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PROCESS FOR APPLYING COLORED DESIGNS ON FABRICS

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It has been proposed to print colored designs on a layer of a thermoplastic material, provided on a fabric, by the decalcomania method, i. e. by first applying the design by means of a transferable fatty printing ink on paper and by subsequently transferring the inked design from the paper to the fabric bearing the layer of synthetic material by pressing the same together, whereupon the paper is removed. Such a method is described, for example, in Swiss Patent 237,008. The thermoplastic layer may be produced on the fabric by treating the surface thereof with a solution of the thermoplastic material in an organic solvent or with a dispersion of said material in water, care being taken that the meshes of the fabric are entirely filled with the thermoplastic material and that there is a more or less uniform, continuous layer of the same on the fabric.

The present invention relates to a process for printing colored designs, more particularly multicolored designs, on a fabric by first printing the design on paper by means of a fatty printing ink and subsequently transferring the design to the fabric treated with a synthetic resin, which process, however, differs from the prior process referred to above in that the fabric is provided with so small a proportion of a synthetic resin that it would be insufficient to fill the meshes of the fabric. In this case a continuous layer of the synthetic resin is not produced but the individual threads of the fabric are coated with the resin, with the result that the fabric substantially retains its original structure and the character of the fabric is not lost, as in said prior process. Nevertheless the colored design adheres firmly to the fabric, owing to the thin coating of resin on the individual threads.

The proportion of synthetic resin applied to the fabric may vary, depending on the nature of the fabric, the synthetic resin used, etc. It should generally be not more than 20 g. per m.² of the fabric and in most cases very good results are obtained with 10 g. or less.

The invention is especially of importance for making reproductions of paintings. Owing to the fact that the surface of the fabric has substantially maintained its original structure, but has acquired a certain brilliancy from the synthetic material, with which the threads are coated, such reproductions make the impression of oil paintings. Thus it is possible in a very simple manner to make very attractive reproductions of paintings.

The printing of the colored design on paper is effected according to the well-known decalcomania methods and the production of these paper transfers does not form an object of the invention. The printing inks used generally are dispersions of coloring materials, generally pigments, in a fatty mass.

Synthetic resins that may be advantageously used are the polyvinyl and polyacrylic resins, but it is also possible to obtain satisfactory results with other synthetic resins, more particularly thermoplastic resins, provided that they swell with oil to a sufficient extent, so that the printing ink is bound by the layer of synthetic resin and penetrates therein.

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The process according to the invention is preferably carried out by means of a solution of the synthetic material in an organic solvent, but, if desired, aqueous emulsions of synthetic material may also be applied.

Various kinds of fabrics are suitable for the purpose of this invention. We may use for example an ordinary cotton cloth. When such a cotton cloth is treated with a solution or emulsion of the synthetic resin in the proportions indicated above it will appear that after drying the meshes of the fabric have remained open and that there is only a thin coating of synthetic resin on the individual threads, so that, apart from a certain brilliancy, the appearance of the fabric is not essentially different from that of the untreated fabric.

Satisfactory results may also be obtained when using a painter's canvas.

The ordinary painter's canvas is often treated with linseed oil so as to make it more suitable for receiving the paint layer. In such painter's canvas the meshes generally contain a thin, continuous film of dried linseed oil, so that they are not open. If this canvas is treated with a small proportion of a synthetic resin as specified above it will appear that in this case too the canvas has maintained its original appearance, owing to the fact that there is only a thin coating of the synthetic resin on the individual threads, but that in other respects the structure of the fabric has remained substantially the same. Such a canvas is also well suited for the present purpose.

The transfer of the design from the paper to the fabric is preferably effected at elevated temperatures and under a considerable pressure. Good results are obtained, for example, at temperatures ranging from 50–180° C. and pressures ranging from 3–10 atmospheres. In this case sharp prints are already obtained after a contact period of a few seconds. Dependent on the conditions during the treatment and on the nature of the paper and the synthetic material used a larger or smaller proportion of the colored layer will be transferred from the paper to the fabric. In some cases the paper can be used for two or more successive prints. Both freshly printed paper and older prints may be used. The print on the paper should, of course, be the mirror-image of the reproduction ultimately desired on the treated fabric.

The invention will be elucidated by the following example.

The fabric used for this example is an ordinary cotton having a weight of 290 g./m.². This canvas is tightly stretched and by means of a doctor blade it is very thinly coated with an aqueous dispersion of polyacrylonitrile. The amount of dispersion remaining on the fabric is so small that after the drying of the fabric the threads are coated with a thin layer of the resin, whereas the meshes of the fabric remain open. The fabric thus treated may contain, for example, 10 grams of resin per square meter. It is advantageous after the drying treatment to lightly rub the fabric on the side to be printed with a fat talcum in order to prevent the fabric from sticking to the transfer paper.

A transfer paper bearing a multicolored design which has been produced according to the well known technique e. g. a reproduction of a picture, is now pressed against the fabric and they are passed together through a heated calender. The heated cylinder of the calender has a temperature of from 120–140° C. and the fabric passes through the calender at a rate of 3 meters per minute.

The material coming from the calender is cooled and the paper is removed from the fabric. This is preferably effected in wet condition because this makes the removal of the paper much easier.

After the paper has been pulled off, the surface of the cotton fabric is cleaned, for example by washing with water. This removes inter alia, the slight amounts of size

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which in this technique are often used as an intermediate layer between the paper and the layer of fatty printing ink.

The fabric provided with the transferred image is now slowly dried, stretched, on frames and varnished.

I claim:

1. A method of providing colored designs on woven fabrics which comprises applying on said fabric a proportion of a synthetic resin which per se is insufficient to fill the meshes of said fabric and which coats individual threads to maintain its outward woven appearance, printing the design on paper by means of a transferable printing ink, transferring the design from the paper to the fabric according to the decalcomania method by pressing the same together and removing the paper.

2. A method of making a reproduction of a picture on a woven fabric which comprises applying to the fabric a proportion of a synthetic resin which per se is insufficient to fill the meshes of said fabric and which coats individual threads to maintain its outward woven appearance, making a reproduction of the picture on paper by means of a fatty printing ink, transferring the image from the paper to the fabric according to the decalcomania method by pressing the same together and removing the paper.

3. A method according to claim 1 in which the synthetic resin is applied to the fabric in the form of a solution of said resin in an organic solvent and the fabric so treated is subsequently dried.

4. A method according to claim 1 in which the synthetic resin applied to the fabric is polyacrylonitrile in the form of an aqueous dispersion of said resin and the fabric so treated is subsequently dried.

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5. A method according to claim 1 in which the synthetic resin is a polyvinyl resin.

6. A method according to claim 1 in which the synthetic resin is a polyacrylic resin.

7. A method according to claim 1 in which the proportion of synthetic resin used is about 10 grams per square meter of the fabric.

8. A method according to claim 1 in which the transfer of the design from the paper to the fabric is effected at a temperature of 50-180° C.

9. A method according to claim 1 in which the transfer of the design from the paper to the fabric is effected under a pressure of 3-10 atmospheres.

10. A method according to claim 1 in which the paper is wetted before being removed from the fabric.

11. A fabric the individual threads of which are coated with a synthetic resin in a proportion of not more than about 20 grams per square meter of the fabric, bearing a colored design in a transferable fatty printing ink.

12. A fabric according to claim 11 in which the proportion of synthetic resin is not more than about 10 grams per square meter.

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