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P. J. ARIENTE ET AL

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ORNAMENTED FABRIC AND METHOD OF ORNAMENTATION

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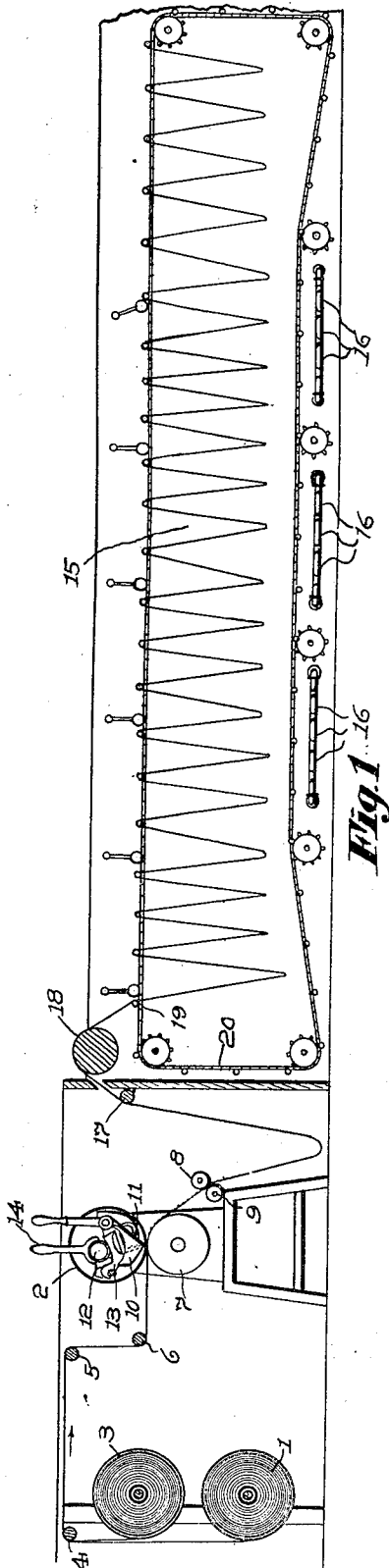


Fig. 1

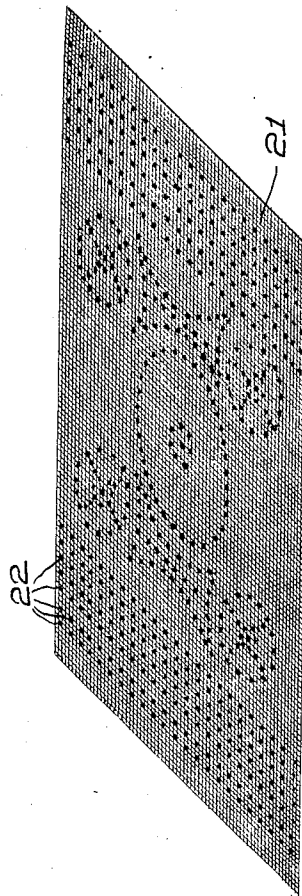


Fig. 2

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UNITED STATES PATENT OFFICE.

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ORNAMENTED FABRIC AND METHOD OF ORNAMENTATION.

Application filed June 29, 1923. Serial No. 648,553.

To all whom it may concern:

Be it known that we, PETER J. ARIENTE and LORENZ FLICK, citizens of the United States, residing at Saylesville, in the county of Providence and State of Rhode Island, and Providence, in the county of Providence and State of Rhode Island, respectively, have invented an Improvement in Ornamented Fabrics and Methods of Ornamentation, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to ornamented fabrics and the method of making the same.

Heretofore, it has been proposed to decorate or ornament fabrics, such as gauze, silk, and the like, by applying thereto drops or globules of materials which melt or soften under the action of heat or moisture, or both; for instance, such material as gum-arabic, either alone or mixed with pigments or coloring matter, have been utilized for decorating fabrics, but in such cases the drops or globules of ornamenting material have been thermoplastic and soluble, so that the drops or globules have not been stable or fixed, and when subjected to heat or moisture were liable to become detached or distorted, nor could the fabric so ornamented be employed satisfactorily for dress goods or laundered without substantial destruction of the ornamental effect.

