles and other plane surfaces of synthetic material by hot transfer of the pattern or design previously printed on a temporary support usually consisting of paper optionally backed with an aluminium foil (French Pat. 1,223,330). If aqueous inks are used in this process, a certain number of problems which are difficult to solve arise for the paper printer, such as the proportions of the dispersion agents for the dyestuffs in the water, the length of time taken by the temporary support, heavily soaked with water, to dry, and the difficulty of bringing the designs into register as a result of the lack of dimensional stability of papers in the presence of water. For all these reasons and for others as well, the process employing aqueous inks has been abandoned in favor of a process using inks in organic solvents. The latter has considerable advantages, principally during the drying of the temporary supports, and in the recovery and re-use of the excess inks, the bringing of the colors into register and the like. This process, which uses anhydrous or almost anhydrous inks, also allows the work to be carried out on printing machines of great width (up to 180 cm., in place of 80–100 cm. for the process using aqueous inks) and the speeds of printing can be considerably increased as a result of the smaller input of heat necessary for the drying. Whilst the process by the aqueous method gives temporary supports which are often sticky and sensitive to moisture, even just to the dampness of the hands of the personnel who handle them, the process using anhydrous inks described in French Pat. 1,585,-119 gives supports which are non-sticky and insensitive to moisture, and which do not have a tendency to deteriorate even during prolonged storage.

However, in using the processes mentioned above, it was found that the quality of the transfer, that is to say the amount of dyestuff which passes effectively from the

temporary support to the permanent support, depends largely on the nature of the temporary support. Now, the present invention has, among other advantages, that of providing a very simple means of improving this quality.

In effect, it describes the use of new temporary supports in printing and dyeing by hot transfer. As with the known supports, the latter have a layer in a single color or a design printed with one or more dyestuffs and/or optical bluing agents, all of which sublime or vaporize at between 160 and 220° C. at atmospheric pressure. However, they differ from the known supports in that they also have at least one layer of material which is impermeable to the vapor of the dyestuffs or the optical bluing agents used, either in the form of an under-lacquer which separates the said print from the base of the support, or in the form of an over-lacquer which partially covers the colored layer. These new temporary supports thus comprise, on at least one of the two faces of a base sheet, tape or strip, which is inert and stable to heat, for example of paper optionally backed with an aluminium foil, in any order, at least two thin layers of organic materials (which completely or partially cover this face), the one comprising volatile or sublimable dyestuffs (and/or an optical bluing agent), which form the design to be transferred, and the other consisting of an albuminoid material or of another protein material which is stable to heat and soluble or able to be dispersed in water, or even in a mixture of water and organic solvents, for example alcohol. Gelatines from other sources can also be used, such as glue stock, fish glue, light-colored gelatines, or albumin, ovalbumin, and at times even casein or zein (the latter can be applied from anhydrous solutions) or their mixtures.

The present invention also relates to a process for the preparation of temporary supports defined above. This process consists of coating, by any suitable means, at least one of the faces of a sheet or a tape which is inert and stable to heat, for example a strip of paper or cellophane, successively with a layer, with no breaks in it, of a substance which is impermeable to the vapors of dyestuffs and optical bluing agents, for example a layer of albuminoid material, and with a colored layer. By colored layer, there is to be understood in this context a layer containing, either in a uniform manner or in the form of a design, one or more dyestuffs or optical bluing agents which volatilize or sublime at between 160 and 220°, preferably at between 180 and 210°, at atmospheric pressure.

If this preparation process is used to apply a pre-lacquer (or under-lacquer), it results in the formation of a uniform varnish which is impermeable to the vapors of the dyestuffs and bluing agents used, located between the base of the support and these dyestuffs or bluing agents; it thus allows the dyeing yield to be substantially increased, any unevenness in the printing due to a possible lack of uniformity in the base of the temporary support to be avoided, which is a valuable advantage in the case of a uniform print and also permits cheaper papers to be used, and their quality, and thus their origin, to vary during manufacture, and certain disadvantages due to storage to be eliminated. For example, if the temporary support is stored in rolls, the back and the front face are in contact; it is thus possible for staining of the back to occur by dyestuff located on the front face, and, during the transfer, this blotch of dyestuff passes through the temporary support (if the latter does not comprise a backing aluminium foil), and is printed on the final support, thus causing a defect.

