

UNITED STATES PATENT OFFICE

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STENCIL SHEET

No Drawing.

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My invention relates to improvements in stencil sheets for use in duplicating manuscript and typewritten documents, drawings and the like, consisting of a sheet of fibrous material having a coating which is impermeable to ink and being adapted to be stencilized by the pressure of a hand stylus or by the impact of the type of a writing machine.

Heretofore, such stencil sheets have been commonly formed in a sheet comprising a thin sheet of paper and a coating of waxy material, adhering to the support. The waxy materials now used for stencil purpose are almost wholly composed of paraffin, which is usually compounded with other mineral and vegetable waxes, such as ceresin wax, montan wax, carnauba wax, japan wax, and a shortening material, such as tallow, lard and other fatty oils.

The waxy stencil sheet, however, is fragile and liable to injury by wrinkling or bending. Consequently, the ink penetrates the paper along the lines of breakage, thus producing inferior or useless results. The main object of the present invention is to increase the durability and efficiency of the wax stencil sheet in an inexpensive manner.

The stencil sheet according to the present invention comprises a thin sheet of paper, such as Japanese thin tissue paper, or yoshino paper, coated with a molten waxy coating material prepared by combining paraffin, or other mineral waxes, together with a substance produced by esterification of polyhydric alcohols with bleached montan wax, or montanic acids.

Montan wax is obtained from lignite, the organic matter present in soft coal, by extraction with petroleum spirit. The crude extract is refined by steam distillation in vacuo, or by treatment with oxidizing agents, such as chlorine or chromic acid, in the presence of sulphuric or nitric acid.

The refined product is white or pale yellow in color, and has a fibrous structure. It consists chiefly of free fatty acids of high molecular weight e. g. montanic acids, associated with unsaturated hydrocarbons. The bleached montan wax, or oxidation products, are esterified alone or in admixture with

water or high-boiling solvents, such as naphthalene, which are subsequently removed, with polyhydric alcohols, such, for example, as ethylene glycol or glycerin.

The esterification may take place simultaneously with the production of a waxy substance of desired hardness. Accelerators, such as anhydrous zinc chloride or hydrochloric acid, may be used. The waxy product is a stiff and hard substance of smooth fracture, having a high melting point. The product is also very stable and free from impurities, as compared with natural waxes, and is miscible with paraffin, or other mineral waxes.

The coating of the stencil sheet according to the present invention, comprising mainly mineral waxes and the esterified montan wax montanic acids, is tough and strong, and does not crack in handling. It is durable for a long period of time and there may be produced thereon a clear writing by the pressure of an ordinary hand writing stylus, or by the impact of the type of a writing machine.

In the carrying out of the invention the proportions of the ingredients may vary according to several circumstances. As an example of a suitable composition, the following may be given:—

30 parts of an esterified montan wax, such as ethylene glycol ester, is added to 70 parts of paraffin wax having a melting point 135° F., and the mixture is melted together on applying heat and, when the mixture is suitably melted, the paper base, such as Japanese strong tissue paper, is coated with it in well known manner. Also, if desired, a quantity of other hardening or softening materials, such as fatty oils, fats, waxes and resins, may be added to the above coating composition.

What I claim is:—

1. A stencil sheet adapted to be stencilized by pressure, comprising a base of thin tissue paper coated with a mixture of mineral waxes and an esterification product of bleached montan wax and polyhydric alcohols.

2. A stencil sheet adapted to be stencilized by pressure, comprising a base of thin tissue

paper coated with a mixture of paraffin and an esterification product of bleached montan wax and polyhydric alcohols.

3. A stencil sheet adapted to be stenciled
5 by pressure, comprising a base of thin tissue paper coated with a mixture of paraffin and an esterification product of bleached montan wax and ethylene glycol.

4. The method of producing a stencil sheet
10 comprising applying a molten mixture of mineral waxes and an esterification product of bleached montan wax and polyhydric alcohols to a base of thin tissue paper.

5. The method of producing a stencil sheet
15 comprising applying a molten mixture of paraffin and an esterification product of bleached montan wax and polyhydric alcohols to a base of thin tissue paper.

6. The method of producing a stencil sheet
20 comprising applying a molten mixture of paraffin and an esterification product of bleached montan wax and ethylene glycol to a base of thin tissue paper.

In testimony whereof I affix my signature.

SHINJIRO HORII.

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