

# UNITED STATES PATENT OFFICE

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## STENCIL SHEET FOR USE IN DUPLICATING

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This invention relates to stencil sheets for use in duplicating.

In the production of stencil sheets for use in duplicating, compositions containing oleaginous materials are commonly used in forming the ink-resisting medium of the stencil or, in other words, the coating composition which is supported by the highly porous material such as yoshino paper.

The majority of stencil sheets are employed in the production of stencils with the aid of a typewriter and as is well known the platen of the typewriter is formed of rubber as also are the feed rollers associated with the platen.

Oleaginous materials generally, for instance mineral oils, and the majority of fatty oils cause bodies of rubber to swell irregularly and inconveniences have arisen owing to the oleaginous materials included in such compositions detrimentally affecting the rubber portions of the typewriter with which they come into contact.

It would appear that castor oil exerts no or little detrimental action upon rubber and consequently the use of this oil in the production of stencil sheets would appear desirable.

With certain of the coating compositions which are at present in use, notably with the gelatine-oil compositions employed in the production of stencil sheets of the character which do not need moistening prior to cutting the stencil and which do not rely for their sensitivity upon their content of moisture, it is found difficult, if not impossible, to use castor oil as the sole or main tempering or softening agent for the gelatinizing organic colloid.

With regard to stencil sheets of this character it may be stated that the coating composition thereof consists of a gel in which is dispersed a non-hygroscopic and substantially non-water-retaining material acting as the sole or main tempering or softening agent for the gel and functioning to enable the structure of the composition to be broken down by the blows of the elevated portions of the type faces of a typewriter or by the pressure applied by means of a style without the areas enclosed by the incisions thus formed becoming

detached from the remainder of the stencil sheet, such stencil sheets being commonly known as "dry" or "permanent" stencil sheets.

The present invention is based upon the observation that the higher hydroxy fatty acid esters of alcohols which contain one or, at most, two hydroxy fatty acid radicles to each alcohol radicle in the ester molecule do not exhibit an undesirable action on rubber and that such esters are otherwise suitable in the production of stencil sheets of the character above indicated.

The present invention is based more particularly upon the observation that the esters of the higher hydroxy fatty acids and particularly the ricinoleic acid or poly-ricinoleic acid esters of the mono- or di-hydroxy alcohols or mixtures thereof are suitable for use in the production of stencil sheets of the character above indicated.

The invention therefore consists broadly in stencil sheets the coating compositions of which include a gelatinizing organic colloid and a higher hydroxy fatty acid ester of an alcohol, containing one or, at most, two hydroxy fatty acid radicles to each alcohol radicle in the ester molecule.

The invention more particularly consists in stencil sheets the coating compositions of which include a gelatinizing organic colloid and a higher hydroxy fatty acid ester of a mono- or di-hydric alcohol.

Thus, in accordance with the invention, a stencil sheet may comprise a coating composition including a gelatinizing organic colloid dispersable in water in association with a higher hydroxy fatty acid ester of a mono- or di-hydric alcohol and optionally with an emulsifying agent.

The hydroxy fatty acid esters of the glycols may conveniently be used in accordance with the invention; for instance the ricinoleic acid ester of ethylene glycol or trimethylene glycol may be employed.

As an example of an ester of a mono-hydric alcohol the ricinoleic acid ester of ethyl alcohol may be mentioned.

The following particulars are given by way

of illustration of suitable manners of carrying the invention into effect:—

*Example 1*

5 A composition including the following ingredients in the proportions stated:

	Parts by weight
Sulphonated sperm oil.....	33
10 Trimethylene glycol ricinoleate.....	66
Distilled water.....	50
Titanium pigment.....	15
Bentonite or wilkinité.....	3

15 is prepared and is added to a dispersion of 14 parts by weight of gelatine in 200 to 300 parts by weight of distilled water with which it is thoroughly mixed. Sheets of yoshino paper are coated with this mixture in known manner and after the gelatinous composition  
20 has set the coated sheets are subjected to the action of formaldehyde vapour.

*Example 2*

25 A composition including the following ingredients in the proportions stated:—

	Parts by weight
Sulphonated sperm oil.....	40
30 Trimethylene glycol ricinoleate.....	66
Distilled water.....	50
Titanium pigment.....	15
Bentonite or wilkinité.....	3

35 is prepared and is added to a dispersion of 11 parts by weight of gelatine in 200 to 300 parts by weight of distilled water. With this composition sheets of yoshino paper are coated and impregnated and treated with formaldehyde in known manner.

40 As will be understood, a very large number of bodies fall within the scope of the broad definitions of the invention which are given above and it has not yet been possible to prepare or obtain bodies fully representative of this class.

45 It is essential that the softening material or tempering agent in the coating compositions shall possess a relatively low degree of viscosity and it may be that the esters of some of the higher mono-hydric alcohols or glycols will themselves be too viscous; these are to be regarded as excluded from the scope of the invention, at least in so far as it is concerned with the production of stencil  
50 sheets with the aid of aqueous disperse systems including gelatinizing organic colloids dispersable in water and an ester of the character specified as the main tempering agent.

55 In conclusion it is to be observed that the expression "higher hydroxy fatty acid" as used herein means hydroxy fatty acids having a number of carbon atoms in their molecules not less than six and more especially  
60 such acids as have a number of carbon atoms in the neighbourhood of 16 to 18.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. Stencil sheets for use in duplicating, the coating compositions of which include a  
70 gelatinizing organic colloid and a higher hydroxy fatty acid ester of a di-hydric alcohol.

2. Stencil sheets for use in duplicating, the coating compositions of which include a  
75 gelatinizing organic colloid and a higher hydroxy fatty acid ester of a glycol.

3. Stencil sheets for use in duplicating, the coating compositions of which include a gelatinizing organic colloid and a ricinoleic  
80 acid ester of a glycol as tempering agent.

4. Stencil sheets adapted to be stenciled by pressure in a substantially air-dry state comprising an ink-resisting coating which includes a gelatinizing organic colloid and a  
85 ricinoleic acid ester of a glycol.

5. Stencil sheets for use in duplicating, the coating compositions of which include a gelatinized protein and a higher hydroxy  
90 fatty acid ester of a di-hydric alcohol.

6. Stencil sheets for use in duplicating, the coating compositions of which include a gelatinized protein and a higher hydroxy  
95 fatty acid ester of a glycol.

7. Stencil sheets for use in duplicating, the coating compositions of which include a  
95 gelatine and a ricinoleic acid ester of a glycol as tempering agent.

8. Stencil sheets adapted to be stenciled by pressure in a substantially air-dry state  
100 comprising an ink-resisting coating which includes a gelatine and a ricinoleic acid ester of a glycol.

9. Stencil sheets for use in duplicating, the coating compositions of which include a  
105 gelatinizing organic colloid and a higher hydroxy fatty acid ester of an alcohol containing not more than two hydroxyl groups in the alcohol molecule.

10. Stencil sheets for use in duplicating, the coating compositions of which include a  
110 gelatinizing organic colloid and a ricinoleic acid ester of an alcohol containing not more than two hydroxyl groups.

11. Stencil sheets for use in duplicating, the coating compositions of which include a  
115 gelatine and a ricinoleic acid ester of an alcohol containing not more than two hydroxyl groups.

12. A stencil sheet for use in duplicating  
120 comprising a coating composition including a gelatinizing organic colloid dispersable in water in association with an ester of a higher hydroxy fatty acid containing not more than  
125 two hydroxy fatty acid radicles in the ester molecule.

In testimony whereof I have signed my name to this specification.