The coating of the support before the design or the uniform layer of dyestuff or optical bluing agent is printed on it, can be carried out on the usual equipment. It is possible, for example, to carry out a pass on a separate varnisher, and thereafter to carry out the printing or the dyeing proper on a printing machine with ordinary cylinders. It is possible also to use only one printing ma-

chine equipped with an additional cylinder located in front of the engraved cylinders which print the design to be transferred, or in front of the inking cylinder which prints the uniform layer. It is preferable to work on an independent machine or to provide a separate coating roller for the impermeable layer because the albuminoid materials used are not soluble in anhydrous or nearly anhydrous solvents; thus it is necessary to use an aqueous solution and to apply it independently of the colored or whitening layer.

In effect, the albuminoid material is applied to the paper in solution or dispersion preferably in water to which an organic solvent, for example, an alcohol, has optionally been added, at the rate of 0.5 to 6 and preferably 1 to 3.5 g. per square metre, yielding a coating fully impervious to the dyestuffs vapors.

An intermediate drying, carried out after the coating with the albuminoid material and before the printing or the dyeing, prevents the pre-lacquer from interfering with or having an influence on the subsequent transfer. This drying is facilitated in the case of a coating with a colloidal aqueous ink containing an organic solvent, for example an alcohol.

The only modification to the equipment compared with the known process is thus the introduction of an additional coating cylinder or a varnisher, which covers the temporary support with a thin albuminoid layer, 0.5 to 50 microns (preferably 1 to 10 microns) thick. The dyeing or the pattern to be transferred is then printed according to the usual technique, which will be described later, directly on this layer. A considerable time interval can elapse between the two treatments. The paper, coated with the desired layer of albuminoid material, for example, paper coated with gelatine, can even be stored, and the preparation proper of the temporary supports which are the subject of the present invention need not be carried out until much later by printing with the sublimable dyestuff or dyestuffs or optical bluing agent or agents.

The process which is the subject of the present invention can also be used to apply an over-lacquer, because the albuminoid varnish forms a barrier to the vapors of the dyestuffs and to those of the optical bluing agents used, which is perfectly effective up to at least 220° C., the maximum temperature at which the transfer is carried out. In this case, this varnish is no longer applied over the entire surface of the support, which would have no sense, but instead is printed according to a given pattern, thus producing resists, in a simple, effective and economic way.

For printing a pattern with the help of albuminoid materials on the support which already carries a colored layer, the usual equipment can be used, by simply placing the corresponding coating cylinder after the inking cylinder or cylinders which print the colored layer on the paper, and by providing a drying device. It is also possible to use one of the numerous mechanical printing machines known such as the so-called "air-bed" machine, a machine used in photogravure, in rotogravure and the like. As in the case of the pre-lacquer, it is preferable to work on a machine independent of the equipment used for the printing or the dyeing to be transferred, taking account of the use of aqueous solutions to apply the resists of albuminoid materials. These solutions have the same composition as those which have been defined in the case of the pre-lacquer.

These resists can be printed on supports which already carry a pre-lacquer of albuminoid materials under the design or the uniform layer to be transferred.

Furthermore, this process also offers the possibility of overprinting a colored pattern on the pattern of the over-lacquer of albuminoid materials, which permits colored resists or patterns in color to be obtained on a white resist, thus making more flexible the production of the design to be transferred. Among other advantages, this method of operating allows the sharpness of the printing of colored patterns on a light resist to be improved. The print, the resist and then the overprint can be applied at different times. Thus, a pattern already printed on the temporary support can subsequently be modified or completed, which is a valuable advantage for articles which must be adapted to the demands of fashion, and the production of which must adapt rapidly to a demand which is often unforeseeable.

In a manner analagous to the case of the pre-lacquer, the only difference from the known process is thus the printing of a pattern produced with an albuminoid material on the support which has already been treated with dyestuffs or bluing agents defined later.

In order to print these resists on the pattern or the dyeing to be transferred, it is not necessary to have, for example, a photogravure machine or an engraved cylinder according to the pattern to be given to the resists. As in the case of the pre-lacquer, it is possible to coat uniformly with albuminoid varnish the support which has already been treated with the dyestuffs or the optical bluing agents which will be defined later, and which has optionally been treated with an under-lacquer, and then to insolubilize this varnish locally according to the pattern to be reserved by one of the numerous chemical or photochemical processes which are known, to wash the support in order to make this pattern appear and to dry it, thus achieving the same result as in the preceding paragraph. Amongst the known processes for obtaining a latent image from colloids, it is preferable to consider those which make use of the action of light on the albuminoid material sensitized to this action, for example, the insolubilization of gelatine, albumin or casein bichromate by light, followed by a stripping in luke-warm (30–50°) or cold water, to which, for example, urea or thiourea has been added; on the other hand, another process is the solubilization by light of gelatin or casein which has previously been insolubilized by ferric chloride, a diazo compound, sodium cellulose-glycollate or sodium cellulose-oxyethane-sulphonate, followed by a stripping in acidified water.

