UNITED STATES PATENT OFFICE.

JOHN BRODRICK, OF NEW YORK, N. Y.

MANUFACTURE OF STENCIL-SHEETS.

SPECIFICATION forming part of Letters Patent No. 525,675, dated September 4, 1894.

Application filed December 2, 1887. Serial No. 256,837. (No model.)

To all whom it may concern:

Be it known that I, JOHN BRODRICK, of the city, county, and State of New York, have invented certain new and useful Improvements in the Manufacture or Preparation of Stencil-Sheets or Transmitting Printing-Sheets, of which the following is a description in such full, clear, and exact terms as will enable any one skilled in the art to which my invention relates to make and use the same.

The points of novelty of my present invention will be designated in the claims concluding this specification.

My present invention, broadly stated, consists among other things, of an art or process the essential steps of which are, first, coating or impregnating a sheet of open or veil-like material through which ink is readily transmitted, such as Japanese dental paper or yoshino, with a substance impervious to ink, such as paraffine; and second, then removing by any suitable means, said coating or filling therefrom, at the points or lines of printing without destroying or disturbing the texture or substance of the sheet. The aforesaid sheet should be of a structure so open that in the simple removal of the coating or filling at any point, the sheet becomes open to the transmission of ink thereat, so that by removing the filling or coating in the form or shape of any letter, figure, design, &c., the sheet becomes open to the transmission of ink in the form of such letter, figure, design, &c., and thereby constituting a transmitting printing sheet or stencil. In the practice of my invention I therefore employ a thin open or veil-like sheet of material coated or impregnated with a gummy or waxy substance, or other material, impervious to ink, said sheet being of such openness that when the coating or filling is removed by any suitable and efficient means at the points or lines of printing, the sheet at such point and lines permits the free passage of ink through the holes or interstices between the fibers of the sheet. Such a sheet dispenses with the necessity of employing in the preparation of a stencil a puncturing or abrading instrument, bearing surface or plate, or the use of alkali, acid or other decomposing agent. I use now one of the most open and thinnest grades of paper made of the Japanese tree or "*Morus pepyrifera sativa*," commonly known as yoshino in Japan, or as dental paper here, having by preference a weight of about seventeen ounces to the ream of sheets, fifteen inches by ten and one-half. As far as I am aware this is the only kind of paper now in the market, or known to the public, which is of sufficient openness, thinness and toughness to fulfill all the necessary conditions of the above described stencil sheet, and this paper has never before been waxed or gummed or used for stencils. But it will, of course be understood that any other sheet of material of the requisite openness, thinness and toughness, will be the equivalent, and may be employed in place of the above described sheet. This sheet of extremely open paper is coated or filled with any suitable substance impervious to ink. The nature and quality of the material so employed will depend, to a great extent upon the means to be employed in removing it from the sheet at the lines or points of printing. I now prefer to employ wax or paraffine, as the coating material, either alone or combined with, or mixed with some other material. When the stencil is made by pressure, as in a type-writer or by a stylus, I prefer to employ a comparatively soft malleable material adhesive to a backing under pressure as soft paraffine of, say, 120° Fahrenheit fusion point. These sheets may be coated with paraffine or wax or other suitable material in any way now known to the art. As the method of applying such material to the paper does not constitute a part of my present invention I do not deem it necessary to describe it in detail here.

Any suitable and efficient means may be employed to remove from the sheet the said filling or coating material. I prefer, however, to remove said coating or filling by means of pressure alone, without materially destroying or disturbing the texture or substance of the sheet. If a stylus be employed in the ordinary manner, the paraffine or wax will be removed from the sheet, while the stylus passes over its surface with the ease and fluency almost of a lead pencil, producing an almost perfect representation of the writer's autograph with a pen.

The stencil plate for the production and multiplication of impressions of printing is, in case of the waxed sheet, made by impressing the type-letters or other desired characters, designs, pictures, maps, or illustrations upon the prepared sheet with type (as in a type-writing machine) or plates on which the letters, characters, designs, maps, pictures, illustrations or engravings are made of raised lines and surfaces, such as on being so impressed will express from the prepared sheet the said gummy or waxy substance, leaving the fibers thereof exposed and the interstices or holes between the fibers open for the transmission of ink. When the filling is not adhesive, as wax to some extent is under pressure the process, broadly considered, may still be substantially the same. Stencil plates thus prepared may then be used in duplicating impressions as aforesaid, or otherwise. This use of the prepared sheet further demonstrates the distinction between it and former prepared sheets, inasmuch as the impression of the type or other character or former prepared sheets would not produce a stencil, unless some perforating or abrading type, or perforating or abrading surface or chemicals were used.

