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COMPOSITION FOR PRINTING INKS FOR TRANSFERS.

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To all whom it may conern:

Be it known that we, TROWBRIDGE MARSTON and IRA F. B. HUTTON, citizens of the United States, residing at Morristown, in the county of Morris and State of New Jersey, and at Woodhaven, in the county of Queens and State of New York, respectively, have invented certain new and useful Improvements in Compositions for Printing Inks for Transfers, of which the following is a specification.

Our invention relates to a new and improved composition for printing inks for transfers.

For many years transfers having an ink which is solid at ordinary temperatures have been used for impressing designs upon fabrics and articles made of leather or fabric.

It has been customary to heat the ink until it became liquid and then print therewith upon a sheet of paper by means of a die having the desired figure, word or the like engraved therein. The ink quickly solidified upon the paper producing a reverse impression of the design, word or the like intended to be transferred and when this transfer was laid upon the article upon which it was intended to make the impression, and heat and pressure were applied as for example by means of a hot iron, the solidified ink again melted and was transferred to the article.

Up to the present time a number of serious defects have existed in such inks. It has not been possible hitherto to produce an ink which was flexible and which would adhere to the article with sufficient tenacity so that if the said article was bent or crumpled, the ink would flake and the desired impression would be lost. For example, it has been very common to impress trade marks by the ink and method before mentioned, upon hosiery and similar articles of wearing apparel which are rumpled and bent when used and the flaking of the ink has been particularly objectionable in this connection.

It has hitherto not been possible to produce an ink which could be scraped off satisfactorily from the said die, so that only the engraved part of the said die carried the ink. As a result thereof, some of the ink was impressed upon the leather, fabric or other article, at a point where it was not desired. This result was called "bleeding" and it was particularly objectionable especially in making impressions upon white fabrics for embroidering purposes.

It has also been hitherto not possible to produce gold and silver colored transfers which would have the desired brilliancy and sharpness of definition.

The objects of our invention are chiefly to produce a flexible ink which will adhere with great tenacity both to the paper and to the article upon which the impression is finally made and which will be perfectly flexible.

Another object of our invention is to produce an ink having these desirable characteristics, which will be hard even in the summer time, so that it can be readily handled, as a sticky ink is objectionable.

Another object of our invention is to produce an ink whereby the phenomenon of "bleeding" can be obviated and which will produce a brilliant impression when a gold or silver color is employed.

Other objects of our invention will be set forth in the following description which illustrates preferred examples thereof.

We have given two examples of our invention, one intended to be used for impressing designs to be embroidered upon fabrics and the other to be intended for impressing trade marks and the like upon colored fabrics.

An example for producing designs to be embroidered is as follows:—

The ingredients used are preferably eleven pounds of rosin or colophony, five pounds of beeswax, four pounds of ultramarine blue or seven pounds of chrome yellow, depending upon the color desired; eight ounces of Venice terpentine which is pref-

erably a true Venice turpentine; twelve ounces of lithographic varnish No. 8, which is a technical term for boiled linseed oil which has been boiled to a certain consistency; one pound of gum elemi.

The rosin causes the ink to be sticky so that it will adhere to the object.

The beeswax is employed because when heated, it penetrates the fabric and carries along the color with it into the pores thereof. The turpentine is used because of its adhesive or sticky qualities and because it imparts an elastic, rubber-like quality to the ink. This is because the said turpentine dries very, very slowly, so that when the ink has been used for making the impression upon the article, the rosin causes a surface drying in a comparatively short time, but the body of the ink remains soft for a very long time so that the body of the ink can readily bend and will not flake off. The boiled linseed oil or lithographic varnish has a combined action with the beeswax of causing the ink to be readily released from the paper and it also enables the die to be wiped clean by means of a sharp blade as is well known, so that there will be no "bleeding." The gum elemi assists in imparting a certain elasticity to the ink and it cooperates in this with the turpentine. However, the gum elemi can be omitted if enough turpentine is used.

