

UNITED STATES PATENT OFFICE

2,013,291

INK

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No Drawing. Application July 6, 1929,
Serial No. 376,492

5 Claims. (Cl. 134—31)

The object of my invention is to provide an improved ink, peculiarly suited for transfer printing dye processes employing a solvent for the coloring matter to bring about or assist in the transferring operation, but which is suited for other purposes as well. By "transfer printing dye processes", it will be understood that I am referring to those processes in which the subject matter is initially printed on sheets of paper or the like, and thence, and sometimes a considerable time thereafter, is reproduced on the desired articles or materials, by bringing the articles or materials into contact with the printed sheets, usually with some pressure, in the presence of the solvent, with the result that the reproduction is by dyeing the article or material.

According to my invention the coloring matter employed in the ink is a soluble dye, rather than a lake or other form of pigment; that is to say, it is a soluble substance capable of directly dyeing animal or vegetable fibres from solution. Furthermore, it is a dye of that class which is substantially insoluble in water but soluble in alcohol or other selected transfer solvent. The vehicle portion of the ink, like the vehicles of printing inks generally, must serve to give those characteristics needed for printing; that is to say, it is a material or materials capable of giving to the ink that viscosity, tacky, or greasy nature, and whatever other characteristics that may be required of the inks used in the particular process employed for laying down the ink; for example, for laying down the ink on sheets of paper or the like from which the transfers are made to the materials or articles which are to receive the markings in the end. Therefore the coloring matter of my ink is a dye as before described, soluble in alcohol or other suitable transfer solvent before dyeing and substantially insoluble in water after becoming affixed to or combined with (i. e., dyed to) the fibres of the article or material ultimately receiving the marking. The vehicle is one serving to give the ink those characteristics required of inks used in the particular process used in laying down the ink initially, is a material or materials that is substantially non-volatile in whole or considerable part so that it will remain on a surface on which it may be printed and thus continue to act as a carrier for the dye after printing, and is substantially composed of a substantially non-drying oil or fat, or oils or fats, and especially a non-drying animal or vegetable oil or fat. These oils or fats may be thickened as desired or necessary by various substances inert to the dye; preferably I em-

ploy as a thickener an alcohol-soluble resin or gum such for example as rosin, shellac, elimi, mastic, sandarac, etc. The thickening substance may be mixed into the oil or fat prior to the inclusion of the dye; heat can be used as necessary to assist in securing a thorough mixing of the components. The dye, rather than being carried in the vehicle in solution, exists in the vehicle in a solid state, although finely divided and thoroughly distributed through the vehicle. Accordingly the vehicle material or materials, e. g. the oil or fat, and the dyes are so chosen that the dye is substantially insoluble in the vehicle. The dye can be gotten into the vehicle in this solid state by grinding finely powdered dye into the vehicles in the manner that pigments are so ground into the vehicles of known inks. If and as necessary this ink mixture can be thinned somewhat by the addition of thinner substances, inert to the dye but miscible with the vehicle; xylol, toluol, benzol, etc. will serve as examples; these particular thinners do not seem to materially reduce the color strength or tinctorial value, probably because of their volatility. Furthermore, the initial ink mixture can be thickened by adding more of the oil or fat or resin or gum in suitable quantities and proportions; this, however tends to reduce the color strength.

Preferably I use castor oil thickened with rosin as the vehicle. Having thickened castor oil sufficiently with rosin dissolved in the oil with the aid of heat, I grind into this vehicle a finely powdered dye of the desired color and which is soluble in alcohol but is substantially insoluble in water and in the vehicle. If and as necessary, I afterwards thin the mixture with one of the thinners mentioned, or thicken it by adding more of a castor oil and resin mixture.

This ink can be used for various purposes as before pointed out, but is peculiarly suited for the transfer printing processes of the type before mentioned since it permits the use of such substances as the alcohols as the transfer-solvents. Apparently because of their high degree of capillarity, such solvents act to effect the transfer without noticeable bleeding or blurring of the image. Furthermore, the water-insoluble nature of the dye permits, without detriment, the presence of some water in the solvent. Still further, dyes of the character herein indicated, that is to say water-insoluble dyes soluble in alcohol, present a wide range of fast colors which are insoluble, or soluble only to a very slight degree, in a wide range of substances suitable for ink vehicles.

To the contrary, dyes soluble in both water and alcohol are usually not as fast as desirable and frequently are soluble in acceptable vehicles to such degree as to produce noticeably blurred prints.

While I have referred in terms to the incorporation of but a single dye in an ink, it is obvious that two or more dyes may be used in the same ink.

10 It will be understood that my invention is not limited to the details above described except as appears hereinafter in the claims:

1. An ink consisting of a dye substantially insoluble in water but soluble in alcohol, existing in a solid state intermixed with a substantially non-drying vehicle including a substantially non-drying oil or fat in which the dye is substantially insoluble.

2. An ink consisting of a dye substantially insoluble in water but soluble in alcohol, existing in a solid state intermixed with a vehicle includ-

ing a substantially non-drying animal or vegetable oil or fat in which the dye is substantially insoluble.

3. An ink consisting of a dye substantially insoluble in water but soluble in alcohol, existing in a solid state intermixed with a substantially non-drying vehicle consisting of a substantially non-drying oil or fat in which the dye is substantially insoluble thickened with an alcohol-soluble resin or gum.

4. An ink consisting of a dye substantially insoluble in water but soluble in alcohol, existing in a solid state intermixed with a vehicle consisting of castor oil thickened with an alcohol-soluble resin or gum.

5. An ink consisting of a dye substantially insoluble in water, but soluble in alcohol, existing in a solid state intermixed with a vehicle consisting of castor oil thickened with rosin.

ADOLF SCHUBERT.