While, as above set forth, I prefer to remove the coating from the paper by any suitable writing or printing instrument by means of pressure alone, which displaces the coating or filling at all points impressed by said instrument, thus leaving the interstices betwen the fibers of the sheet free and open for the transmission of ink, I employ other means, such, for instance, as a heated implement by means of which the material is melted or softened and is displaced under the action and through the agency of said instrument, and the fibers of the paper thus bared and the spaces between them left open for the transmission of ink. When such heated implement is employed the coating of the extremely open paper should consist of some material which can readily be softened or melted under the influence of the heated instrument. Paraffine or wax answer this purpose very well, and sheets coated or impregnated therewith may obviously be employed and transformed into printing or stencil sheets by either of the methods described.

As I have, however, obtained a patent, No. 505,698, dated September 26, 1893, for the method described of removing coating from this prepared sheet of paper by means of a heated instrument, as distinguished from pressure alone, I do not herein specifically claim such process or method, although it is included in the broader claims.

The stencil prepared substantially as above described may be used in duplicating impressions in a manner already familiar in the art of placing it on a piece of paper and passing an ink roller over it, or in any other manner described.

It will, of course, be understood, that during the operation of removing from the sheet the coating or filling, as above described, the sheet should preferably be held in some suitable support or laid upon some suitable backing. The backing I prefer to employ is an ordinary sheet of paper, of either sized or unsized paper or pasteboard having a smooth surface or an open material, for instance an uncoated sheet of yoshino paper. If the filling be of paraffine, which under the influence of the stylus or type is removed from the surface or expressed from the interstices of said sheet, more or less will be transferred, and adhere to the backing sheet, and will remain on the backing when the stencil sheet is removed therefrom. If, however, such a material as highly glazed pasteboard be used as backing, less of the paraffine will adhere to the underlying sheet.

To avoid possible misconstruction, I desire to say that when I specify in the claims that the ink-proof coating is to be removed without perforating the sheet I mean that the operation of making the stencil is not dependent upon perforations or ink passages then made, as in the sand-paper process, &c., but upon removing the coating and exposing the openings already existing in the sheet. In practice fibers here and there are broken when the sheet is made up of isolated and delicate fibers as in yoshino; but this action is not relied on to make the stencil, nor does it improve it. Indeed, it is an injury, as every fiber broken unnecessarily weakens the stencil by just so much. If the first passage of the inking roller does not bring the ink through at all points of the lines or characters described a few more passages in the ordinary manner will do so.

I do not herein claim the aforesaid stencil or transmitting printing sheet, as an article of manufacture as it forms the subject-matter of a patent granted to me February 7, 1888, No. 377,706, of which this application is a division.

I claim and desire to secure by Letters Patent—

1. The process or art of making stencils or transmitting printing sheets which consists in coating or impregnating a sheet of open or veil-like material through which ink is readily transmitted, as Japanese dental paper or yoshino, with a substance impervious to ink, as paraffine, and then removing said coating or filling therefrom at the points or lines of printing, without perforating the sheet.

2. The process or art of making stencils or transmitting printing sheets, which consists in coating or impregnating a sheet of open or veil-like material through which ink is readily transmitted, as Japanese dental paper or yoshino, with an adhesive substance impervious to ink, as soft paraffine; then placing said sheet upon a bearing surface to which said substance will adhere under pressure; removing said substance from the holes in said sheet, without perforating it by pressure

with a writing or imprinting implement; and then separating said sheet from said bearing surface.

3. The process or art of duplicating type-written matter, which consists in coating or impregnating a sheet of open material through which ink is readily transmitted, as Japanese dental paper or yoshino, with an adhesive substance impervious to ink, as soft paraffine; then placing said sheet upon a bearing surface to which said substance will adhere under pressure; then removing said substance from the holes in the sheet, without perforating it, by pressure of the types in a type-writing machine and then separating said sheet from said bearing surface.

JOHN BRODRICK.

Witnesses:
J. EDGAR BULL,
LEWIS H. NASH.