In accordance with the present invention, the fabric is provided with insoluble permanent ornamentations containing the hard, non-thermoplastic condensation products of phenol and formaldehyde. Since these final products are hard and infusible, the ornamentations must be applied to the fabric before this final condition is reached or during some intermediate stage of the reactions which produce the final product. It is characteristic of such condensation products that at an intermediate stage of the chemical reactions, the products are fusible and plastic, but through the action of heat or heat and pressure or by the use of other condensing agents, they can be rendered hard, insoluble and non-thermoplastic. In accordance with the method of the present invention advantage is taken of these facts

by applying the condensation product to the fabric while the product is still liquid or plastic and then subjecting the ornamentations to a heat treatment or other agent which renders the ornamentations hard, insoluble, and non-thermoplastic and effects a permanent attachment of the ornamentations to the fabric. The result is that an ornamented fabric is produced in which the ornamentations are stable or fixed, and which may then be subjected to moisture and heat without injury to the ornamentations or liability of detachment, even though the ornamented fabric be subjected to a laundering operation.

In carrying into effect the method of the present invention, the ornamental portions of the liquid or plastic condensation may be applied to the fabric in any suitable way, either by hand or mechanical means, and such ornamental portions may be variously shaped or arranged in related positions to produce a pattern or design, or they may be applied as small drops or globules resembling beads, all of which details are subject to change and variation as desire may dictate. In some cases the condensation product may be modified, as by the addition of camphor gum, or by a pigment or coloring material and such variations of color effect may be utilized in the production of any desired ornamental pattern or design. In their final condition, however, the ornaments possess a high degree of physical inertness and technical properties so that the ornamented fabric may be laundered and even subjected to the action of boiling water without injury.

Since the phenol condensation product is applied to the fabric while in one of the intermediate stages of the chemical reaction which results in the final product, or while in a liquid or plastic condition, the fibres or the threads of the fabric become embedded more or less in the product or ornamentations, with the result, that when the ornamentations are treated by heat or other hardening agent in the production of the final product, they become firmly and permanently connected to the fabric and are not disturbed when the fabric is subjected to the heat and moisture of the laundering

operation. Fabrics ornamented as described, are consequently well adapted for dress goods and other purposes, and the high lustre and sparkling qualities which characterize the ornamentations remain fixed and unimpaired by use.

In the accompanying drawings:

Fig. 1 is a sectional side elevation of one form of machine which may be advantageously employed in carrying out the method of the present invention; and

Fig. 2 is a top perspective view of a fabric embodying the present invention and showing the ornamentations of a phenol condensation product arranged in pattern effect.

The fabric to be ornamented may be of any usual character and construction and when the phenol condensation product in liquid or plastic state is to be applied by mechanical means, the fabric may be fed from a suitable source of supply, as, for instance, the roll 1, and passed into cooperative relation with a stenciling cylinder 2, having surface perforations of any desired shape, for depositing the condensation product upon the fabric.

In the machine shown the fabric is laid upon a backing cloth or "back grey" which may be supplied conveniently from a roll 3 or other source of supply, and both are passed over guides 4, 5 and 6, to the point of application of the condensation product.

In the present instance, a cylinder 7 is mounted below the stenciling cylinder 2 and the back grey and fabric pass between the two and thence to the driven rolls 8 and 9. Within the stenciling cylinder is a condensation supply trough or receptacle 10 having an opening which may be controlled by a doctor or shutter 11 to regulate the amount of the product that shall be delivered through the stenciling cylinder to the fabric beneath as the latter is fed between the two cylinders. The trough or receptacle 10 may be supplied with the liquid or plastic condensation product from time to time through a reservoir, constituted, in the present instance, by a pipe 12 having a normally closed bottom opening 13 which may be uncovered by rotation of the pipe 12 through the medium of a handle 14.

From the construction thus far described it will be apparent that as the fabric and back grey pass between the stenciling cylinder 2 and the roller 7, deposits of phenol condensation product will be made upon the fabric, and that such deposits of the phenol condensation product will be shaped in accordance with the openings in the stenciling cylinder. The fabric and back grey then pass between the driven rollers 8 and 9 which may have appropriately formed selvage engaging portions which act only on the selvages of the back grey which may

be wider than the fabric itself, so that the still plastic or liquid deposits of the condensation product are not injured.

The back grey and fabric are then subjected to a heat treatment, in the present instance, which serves to convert the partially condensed product on the fabric into the final insoluble and non-thermoplastic product.

