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## MANUFACTURE OF STENCIL SHEETS

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## 1 Claim. (Cl. 41—38.6)

My invention relates to improvements in the manufacture of stencil sheets as used for duplicating and kindred purposes and more especially of stencil sheets made of porous tissue paper, known as Janpanese-paper, which is coated with a thin film impervious to ink and usually composed of a mixture containing a protein, such as gelatine, and oily softening agents.

As a matter of fact known to practitioners, in the manufacture of stencil sheets which are coated with a mixture of this kind a serious mishap often occurs in as much as the mixture because of not being sufficiently stable and prematurely losing its homogeneousness cannot be evenly and uniformly spread out on the tissue paper during the manufacture of the stencil sheets and before the paper sheets are fully impregnated, the oily substances within the composition separating and floating on the remaining ingredients and porous spots appearing in the stencil sheets after drying.

One has attempted to eliminate these drawbacks by adding to the mixture, from which the composition is made, substances known to promote and enhance the emulsification, such as Turkey red-oil, sulfonated sperm-oil, or the like, but as far as the present inventor has learned with little success.

Another drawback inherent in stencil sheets coated with a mixture or an emulsion containing the said substances lies in the fact that the oily ingredients used as softening agents tend to become rancid, with the result that the film on the stencil sheets, if the latter remain unsold and unused for long periods of time, gradually loses its proper cohesion and ultimately completely decays.

The principal object of this invention is to overcome the said drawbacks by an improved coating composition for coating stencil paper sheets, which is safe against prematurely losing its homogeneousness and becoming prematurely decomposed.

The present invention aims at producing improved stencil sheets, the film coat of which is free from pores and will dry and solidify in a substantially shorter time than known heretofore.

The nature and scope of this invention are briefly defined in the appended claim and will be more fully understood from the following description:

I have now found that improved coating compositions may be obtained by first preparing an

aqueous solution of a protein such as gelatin, separately preparing an oily mixture of an oily emulsifying agent such as Turkey red oil and an oily non-hygroscopic softening agent which is a high molecular aliphatic mono-alcohol of the class consisting of fatty and waxy alcohols, mixing together the said aqueous solution and said oily mixture with agitation and warming and then dispersing the mixture so obtained in a volatile liquid; the volatile liquid being an aqueous alcohol solution. In this way I obtain improved coating compositions for the said purpose. The improved coating compositions so obtained are uniform and stable and yield coatings upon stencil-paper which rapidly dry and solidify, producing coated sheets, the coating of which is likewise uniform and stable.

In my new coating compositions the softening agent is oily and substantially non-hygroscopic, those properties being inherent in the high molecular aliphatic monohydric alcohols here employed. Oleic alcohol is typical and illustrative of the particular softening agent here employed, is a monohydric aliphatic alcohol of high molecular weight and is oily in character. As this alcohol is the alcohol which, so to speak, corresponds to oleic acid, it is sometimes called a fatty alcohol. On the other hand, as it is one of the monohydric alcohols obtained from the saponification of sperm oil (an oil which is really a liquid wax composed of the mono-esters of mono-basic fatty acids and the corresponding monohydric alcohol) oleic alcohol is one of the so called wax alcohols. As is known all of the monohydric alcohols obtained from wax, either liquid or solid, are aliphatic alcohols of high molecular weight.

As stated ante Turkey red oil is typical of the emulsifying agents here used; it being itself oily, its use is advantageous in admixture with the oily softening here employed.

Likewise I have found that good results can be obtained by using other oily non-hygroscopic softening agents in conjunction with the said oily monohydric alcohols; the additional oily softening agent or agents being used as a secondary softening agent to advantageously modify the said monohydric alcohol. For instance, primarily chlorinated naphthalene may be so used. Likewise the mono-oleate of glycerol or a glycol may be similarly used with equally good results; those esters being typical of the oily esters of the high molecular fatty acids with polybasic aliphatic alcohols; said esters con-

taining at least one free hydroxyl group in addition to the ester group.

By using the last mentioned substances as admixtures the tendency of the said softening substances to decompose and change their consistency on the stencil sheets while lying unused in stock, viz. as the result of the changes of temperature and humidity in summer and winter, is completely compensated.

I attribute the favorable effect of the substances proposed to be used according to this invention for making the improved coating composition—viz. for preventing premature decomposition of the emulsified product and retaining its homogeneousness before and during the impregnation of the stencil paper sheets—to the absence of softening agents which are soluble in water, such as glycerine,—further to the extremely fine dispersion of the softening agents in the water-alcohol mixture and to the uniform coagulation of the protein effected by a volatile dispersing agent.

In the present compositions the oily softening agents, etc., are advantageously correlated with the volatile liquid employed as the dispersion medium; the aqueous alcohol employed as the volatile liquid having the various effects stated. The greasy or waxy materials of high molecular weight here employed when in alcoholic solution or dispersion are very stable and highly resistant against chemical changes so that the drawbacks inherent in the heretofore known stencil sheets, such as the defects resulting from rancidity and the like in the coating compositions with which they were impregnated are completely eliminated.

Stencil sheets impregnated with an improved coating composition according to this invention will rapidly dry and then present a clean film coat which is free from pores and highly resistant against deteriorating attacks; in stencil sheets of this improved quality by writing, typing, or drawing thereon the film is easily perforated and cut at the perforated places, and stencils of great clearness are obtained.

Accordingly clear copies made on duplicating machines and showing well defined letters and other characters are obtained from said stencils, even if they are subjected to strenuous working and other adverse conditions.

Moreover corroding attacks upon those parts of typewriting and other machines with which the stencil sheets come into contact, and which here-

tofore were caused by water absorbing constituents of the film on the stencil sheets, are completely eliminated.

In preparing the improved composition I prefer to use the ingredients in about the following proportions:

#### Example 1

45 grams of gelatine are soaked and dissolved in 200 grams of water. 150 grams of Turkey red oil (as obtainable in the trade) are well mixed with 80 grams of oleic alcohol, and 30 grams of chlorinated naphthalene. The mixture is heated to about 60° centigrade and is added while being constantly stirred to the solution containing the protein.

To this mixture of protein and softening agents 400 grams of alcohol, in which one gram of dye stuff is dissolved and which are heated to about 30–40° centigrade, are added and thoroughly mixed therewith. The composition thus obtained, the solid ingredients of which are in extremely fine dispersion, is spread out upon the tissue paper sheets in the usual manner, and is then left to dry and solidify.

#### Example 2

45 grams of gelatine are dissolved in 200 grams of water and while the solution is heated to about 50–60° centigrade, there is added first a dispersion containing 150 grams of Turkey red oil, 50 grams of oleic alcohol, 25 grams of chlorinated naphthalene and 50 grams of glycerol-monoleate; thereafter there is added 1 gram of dissolved dye stuff under constant agitation.

Various changes and modifications may be made in the preparation of the improved coating composition for coating tissue paper sheets for the purpose described, without departure from the spirit and the salient ideas of the invention; and I wish my claim to be understood as not being restricted to the exact proportions of the various substances quoted in the above examples.

What I claim is:

A coating composition useful in coating stencil-sheets and the like, said composition comprising gelatin admixed with Turkey red oil, oleic alcohol, chlorinated naphthalene and the mono-oleate of glycerol, all the said materials being uniformly dispersed in aqueous alcohol.

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