UNITED STATES PATENT OFFICE.

FREDERICK B. CANODE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE A. B. DICK COMPANY, OF SAME PLACE.

INK.

SPECIFICATION forming part of Letters Patent No. 617,315, dated January 10, 1899.

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To all whom it may concern:

Be it known that I, FREDERICK B. CANODE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Inks, of which the following is a specification.

My invention relates to an improved ink for use with type-writing or autographic stencil-printing machines, and my improved ink is particularly adapted for use with those varieties of such stencil-printing machines wherein the ink is protected from exposure to the air and wherein an inking-pad is employed by which the ink will be properly and evenly distributed upon the stencil-sheet, so that when the latter is engaged with the work an impression will be produced by the forcing of the ink from the pad through the figures, letters, or other characters formed in the stencil-sheet by removing the wax coating therefrom, but without affecting the highly-porous or veil-like body thereof.

In order that the best results may be obtained in stencil-printing work, the wax coating of the stencil-sheet should be relatively soft—that is to say, it should be formed of a mineral, animal, or vegetable wax or wax-like material having a relatively low melting-point. I find that the inks which are at present employed on the market for this work tend to affect the wax coating, and particularly when such coating is relatively soft, so as to produce a roughened or irregular appearance on the edges of the letters or other characters, and in a short time the copies produced become very imperfect. An ink suitable for the best stencil-printing work should therefore be absolutely neutral to the stencil-sheet, so that it will not in any way affect the appearance of the work. An ink adapted expressly for use with stencil-printing machines of the type referred to should be capable of flowing with sufficient rapidity through the pad as to accommodate the number of copies being made, and while the ink should be capable of distributing itself evenly throughout the entire surface of the pad it should yet be sufficiently viscous as not to flow through the openings in the stencil-sheet, except when the stencil-sheet is impressed with the desired pressure upon the work. A perfect ink for this purpose should also be capable of drying very rapidly, so that the work when finished will retain a clear-cut appearance without danger of smearing. The requirements of practice also demand that a suitable ink for the purpose should have no tendency to run or spread after having been applied to the sheets of paper, and also that the ink should be practically homogeneous, so that there can in use be no settling or separation into layers of the various ingredients thereof. Finally, in some instances it is desirable that an ink should be produced having all the characteristics above referred to and at the same time capable of allowing press-copies to be made in the usual way.

I have invented an improved ink which is absolutely neutral to stencil-sheets having wax coatings which are relatively soft, which ink is of such a consistency that in a stencil-printing machine of the type referred to it will distribute itself evenly throughout the pad without, however, percolating through the perforations in the stencil-sheet, but allowing for an impression to be made through such perforations when the desired pressure is applied, which ink will be absolutely homogeneous in its composition and will not separate into layers or into its respective ingredients even when allowed to stand for very long periods of time, which ink will almost instantly dry after having been imprinted upon the impression-paper, which will have no tendency to run or spread, and which can be made so as to allow press-copies to be produced.

In carrying out my invention I first produce a suitable relatively soft pure soap (preferably that known to the trade as "German green soap" and now used principally for surgical purposes) which will contain no free alkali and which is absolutely neutral to stencil-sheets having wax or wax-like coatings, even when the wax or wax-like material is of a relatively low fusing-point. This soap I dissolve in a suitable carrying material, such as glucose or glycerin, and to the heavy or paste-like solution thus produced I add a suitable proportion of coloring-matter or pigment, which coloring-matter or pigment is prefer-

ably soluble both in water and oil, and hence will be soluble in the mixture of soap and glycerin or glucose which has been obtained. The resulting mass may be then reduced to the required consistency by the addition of a sufficient quantity of water, and the resulting material will be a homogeneous quick-drying (in some instances copying) ink of the required consistency neutral to all stencil-sheets and capable of effective use in the type of stencil-printing machines to which I have referred, but also suitable for use in other stencil-printing machines and for such other work as may be found in practice to which it is capable of being applied.

