UNITED STATES PATENT OFFICE.

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TRANSPARENT PAPER AND PROCESS OF MAKING THE SAME.

1,302,100. Specification of Letters Patent. Patented Apr. 29, 1919.

No Drawing. Application filed March 1, 1915. Serial No. 11,219.

To all whom it may concern:

Be it known that I, WILLARD E. SWIFT, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Transparent Paper and Processes of Making the Same, of which the following is a specification.

The present invention relates to processes of treating paper to render the same transparent and, in general, has reference to the treatment of paper with oleaginous substances such as varnish, liquids having transparent matter in solution, or the like, to accomplish the desired result.

As heretofore practised, processes of this class, contemplating the application of a transparentizing substance in liquid form to opaque, or semi-opaque, grades of paper, have attained the desired effect by reason of the permeation of the fibers of the paper by such liquid, the degree of transparency attained being measured by the completeness of such permeation or absorption, which is oftentimes assisted by the subjection of the coated surface to the action of a fluid, such as air, under pressure. The adaptability of most commercial grades of paper to such treatment, by reason of the loosely-knit, coarse-fibered composition of the material and the villous, nap-like character of the surface thereof, is well recognized; it is apparent also that the best results in such processes are secured by the use of liquids having the property of drying very slowly, in order that the resistance of the material to permeation, which varies, of course, in different grades of paper, may be overcome, and also in order that sufficient time for the complete saturation of the paper by liquid may be afforded.

In such prior processes, the liquid passes completely through the paper, from one surface to the other; the action is essentially one of permeation, and as a consequence, the greater portion of the liquid is completely removed and isolated from the drying action of the atmosphere, the evaporation of the liquid is practically never completed, and the paper thus treated, while possessing a certain limited degree of transparency, invariably is of an oily or sticky nature on both sides, never thoroughly dry, and inherently unsuited to any use which involves the application of adhesive or glue thereto, for the purpose of attaching the same to various articles.

The process of the present invention is applicable only to certain grades of paper, already possessing a considerable degree of transparency, and in particular to that grade of transparent or semitransparent paper which is generally used by envelop makers in the manufacture of the so called "Outlook envelops" or envelops having a transparent panel to disclose an address on the inclosure, and which is commercially known as "glacine" paper; and the said invention, in contradistinction to the already known processes above referred to, is more perfectly carried out by the use of liquids which have the property of drying very quickly.

As is well known, "glacine" paper differs widely in composition and texture from ordinary opaque or semi-opaque paper; the texture of "glacine" paper is close-knit, by reason of the preponderance of cellulose matter in the composition thereof, and, moreover, said paper presents a smooth, hard and practically impenetrable surface, quite unlike the nap-like surface of ordinary paper. The cellulose character of the material gives it its transparency quality; however, I have discovered that the degree of such transparency may be very considerably increased by the treatment of one or both surfaces with a liquid, such as a varnish, or other substantially transparent liquid having resinous or other transparent matter in solution.

In carrying out my invention, such a liquid is applied by any suitable means, in a thin coating over one or both surfaces of the "glacine" paper. Such application may be made with a brush, or by the use of a die or roller coated with the liquid or by any other well-known means. Preferably, a solution having the property of drying quickly is used; but I do not wish to confine myself to the use of such a solution, since it is manifest that the character of the paper itself, by reason of its impenetrability, is conducive to the rapid drying of the liquid, since said liquid lies on the surface of the paper in a thin film, completely exposed to the evaporative action of the air.

It is found that the transparency of the

paper is greatly increased by such treatment; in addition to the advantages derived by a rapid drying of the treated paper, owing to the complete exposure of the liquid to the air, it is found that such drying is most complete and thorough, there being no penetration of the body of the paper by the liquid, and hence no liquid residue tending to render the paper sticky or oily to the touch. Moreover, notwithstanding the thinness of the paper, the treatment of one surface of the same, in the manner above described, has absolutely no effect upon the reverse surface; so that, while increasing the transparency of the paper in marked degree, such treatment of one surface leaves the paper suitable for the application of glue or adhesive to the other surface, for the purpose of attaching the same to various articles.

I am aware that it has been proposed heretofore to treat various grades of opaque paper with an oleaginous substance in order to render the same transparent, and I make no claim to such a process or operation. In such prior processes the desired result is obtained wholly by the absorption of the liquid by the fibers of the paper, the latter being readily susceptible to rapid and complete permeation. My process is concerned with the treatment of paper of a particular variety, the characteristic feature of which is its nonfibrous structure, and its ability to resist permeation by any liquid; to promote this action as above described, I preferably employ a liquid which is quick drying, in order to avoid any possibility of permeation, which action would destroy the efficacy of my process.

I claim,

1. A transparent paper formed by applying rapidly drying transparent liquid having resinous matter in solution to the surface of a semitransparent nonabsorbent paper having a hard smooth surface.

2. The herein described process of treating a semitransparent nonabsorbent paper having a hard smooth surface by the application thereto of a rapidly drying transparent liquid having resinous matter in solution.

Dated this 25th day of February 1915.

WILLARD E. SWIFT.

Witnesses:

PENELOPE COMBERBACH,

NELLIE WHALEN.