For example, a coating produced with gelatine containing 2 to 50% of potassium dichromate can be exposed to a light, the radiations of which are especially between 355 and 425 millimicrons, behind a plate on which the pattern to be reserved is produced as a transparency. The potassium dichromate can be combined with a ferric oxalate, or can be replaced by ammonium, quinoline or pyridine dichromate. Since the sensitivity maximum occurs at the isoelectric point of gelatine, the operation is preferably carried out in the presence of an organic acid or its salt, for example, potassium citrate. During the drying which follows the coating, the drying is stopped preferably at a moisture content of about 14%, which removes the risk of having a brittle layer or a layer of reduced sensitivity or a layer which is less able to be stored.

As this method of operating necessitates a washing in order to strip the image obtained, it is preferable to use, for the temporary support, a base of paper backed with an aluminium foil or a base of paper carrying an albuminoid sublacquer which is insoluble under the stripping conditions. This method of stripping is made possible by the use of dispersion dyestuffs which are practically insoluble in water.

The possibility of superimposing on the same final support designs transferred from several temporary supports in different colors and of obtaining variations in tone by varying the thickness of the colloid layer and hence its permeability to dyestuff vapors, allow, for example, an easy photographic reproduction in color on synthetic materials. Thus, for example, by using three supports according to the present invention, each of which carries a uniform layer of a dyestuff, yellow in the first case, red in the

second and blue in the third, covered by a layer of dichromate-treated gelatine which is also uniform, it is possible to copy colored photographs, provided that the usual filters known in photographic technique are used. It goes without saying that it is necessary to make sure that the patterns are brought into very exact register during the exposure to light of the three supports according to the invention as well as during the recomposition of the image from these three supports, that is to say during the transfer of the three dyestuffs onto the final support; the latter can equally well be a piece of textile as a film or a sheet of synthetic material such as a polyamide, a polyacrylonitrile or a polyester, which is preferably linear.

Recourse to the printing of albuminous masks allows the use of engraved cylinders to be reduced and even avoided. Thus, by successive coating of the support with a uniform layer and then with an albuminous dichromate layer exposed across a transparency rendered opaque in accordance with the negative of the resist to be obtained, then stripped and dried, a white resist on a uniform background is obtained after transfer without having had course to an engraved cylinder. In the same way, it suffices to print a uniform support in accordance with the desired pattern, using an albuminous ink, and to over print it with the same engraved cylinder in order to obtain a design in two colors with a single engraved cylinder. Finally, if the design to be transferred does not present any great difficulties of bringing it into register, it can be advantageous to produce a two-colored design by transfer from two temporary supports carrying a uniform print overprinted with resists obtained photomechanically, and, as a result, to save the engraving of two cylinders.

The printing, on the temporary support, of a uniform layer or of a design using dyestuffs or optical bluing agents which sublime or vaporize at between 160 and 220° C. is carried out according to the known process, described, for example, in French Pats. 1,585,119, 1,574,528 and 1,223,330, preferably by application of anhydrous or almost anhydrous inks, that is to say, solutions, varnishes, emulsions or dispersions, completely or almost completely free of water, which contain, dissolved or very finely dispersed, a dispersion dyestuff which passes into the vapor state at between 160 and 220° C. at atmospheric pressure, an anhydrous or almost anhydrous organic solvent and a binder or thickener which is stable to heat. By sublimable dyestuffs, there must be understood in this context, as in the known process, dyestuffs, preferably dispersion dyestuffs, which pass into the vapor state at between 160 and 220° at atmospheric pressure; these dyestuffs can be, for example, sublimable azo or anthraquinone dyestuffs or nitroarylamines, styryl dyestuffs, derivatives of quinophthalone, perinones and the like. 1,4-dimethylaminoanthraquinone, brominated or chlorinated 1,5-diamino-4,8-dihydroxyanthraquinone, 3-hydroxyquinophthalone, 1-hydroxy-3-phenoxy-4-aminoanthraquinone, 4-(4'-methyl-2'-nitrophenylazo)-3-methyl - 5 - pyrazolone and 1-amino-2-cyano-4-anilido-anthraquinone will be especially mentioned, as well as the dyestuffs, the behavior of which from 180° to 210° is very similar, for example, the propyl or butyl ester of 1,4-diaminoanthraquinone-2-carboxylic acid, 1-amino-2-cyano-4-cyclohexylaminoanthraquinone and 2-hydroxy-5-methyl-4'-acetylamino-azobenzene.