In the machine which is shown as one mechanical means of carrying out the method of the present invention, a heating chamber 15 is provided which may be heated by steam or other heating medium passed through pipes 16, and the fabric with the still liquid or plastic condensation products thereon and the back grey are then passed over a guide roller 17 and over a drawing roller 18 to be looped about bars 19 carried on the endless chain 20 which may be driven from any suitable source of power. The heating chamber 15 is of sufficient extent and sufficiently heated to effect a final chemical reaction to produce the final product which is hard, insoluble and non-thermoplastic. The construction of the heating chamber and the means for applying the phenol condensation product to the fabric do not constitute features of the present invention, and are shown as one form of practical means for carrying the method of the present invention into effect.

When the liquid or plastic phenol condensation product is deposited upon the fabric, it will embed in itself fibres or threads of the fabric, and consequently when the phenol condensation is subjected to its final treatment to harden and render it insoluble and non-thermoplastic, the deposits or ornamentations will be permanently secured to the fabric to such a degree, that they will be unaffected by subsequent exposure to moisture and heat, either or both, and the fabric itself may be laundered without disturbing the relation between the deposits or ornamentations and the fabric or altering the shape of the ornamentations themselves.

In Fig. 2 the fabric 21 is shown as of ordinary woven construction, but it may be of any character suitable for the intended purpose, such, for instance, as knitted, netted, felted or leather fabric, and the phenol condensation products are shown as small deposits 22 arranged in pattern form or design, it being understood that the shape of the ornamentations, or their size or extent and color may be varied indefinitely within the scope of the present invention.

A fabric ornamented by deposits of a phenol condensation product, such as described, is suitable for dress goods and a great variety of uses where ornamented fabrics are desired. Such a fabric may be subjected to heat and moisture and even be

laundered without injury to the hard, insoluble, and non-thermoplastic ornamentations, which are permanently secured to the fabric by the fibres or threads being embedded in the condensation product.

The term "non-thermoplastic" as applied to the ornaments of the fabric is herein employed to designate that the material of the ornaments is substantially infusible and does not soften or become plastic under conditions of use or when subjected to the heat and moisture of a laundering operation; and the term "insoluble" as herein employed means that the material of the ornamentations is unaffected by moisture incident to use or by the water during laundering. Any of the condensation products of phenol and formaldehyde which result in the final hard, insoluble, and infusible product can be used.

What is claimed is:

1. The method of ornamenting fabrics, which consists in placing deposits of a phenol condensation product on the fabric in spaced relation while in liquid or plastic condition, and then subjecting the deposits to the action of an agent which renders the deposits hard, insoluble and non-thermoplastic and permanently secures them to the fabric.

2. The method of ornamenting fabrics, which consists in placing on the fabric separated deposits of a phenol condensation product while in a liquid or plastic condition, and then subjecting the deposits to a heat treatment which renders them insoluble and non-thermoplastic and effects a permanent connection with the fabric.

3. The method of ornamenting fabrics, which consists in placing on the fabric in separated relation deposits of a phenol condensation product while in a liquid or plastic condition, maintaining the characteristic flexibility of the fabric substantially unimpaired, and then subjecting the fabric and deposits to a heat treatment which renders the deposits hard, insoluble, and non-thermoplastic and effects a permanent connection with the fabric.

4. The method of ornamenting fabrics, which consists in placing on different por-

tions of the fabric and in separated relation to not materially interfere with its pliability deposits of a phenol condensation product while in a liquid or plastic condition and embedding fibres of the fabric in the deposits, and then subjecting the fabric and deposits to a heat treatment which renders the deposits hard, insoluble, and non-thermoplastic and effects a permanent connection with the fabric that it may be subjected to heat and moisture without injury to the separated deposits.

5. As a new article of manufacture, a pliable fabric ornamented by separated hard deposits of a condensation product permanently secured to the fabric and unaffected by heat and moisture.

6. A new article of manufacture for dress goods characterized by a pliable fabric having separated deposits of a hard condensation product forming ornamentations unaffected by heat and moisture and in which portions of the fabric are permanently embedded.

7. As a new article of manufacture, an ornamented pliable fabric the ornamentations of which are permanently secured to the fabric at intervals and embody an insoluble, hard, non-thermoplastic condensation product of phenols and formaldehyde in which fibres of the fabric are permanently embedded.

8. As a new article of manufacture, a pliable fabric ornamented by spaced hard deposits of an indurated, insoluble, non-thermoplastic condensation product of phenols and formaldehyde permanently secured to the fabric by the condensation product.

9. As a new article of manufacture, an ornamented pliable fabric, having thereon spaced deposits of a hard, insoluble, non-thermoplastic condensation product in which fibres of the fabric are permanently embedded and capable of being laundered without injury to the ornamentations.

In testimony whereof, we have signed our names to this specification.

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