There may be considerable variation in the above proportions and in the ingredients which may be substituted for those before mentioned, and as we believe that this is a pioneer invention, we desire to carefully state the most important of these variations.

For example, from nine to fifteen pounds of rosin may be substituted for the amount above given. From one to seven pounds of beeswax can be substituted for the amount before given, but if the amount of beeswax is diminished, then the proportion of boiled linseed oil or lithographic varnish must be increased. For example, if only one pound of beeswax is used then about thirty ounces of the said lithographic varnish should be used, and if seven pounds of beeswax is used then only four ounces of the said varnish are necessary. From three to seven pounds of ultramarine blue and from three to ten pounds of chrome yellow may be employed for the above purpose, depending upon the intensity of the shade employed.

From four to twelve ounces of the turpentine may be used and from one-quarter of a pound to three pounds of the gum elemi may be employed, but since the rosin, the turpentine and the gum elemi cooperate in making the ink adhesive, a diminution of the amount of one ingredient may be counterbalanced by the increase in the amount of the other equivalent substance or substances.

In preparing impressions of trade marks or the like for black or other colored fabrics, the following ingredients and proportions have been found efficient:

Sixteen pounds of rosin; one pound of beeswax; one and one-half pounds of turpentine, preferably the true Venice turpentine, and it may be noted at this point that a so-called imitation Venice turpentine made of a mixture of domestic turpentine and rosin, may be substituted for the true Venice turpentine; three and one-half pounds of the said lithographic varnish No. 8. It is to be understood that we do not limit ourselves to the No. 8 lithographic varnish as other grades may be employed without, however, giving as good a result as the No. 8.

The amount of rosin can be varied from ten to twenty pounds. The amount of beeswax can be varied from four ounces to ten pounds. The amount of turpentine can be varied from one ounce to three pounds, and the amount of lithographic varnish can be varied from one pound to six pounds, it being understood as before mentioned, that where certain of the ingredients unite in producing a common result, that an increase in one of said ingredients should be counterbalanced by a diminution in the other.

The color effects for trade mark transfers are secured by adding to the ink made up as before mentioned, the following substances:

Gold bronze, silver bronze, and other bronzes in general; ultramarine blue and chrome blue; chrome yellow in the various shades thereof; lamp black, bone black, vegetable black, ivory black and drop black; chrome green in the various shades thereof; red in the vermillion and scarlet shades; purple and brown.

Besides the above mentioned colors which are pigments, the aniline colors in various shades may be employed, and other colors, the lake colors, may be employed by combining the aniline colors with lithopone, pure oxide of zinc, pure stearate of zinc, whiting and lead whites.

If aniline colors are not employed, the ink is prepared by melting the rosin and beeswax together by placing them in a vessel which is heated, and stirring them together. The turpentine and lithographic varnish are then added and stirred. It is preferable not to heat the said ingredients or ink above 200° Fahr., either in the manufacture of the ink or in the application thereof in the transfer. This temperature limit is desirable because otherwise the properties of the rosin and beeswax are injured.

After the said ingredients have been thoroughly intermixed, then the colors are slowly added and mixed therewith.

If aniline colors are employed, it is pref-

erable to first melt the beeswax in a separate vessel and then add these colors slowly with constant mixing.

The rosin has been melted in a separate vessel and the melted mixture of beeswax and aniline colors are then added very slowly and with careful and continuous mixing.

If it is desired to utilize the colors which we have called lake colors, then after the aniline dyes have been handled in the manner before mentioned, the lithopone or the other substances mentioned in connection therewith are slowly added to the melted ink in powdered form.

Of the ingredients before mentioned in connection with the manufacture of the lake colors, we prefer to use oxide of zinc. This is because the oxide of zinc has a certain lubricating quality which causes the colors to become smooth and durable.

