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PATTERNED FABRIC AND PROCESS FOR
PRODUCING SAME

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This invention relates to novel patterned fab-
rics having portions treated to render them
translucent or transparent and other portions
treated to render them opaque and to processes
of producing the same.

In accordance with the invention the strands
in portions of a fabric are printed and the strands
in other portions are parchementized, that is
stiffened and rendered translucent or trans-
parent, this operation being effected in a man-
ner such that the unprinted portions of the fab-
ric and the printed portions are stiffened to about
the same extent.

Various other features, objects and character-
istics of my invention will become apparent from
the following detailed description.

The invention resides in the novel fabric,
processes and features of the character herein-
after described and claimed.

It is well understood in the art that cotton and
artificial silk fabrics may be prepared for com-
mercial use by pattern printing thereon with a
suitable dye dissolved in a carrier comprising a
gum, the latter, during the printing operation,
forming a coating on those fabric strands in the
printed portions. After the fabric has thus been
printed, it is subjected as an entirety to a
parchmentizing action. Between the printed
portions, the parchementizing acid stiffens and
increases the transparency of the fabric strands
but, by reason of the shielding effect of the gum
coating, such acid does not cause any substantial
parchmentizing action on the fabric strands in
and throughout the printed portions. The gum
coating is subsequently washed out. It results,
therefore, that in the printed portions, the fab-
ric retains its original soft, flexible character
and the contrast is not good. For some pur-
poses, this is an undesirable characteristic.

In accordance with the present invention
there is produced a novel patterned fabric com-
prising transparent or translucent areas and
more or less opaque well contrasted areas, the
fabric being of about the same stiffness through-
out. In United States Patent No. 2,075,695 there
is described a process in which a pattern of a
cellulose-containing composition with an acid-
resisting pigment is printed on to a cotton or
other cellulose-containing material and then
passed through a transparentizing swelling
agent, preferably sulphuric acid, under proper
conditions to cause transparentizing and stiffen-
ing. The composition used for printing in that
patent is readily permeable to the transparentiz-
ing swelling agent and thereby the resulting pat-

terned fabric is of about the same stiffness in
the printed and unprinted portions since the sul-
phuric acid readily penetrates the pattern and
stiffens the fabric beneath the pattern.

In accordance with the present invention in
order to form the pattern we employ prior to the
transparentizing treatment a nitrogenous or-
ganic binder or plastic, such for example as pro-
tein-containing substances such as albumen,
casein, gelatine and the like or casein, albumen,
gelatine and the like hardened with formalde-
hyde, or resins such for example as formalde-
hyde-urea. We find that we can obtain similar
but greatly improved results to those obtained
and described in said United States Patent No.
2,075,695 by the use of such nitrogenous binders.
With this invention it is not necessary or de-
sirable that the printing mass be permeable to
the transparentizing agent, such as sulphuric
acid. These improved results are due to the
facts, as we have discovered, that such printing
masses or substances will themselves give to the
printed portions of the fabric the desired feature
of being roughly of about the same stiffness as
the transparentized or ground portions so that
the fabric will have stiffness throughout, and
that these printing substances which were
known to be either soluble in or broken down by
parchmentizing strong inorganic acids as for ex-
ample, sulphuric acid which we employ, will not
be substantially permeable to or attacked by
such acids within the short time required to
transparentize the unprinted or ground portions
of the fabric, and will thus protect the fabric
under the printed areas from being trans-
parentized and will also protect the pigments
contained in the printing substances while ef-
fecting a wash-proof fixation of the pigment on
the fabric, thereby producing in a washproof
pigment print effect an improved contrast and
demarcation between the transparentized
ground portions and the printed portions due
to the full natural opaqueness of the untrans-
parentized fabric in the printed places plus the
opaqueness of the pigmented printing sub-
stances.

The printing may be applied in one or the
other stages of treatment of the fabric. It may
be put on first and transparentizing produced,
or it may be put on in intermediate stages of
treatment with the transparentizing agent.

While the printing substances herein used are
substantially impermeable to the parchementiz-
ing acid during the parchementizing treatment
and thus will substantially protect any contained

5 pigment during the period of the transparentizing treatment, yet after the treatment with the acid of parchmmentizing strength and during the substantially longer period before the acid is
 10 completely washed out, there will remain a certain amount of dilute acid which by diffusion may attack the contained pigment, and therefore, it is important to use a pigment which will not dissolve to any considerable extent in the
 15 parchmmentizing agent so that there may be obtained the desired optical contrast between the nontransparent portion and the transparent portion of the design.

As above pointed out, the transparentizing agent used according to our invention is a strong inorganic acid such as sulphuric acid.

Various pigments may be employed in carrying out the invention. For example we may use titanium white, barium sulphate, smalt or cobalt-blue, lamp-black and the like.