In making my improved ink I prefer to proceed substantially as follows: A German green soap is made by saponifying one part, by weight, of purified linseed-oil with two parts, by weight, of liquid potassium, (*United States Pharmacopœia,*) the saponification being carried out in the presence of heat in a soap-kettle in the usual way. The same, or practically the same, soap may, however, be made in any other suitable way. Care should be exercised in the manufacture of this soap to prevent the presence in the soap of any free alkali. I take about thirty parts, by weight, of the soap thus obtained and mix it with forty parts, by weight, of glycerin or glucose, this mixture being secured in the presence of heat, preferably that obtained by the injection of free steam into the mixture, so that there will be no danger of the soap becoming melted. Under the effect of the gentle heat produced by the injection of free steam the soap will be entirely dissolved in the glycerin or glucose. With the heavy pasty solution thus obtained, preferably while hot, I mix or dissolve a sufficient quantity of coloring-matter or pigment and preferably a coloring-matter or pigment which is soluble in water and oil, so that the resulting-ink will be homogeneous and will not be simply a mixture or aggregation of ingredients as is the case with most inks now on the market. The quantity of coloring-matter or pigment used and the manner in which it is added to the solution of soap and glycerin or glucose depend upon the character of the pigment used and the intensity of the ultimate color which is desired. As an example of ink which I have made, so-called "oil-colors," such as are made by Sainte Denis Chemical Co., of Paris, France, may be considered a good illustration, such colors being soluble in water and oil. Taking, as an instance of a suitable oil-color which may be used, the so-called "oil violet," as known to the trade, one part, by weight, of that color may be dissolved in thirty-two parts, by weight, of the soap solution. In adding such a coloring material or pigment to the solution I first dissolve the color in a small quantity of the solution, and then slowly add the color solution thus obtained to the soap-solution originally secured, preferably while the soap solution is hot or at least warm. The product obtained by these operations is then allowed to "set" for a sufficient time, or in the present instance for a week or ten days, during which time a gradual assimilation takes place, so that the resulting ink will be homogeneous and even-colored throughout and of about the consistency of thick molasses. Enough hot or warm water is then added to the mass as to result in the desired consistency thereof.

When glucose or other similar saccharine or syrupy solution is employed as a solvent for the soap, the resulting ink will be adapted for press-copying purposes; but when glycerin is employed as a solvent the resulting ink, while being considerably smoother in appearance, may not be adapted for the making of press copies.

Instead of using glucose or glycerin as the solvent for the soap any other suitable soap solvent which will be neutral to the stencil-plate may be employed.

I find my improved ink, in addition to possessing the characteristics to which I have referred, is not in any sense tacky, as is the case with printers' ink, so that there is no tendency of the ink to injure or affect in any way the stencil-plate during the process of printing.

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

1. An improved ink for use with waxed stencil-sheets, consisting of a soap neutral to the waxed sheet, an approximately equal or slightly greater quantity of a solvent of said soap such as glycerin or glucose, and a suitable pigment, substantially as set forth.

2. An improved ink for use with waxed stencil-sheets, consisting of a soap neutral to the waxed sheet, an approximately equal or slightly greater quantity of a solvent of said soap such as glycerin or glucose, and a pigment dissolvable in the soap solution, substantially as set forth.

3. An improved ink for use with waxed stencil-sheets, consisting of a soap neutral to the wax coating, an approximately equal or slightly greater quantity of glucose, and a suitable pigment, substantially as set forth.

4. An improved ink for use with waxed stencil-sheets, consisting of German green soap, an approximately equal or slightly greater quantity of glycerin or glucose, and a suitable pigment, substantially as set forth.

This specification signed and witnessed this 16th day of May, 1898.

FREDERICK B. CANODE.

Witnesses:
FRANK L. DYER,
JNO. R. TAYLOR.