As in the usual process, almost anhydrous organic solvents are used in order to prepare the inks intended to form the colored layer of the new supports according to the invention. By almost anhydrous organic solvents, there are understood in this context solvents or mixtures of solvents which are miscible or immiscible with water, and the boiling point of which is less than 120° and preferably less than 105° C. at atmospheric pressure. These solvents must contain less than 15% of water. By way of examples of such solvents, there may be mentioned halogenated or non-halogenated hydrocarbons of the aliphatic or aromatic series such as toluene, cyclohexane, petroleum ether, alcohols of low molecular weight such as methanol and ethyl, propyl and isopropyl alcohols, esters of aliphatic acids such as ethyl acetate, ketones such as methyl ethyl ketone and the like.

The thickening agents or binders which are stable to heat, that is to say which do not decompose in the heat at which the transfer according to the present invention is carried out, are available commercially and are widely used for the direct printing of textiles, but it is expedient to choose them from amongst those which have a low content of solid substances. They must be capable of drying to give a non-sticky film which holds the dyestuff or dyestuffs used. Inert binders, which have relatively little or no tendency to decompose, and which only hold the sublimable substances used onto the paper without modifying the substances are preferably used. By way of example, there will be mentioned those which can be dried, for example in a stream of hot air, in such a way as to form a non-sticky film on the sheet of the printed support, such as, for example, the nitrocelluloses. As binders which are particularly suitable, esters (acetates or acetobutyrates, for example) will be mentioned, and above all cellulose-ethers soluble in the organic solvents present in the inks used to form the colored layer such as hydroxypropyl-, propyl-, benzyl- and ethoxy-ethyl-celluloses as well as their mixtures, and more especially ethyl-cellulose and the mixtures of cellulose ethers containing ethyl- or hydroxypropyl-cellulose.

The supports obtained allow synthetic materials to be dyed or printed. This dyeing or printing which is also the subject of the present invention consists of placing the temporary support, printed as has just been described, at least locally in contact with the material to be dyed, which is preferably brought, during this placing in contact, to a temperature of the same order of magnitude as that at which the dyestuffs pass into the vapor state, in order that the latter do not simply condense on the surface. The dyeing or printing is thus reduced to pass over a hot plate or over a hot calender or on any other apparatus which allows the temporary support and the material to be dyed to be placed in contact, and to be brought to the required temperature for the necessary length of time.

No subsequent treatment, of washing or steaming, is necessary to fix the dyestuff or to avoid its subsequent discharge.

The present process is suitable for dyeing synthetic materials such as polyamides (polymers of ε-caprolactam or of hexamethylene-diamine adipate), polyesters, especially linear polyesters, such as polyethylene terephthalates, polyacrylonitriles and the like. The materials to be dyed can be in the most varied forms, for example in the form of sheets or films.

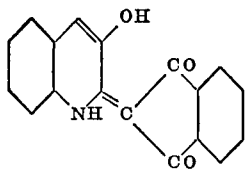
On materials of strong affinity such as polyamides or polyesters, the fastness to water, to washing and to rubbing is excellent and superior to that which is obtained on these materials with the same dyestuffs by conventional processes of dyeing or printing. The sharpness of the lines and the designs is noteworthy.

In the examples which follow, which do not imply a limitation, the parts and percentages indicated are expressed by weight, unless an indication to the contrary is given.

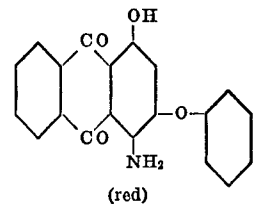
EXAMPLE 1

Printing of a multi-colored design on one face of a sheet of an ethylene terephthalate polymer: a strip of paper is coated with a thin layer of bone gelatin (about 2 grams per m.²) using one or more cylinders and a solution of 10 parts of gelatine in 100 parts of a mixture of 5 parts of ethyl alcohol and 100 parts of water, and is dried.

Yellow, red and blue inks are prepared by dispersing 6 parts of each of the dyestuffs

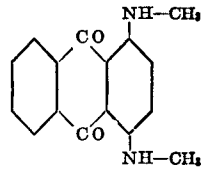


(yellow)



(red)

and



(blue)

with 6 parts of ethyl-cellulose in 88 parts of isopropyl or ethyl alcohol. The face of the paper coated with bone gelatine is printed, by photogravure printing, with these inks and several inking cylinders, in such a way as to obtain a multicolored design, and is dried.

