Patented Dec. 29, 1942 2,306,863

UNITED STATES PATENT OFFICE

2,306,863

METHOD OF DUPLICATING

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No Drawing. Application May 31, 1941, Serial No. 396,189

3 Claims. (Cl. 101—149.5)

The invention relates to an improvement in duplication inks and to a method of using same.

An object of the invention is to provide a duplication ink having peculiar and advantageous surface properties and by virtue of these properties particularly adapted to applications requiring selective absorption of ink on surfaces to which it has been applied, as well as easy removal of the same ink by a simple wiping operation from those parts of said surface which are not adapted to absorb the said ink.

With the development of the relief printing sheets adapted for use in hectograph reproduction of photographs and fully disclosed in the patent application Serial No. 282,200, filed June 30, 1939, by William J. Champion, it became necessary to provide an ink which would be readily absorbed by the ink receptive parts of such relief printing sheets and which could also be rapidly, easily, and completely removed from the non-ink receptive parts.

Hectograph inks of types previously used have been either straight dye solutions or have been suspensions of a solid dye material in a substantially non-dye solvent vehicle; neither of these types of inks known to prior art is suitable for the application indicated above. Inks of the type containing solid dye or non-dye solvent vehicles are not readily absorbed by the ink receptive parts of the relief printing sheets for hectograph reproduction of photographs. On the other hand, inks constituting straight dye solutions, while having good penetrating properties, are extremely difficult to remove from those parts of the relief printing sheet or the master sheet on which the presence of ink is undesirable during the duplication step. For these reasons, no duplication ink previously known has been found entirely satisfactory for the purpose of these new processes.

It has now been found that inks which are emulsions of non-dye solvent oily material in a water miscible dye solution are far superior for the purposes indicated.

The water miscible dye solution is preferably a concentrated, although preferably not saturated solution of duplication dyes, such as basic dyes exemplified by methyl violet, Fuchsin S, auramines, crysoidine, Victoria blue, Victoria green and the like, but which may also be acidic dyes substantially non-reactive with gelatin such as fluorescein, methamine dyes and the like.

To facilitate the formation of the emulsion and to increase its stability, the ink may contain emulsifying or stabilizing agents such as, for example, ethanolamines, esters and salts of long chain fatty acids, particularly esters of long chain fatty acids with polyhydric alcohols, such as glycol oleate, glycerol stearate and the like.

The preferred oils are those having non-tanning properties so as not to deleteriously affect the surface of a gelatinous hectograph blanket. For this reason non-drying oils are not as suitable for the principal purpose of this invention as are the mineral oils and non-drying vegetable oils and other oily or water insoluble materials which have no tanning effect on gelatin.

It is found that an oil in water type emulsion ink of the character described is superior for the purpose intended.

To more clearly set forth the practice in accordance with the invention and to more specifically point out the nature of the product and process contemplated thereby, several specific, illustrative examples are hereinafter set forth, it being understood that these examples illustrate several embodiments which have given satisfactory results and are not intended to restrict the invention thereto.

Example I

Metyl violet	parts by weight	25
Ethylene glycol	do	25
Water	do	50
Mineral oil	grams	50
Triethanolamine	do	5

Agitated vigorously until an emulsion is formed.

Example II

	Parts by weight
Crystal violet	10
Water	100
Light mineral oil	50
Sodium oleate	5

Agitate as in Example I.

Example III

	Parts by weight
Methyl violet	25
Ethylene glycol	25
Water	25
Ethyl alcohol	25
Castor oil	50
Sodium lauryl sulphate	2

To apply the invention, any of the above compositions may be applied to a relief printing sheet adapted for use in hectograph reproduction of photographs as disclosed in Champion application Serial No. 282,200. The ink may be applied simply by pouring onto the relief printing

sheet and leaving it in contact therewith for a period sufficient for the absorption of the dye into the dye receptive parts of the sheet, which usually requires from about five seconds to about a minute. The ink is then wiped off with a piece of cotton or cloth moistened in a non-dye solvent such as trichlorethylene, benzene or the like. The ink is retained in the receptive parts of the printed sheet and is completely removed by the simple, rapid, wiping operation from the other parts thereof.

It is understood that the term "oil" has the broad meaning commonly used in emulsions and is not restricted to mineral oils and vegetable oils per se.

Obviously the invention is capable of wide variations without departure from the spirit or scope of this invention. The specific substances and procedure mentioned above have been given only to illustrate the invention and should not be construed in any sense of limitation.

I claim:

1. In a hectograph duplication process involving the use of a copy mass having a relief image, the step of contacting said copy mass with an ink comprising an emulsion of an oil in a water miscible dye solution.

2. In a hectograph duplication process involving the use of a copy mass having a relief image, the steps of contacting said copy mass with an ink comprising an emulsion of an oil in a water miscible dye solution, and wiping off excess ink with a non-solvent for said dye.

3. In a hectograph duplication process involving the use of a copy mass having a relief image of an incompletely tanned gelatin, the steps of contacting said copy mass with an ink comprising an emulsion of a non-tanning oil in a water miscible dye solution, and wiping off excess ink with a non-solvent for said dye.

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