Instead of the rosin before mentioned, the following gums may be substituted:

Copal, gum mastic, Manila gum, kauri gum, Zanzibar copal, shellac, sticklac, gum dammar, gum tragacanth, pitch and unvulcanized rubber.

Of course, some of these substitutes must be treated in the manner well known in the arts and in order to make them of the same consistency and softness as the said colophony. For example, the rubber would be treated with ether and it would be used in small quantities.

Instead of the beeswax, the following waxes may be substituted:

Carnauba wax, ceresin, Japan wax, Montan wax, ozokerite, paraffine residues and marble wax.

Instead of the boiled-up raw linseed oil before mentioned, preferably used in the form of varnish No. 8, the following substances may be used, suitably boiled or otherwise treated so as to make them sufficiently consistent:

Castor oil, China nut oil, cocoa fat, cocoanut oil, corn oil, cottonseed oil, fish oils, animal oils such as lard, seal, tallow, whale, oleo, and the like, and paraffine oil, and various other vegetable oils such as wood oil, peanut oil, pine oil, rapeseed oil, red oil, rosin oil, sesame oil, soyabean oil, tar oil and the like.

Copal varnish could be used instead of the Venice turpentine.

We have endeavored to carefully state the various ingredients which may be used for our purposes and the various preparations of some of them which will give good results, but we wish to make it clear that these are only stated as preferred ingredients and proportions and we are not limited thereto, as changes and omissions can be made without departing from the spirit and scope of our invention.

Since the ink is not sticky when in the solid state, it makes no difference if a certain amount thereof is allowed to solidify in the machine when for example, the operation of the machine is stopped at the end of the working day, because the ink melts without sticking to the die when it is again heated, so that all "bleeding" is obviated.

Wherever certain substances are referred to in the claims, we wish it clearly understood that such reference includes the substances equivalent thereto, some of which are particularly set forth in the description.

We claim:

1. A solid fusible adherent, non-smeary transfer ink which is flexible in the form of a thin layer, said ink being resistant to heat and pressure and being adapted to resolidify after having been subjected to heat and pressure in the form of a thin, adherent, flexible layer.

2. A solid fusible, adherent, non-smeary transfer ink resistant to heat and pressure, a layer of said ink being adapted to have the outside portion thereof affected upon exposure to the air so that the said outside portions thereof become harder than the interior of said layer, said ink being resistent to heat and pressure, and being adapted to resolidify after having been subjected to heat and pressure in the form of a thin, adherent layer.

3. A solid, fusible, adherent, non-smeary transfer ink resistant to heat and pressure, said ink being adapted to resolidify after having been subjected to heat and pressure in the form of a thin, adherent layer, said ink containing a quick-drying substance and a slow drying substance.

4. An ink according to claim 1, containing turpentine.

5. An ink according to claim 1, containing Venice turpentine.

6. An ink according to claim 1, containing rosin and Venice turpentine.

7. An ink according to claim 1, containing rosin and Venice turpentine, the amount of said rosin present being greater than eleven times the amount of said Venice turpentine.

8. An ink according to claim 1, containing rosin, beeswax, Venice turpentine, boiled oil and coloring matter.

9. An adherent transfer ink containing beeswax and boiled linseed oil, the amount of the said beeswax present in the said ink being substantially forty times the amount of the said boiled linseed varnish present in the said ink.

10. A method of making a transfer ink which consists in melting rosin and beeswax together and adding to the melted mixture turpentine and boiled linseed oil.

11. A method of making a transfer ink which consists in melting rosin and beeswax together and adding to the melted mixture turpentine and boiled linseed oil, the tem-

perature of the said ink being always kept below 200° F.

12. In the art of making a transfer ink containing a lake color produced by a reaction with an aniline color, those steps in the art which consist in mixing the said aniline color with beeswax, mixing the aniline color so incorporated with the other ingredients of the said ink, and then adding zinc white to the melted ink.

In testimony whereof we hereunto affix our signatures.

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