A film or a web of ethylene terephthalate polymer is placed on the sheet of paper which has been printed in this way, and the whole is passed over a metal plate, heated electrically to 200° C. A second, unheated, plate ensures even contact. The time of contact whilst hot is 1 minute. A faithful reproduction of the design, of which the lines remain sharp, is thus obtained on the polymer.

In place of an ethylene terephthalate polymer film or web, it is possible to use a polyamide film, web or knitted ware (polyhexamethylene adipamide or ε-caprolactam polymer).

It is also possible to operate continuously by heating at a higher temperature and by controlling the speeds of the printed paper and the film to be colored, in such a way that they remain in contact, for example, for 25 seconds at 210° C.

The dyeing yield is thus considerably greater than that of the process in which a paper which does not carry gelatin is used.

EXAMPLE 2

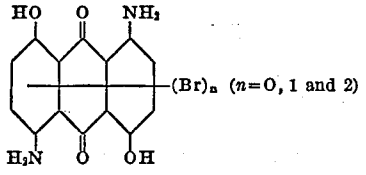
The procedure of Example 1 is followed, but on a single printing machine, the first cylinder of which coats the paper over its entire width with a solution of 12 parts of bone gelatine in 100 parts of water. After an intermediate drying, the paper passes over the other cylinders of the machine which print a multi-colored design using the yellow, red and blue inks indicated in Example 1.

The temporary support thus obtained also allows the printing of polyester or polyamide surfaces with a remarkable sharpness.

In place of gelatine, ovalbumin can also be used.

EXAMPLE 3

A green ink is prepared by dispersing, in 88 parts of isopropyl alcohol, 7 parts of a preparation containing 50% of ethylcellulose and 50% of a blue dyestuff consisting of a mixture of dyestuffs of the formula



and 5 parts of the preparation containing 50% of the yellow dyestuff 2-hydroxy-5-methyl-4'-acetylamino-azobenzene and 50% of ethylcellulose.

In the same way, an orange ink is prepared by dispersing respectively 6.5 and 6 parts of preparations containing 50% of ethylcellulose and 50% of the yellow dyestuff or the red dyestuff mentioned in Example 1 (respectively, 3-hydroxy-quinophthalone and 1-hydroxy-4-amino-3-phenoxy-anthraquinone), in 90 parts of isopropyl alcohol.

A uniform green print is produced on a temporary paper support by printing with a cylinder engraved with a helix usually employed in this technique. The support is dried. By using a photoengraved inking cylinder, a pattern, for example in the form of a flower, is then printed on this uniform green print, with a preparation containing

	Parts
Bone gelatine	5
Potassium dichromate	0.2
Water	95
Ethyl alcohol	5

The support is dried, and then a circle is printed with another inking cylinder in the centre of the flowers with orange ink. The support is dried.

The temporary support thus obtained allows a print of remarkable sharpness to be produced, by dry transfer in the vapor phase, on polyester, polyacrylonitrile or polyamide white surfaces, yielding white flowers with an orange heart on a green ground.

EXAMPLE 4

A uniform red print is produced on a paper support using the following ink:

	Parts
Preparation containing 50% of ethyl-cellulose and 50% of 1 - hydroxy-4-amino-3-phenoxy-anthraquinone	4
Ethylcellulose	4
Isopropyl alcohol	92

The support is dried, and then this print is uniformly coated with a colloidal layer based on:

	Parts
Dichromate-treated gelatine (8% by weight of potassium dichromate)	5
Water	92
Ethyl alcohol	8

The support is dried in a dark room, and is exposed to light across a transparency carrying the image to be produced. Stripping is carried out with a solution consisting of:

	Parts
Water	80
Ethyl alcohol	20

made luke-warm at 40° C., and the support is dried.

The temporary support prepared in this way carries a colloidal layer, recessed to a greater or lesser extent depending on the greater or lesser opaqueness of the original. By dry transfer in the vapor phase, it is possible to obtain the reproduction in red of this original on any polyester, polyamide or polyacrylonitrile surface.

An organic solvent other than isopropyl alcohol, for example, toluene, can also be used.

EXAMPLE 5

Using one of the inks described in the preceding examples, a uniform print is produced on a support consisting of a polyethylene terephthalate film, approximately 60μ thick, coated with a thin layer of bone gelatine according to the process described in Example 1 for a strip of paper.