The following are specific embodiments of the invention, but these examples are not to be considered as limitations of the invention except as indicated in the appended claims:

25 *Example 1.*—A mercerized, bleached cotton muslin fabric is printed in a pattern with a paste consisting of:

	Parts by weight
30 Gelatine-----	30
Water-----	130
Titanium white-----	40

After drying, the fabric is passed through a 2% formaldehyde solution to render the gelatine water-insoluble, squeezed out and dried at 100° C. It is then passed through a sulphuric acid bath of 54° Bé. at 11° C. for 8 seconds. It is then washed out and mercerized in the usual manner with caustic soda solution of about 30° Bé. under
 40 tension. Thereafter it is washed out, acidified and finished. The result is a pattern design of a substantially opaque material on a stiffened transparent background, the whole fabric including the patterned portions being of substantially
 45 uniform stiffness throughout.

Example 2.—A mercerized, bleached cotton muslin fabric is printed with a paste consisting of:

	Parts by weight
50 Kaurit solution (described below)-----	20
Water-----	5
8% starch solution-----	30
Mono basic ammonium phosphate-----	0.8
Titanium white-----	9

55 After printing, the material is dried at 60–70° C. It is then heated for about 6 minutes at approximately 145° C. to effect final condensation of the urea-formaldehyde. The material is then cooled and is then treated with sulphuric acid of 54° Bé. at 11° C. for 8 seconds. It is then washed out and mercerized in the usual manner with caustic soda solution of about 30° Bé. under tension. Thereafter it is washed out, acidified and finished. The
 60 result is similar to that of Example 1.

65 The "Kaurit" solution mentioned is prepared by dissolving 50 parts by weight of the urea-formaldehyde pre-condensate known as "Kaurit" (made by the German I. G.). The 8% starch solution is prepared by mechanical stirring and
 70 boiling of starch with water until dissolved.

The process may be employed in connection with all kinds of fabrics, weaves, and other surfaces consisting of natural or artificial cellulose

also has application to the parchmmentizing of linen, cotton and artificial silk fabrics.

The expression in the appended claims "said fabric being subjected to one or more mercerizing treatments at some time prior to its final finishing" means that the mercerizing treatment may take place before or after the transparentizing or both.

The expression "cellulose-containing" as used in the appended claims is intended to designate
 10 cellulose material capable of undergoing transparentizing by acid transparentizing agents, and including natural cotton, etc., and regenerated cellulose.

In the claim, where the expression "acid transparentized" is employed, it refers to material which has been parchmmentized by strong inorganic acids such as sulphuric acid. And likewise where the expression "acid parchmmentizing agent" is employed, it refers to strong inorganic acids
 20 such as sulphuric acid.

While the invention has been described with respect to certain particular preferred examples which give satisfactory results, it will be understood by those skilled in the art after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. Process for producing a patterned effect which comprises printing in a pattern, on a cellulose-containing fabric, an adherent composition
 35 containing a nitrogenous organic binder with a pigment incorporated therein, said composition when dried being substantially resistant and impermeable to an "acid parchmmentizing agent" for the time required by such agent to transparentize
 40 the cellulosic fibers in the unprinted portions of the fabric, drying said printed composition and transparentizing said cellulosic fibers of the unprinted portions by passing the printed fabric through an "acid parchmmentizing agent" so that
 45 cellulosic fibers in said unprinted portions of the fabric are transparentized while such fibers in the printed portions are unaffected by the said parchmmentizing agent, thereby producing a washproof pigment print effect wherein an improved contrast and demarcation is obtained between said
 50 transparentized portions and the non-transparentized printed portions, due to the full natural opaqueness of the untransparentized fabric therein plus the opaqueness of the pigmented printing
 55 composition, and the fabric is of about the same stiffness throughout.

2. Process for producing a patterned effect which comprises printing in a pattern, on a cellulose-containing fabric, an adherent composition
 60 comprising a protein-containing binder with a pigment incorporated therein, said composition when dried being substantially resistant and impermeable to an "acid parchmmentizing agent" for the time required by such agent to transparentize
 65 the cellulosic fibers in the unprinted portions of the fabric, drying said printed composition and transparentizing said cellulosic fibers of the unprinted portions by passing the printed fabric through an "acid parchmmentizing agent," said
 70 fabric being subjected to one or more mercerizing treatments at some time prior to its final finishing, so that the cellulosic fibers in said unprinted portions of the fabric are transparentized while

by the said parchmentizing agent, thereby producing a washproof pigment print effect wherein an improved contrast and demarcation is obtained between said transparentized portions and the non-transparentized printed portions, due to the full natural opaqueness of the untransparentized fabric therein plus the opaqueness of the pigmented printing composition, and the fabric is of about the same stiffness throughout.

10 3. A permanent patterned cellulose-containing fabric having acid-transparentized portions and non-transparentized printed portions, the latter having printed thereon an adherent composition containing a nitrogenous organic binder with a pigment incorporated therein, said composition being substantially resistant and impermeable to

an "acid parchmentizing agent" for the time required to transparentize the unprinted portions of the cellulosic fibers of the fabric by such agent, so that the printed portions of the cellulosic fibers are unaffected by said parchmentizing agent, so as to provide a washproof pigment print effect wherein an improved contrast and demarcation is obtained between said transparentized portions and the non-transparentized printed portions due to the full natural opaqueness of the untransparentized fabric therein plus the opaqueness of the pigmented printing composition, and the fabric is of about the same stiffness throughout.

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