The support prepared in this way allows a satisfactory dry transfer in the vapor phase onto any polyester, polyamide or polyacrylonitrile surface.

Likewise satisfactory results are obtained when a cellophane or a cellulose acetate film instead of a polyethylene-terephthalate film or a papersheet are covered with a thin layer of gelatine.

What is claimed is:

1. A strip, sheet or tape of flexible, heat-stable material, having one of the faces thereof completely or partially covered in any order with at least two thin layers of organic materials said layers being (a) a colored layer consisting essentially of (1) at least one dyestuff, at least one optical bluing agent or mixtures thereof which pass into the vapor state at between 160 and 220° C. at atmospheric pressure, and (2) a binder which is stable in the indicated temperature range and is soluble in the organic solvents present in the inks used to form the colored layer, and (b) a layer consisting of an albuminoid material which is stable to heat in the indicated temperature range, and which is capable of being sensitized to light when it is placed over a colored layer and which is preferably non-hardened when it is between the surface of the said flexible heat-stable material and a colored layer.

2. A support according to claim 1 wherein the layer (b) is between the surface of the flexible heat-stable material and the colored layer, is continuous and is a non-hardened albuminoid material.

3. A support according to claim 1 wherein the colored layer (a) is between the surface of the flexible heat-stable material and the layer of albuminoid material.

4. A support according to claim 1 wherein the colored layer (a) is located between two layers of albuminoid material, one of which is between the flexible heat-stable material and the colored layer and is continuous.

5. A support according to claim 1 wherein the layer or layers of albuminoid materials consist essentially of gelatine.

6. A support according to claim 3 wherein a layer of albuminoid material is printed over the colored layer and is applied in the form of a regular or irregular design or pattern to only one part of the surface of this colored layer.

7. A support according to claim 6 wherein the layer of albuminoid material printed on the colored layer in the form of a regular or irregular design or pattern is insoluble in cold or lukewarm water or in a mixture of water and an organic solvent.

8. A support according to claim 7 wherein the layer of albuminoid material printed on the colored layer in the form of a regular or irregular design or pattern consists essentially of gelatine which has been rendered insoluble either by the action of a chemical reagent or by the action of light in the presence of dichromate.

9. A support according to claim 1 wherein the colored layer, which is in direct contact with the flexible heat-stable material or isolated from this material by a layer of albuminoid material, is of a single color.

10. A support according to claim 1 wherein the colored layer, which is in direct contact with the flexible heat-stable material, or isolated from said material by a layer of albuminoid material, comprises a regular or irregular design or pattern in at least one color.

11. A support according to claim 1 wherein the colored layer or layers contains as a binder a cellulose ether or ester.

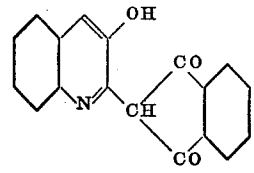
12. A support according to claim 1 wherein the dyestuff or dyestuffs and/or optical bluing agents contained in the colored layer or layers have sublimation or vaporization curves which are similar between 180 and 210° C. at atmospheric pressure.

13. A support according to claim 11 wherein the colored layer or layers comprise at least one anthraquinone dyestuff.

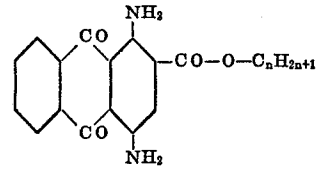
14. A support according to claim 11 wherein the colored layer or layers comprise at least one azo dyestuff.

15. A support according to claim 11 wherein the colored layer or layers comprise at least one quinophthalic dyestuff.

16. A support according to claim 11 wherein the colored layer or layers comprise at least one of the following dyestuffs: 1,4-dimethylamino-anthraquinone, mixtures of mono- and dibromo-1,5-diamino-4,8-dihydroxy-anthraquinone, mixtures of mono- and dichloro-1,5-diamino-4,8-dihydroxy-anthraquinone, 1-amino-4-hydroxy-2-phenoxy-anthraquinone, 4-(4'-methyl-2'-nitrophenylazo)-3-methyl-5-pyrazolone, 1-amino-2-cyano-4-anilidoanthraquinone, 1-amino-2-cyano-4-cyclohexylamino - anthraquinone or one of the derivatives of the formula



and



in which *n* is an integer equal to 3 or 4.

17. A support according to claim 1 wherein the colored layer or layers comprise ethyl or hydroxypropyl cellulose as a binder.

References Cited

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