

UNITED STATES PATENT OFFICE.

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PRINTING OR STAMPING INK.

SPECIFICATION forming part of Letters Patent No. 437,781, dated October 7, 1890.

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To all whom it may concern:

Be it known that I, CHARLES M. HIGGINS, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Printing or Stamping Inks, of which the following is a specification.

My invention applies more especially to inks for hand-stamps of rubber or metal and for type-writers and other small printing-machines where a non-drying ink is required which will last indefinitely on the inking device without drying or hardening, and yet give a good impression, whether used occasionally or constantly. As is well known, all inks at present used for these purposes are of either of two classes, the one of which consists of glycerine holding aniline colors in solution, the other being formed of a fatty, waxy, or oily vehicle having permanent pigments or analine colors incorporated therewith in more or less pasty form, but not existing in a state of solution with the unctuous vehicle. The objection to the glycerine inks is that the vehicle is perfectly soluble in water and very hygroscopic, or susceptible to atmospheric moisture, so that the ink is continually influenced by the relative moisture or dryness of the air, which is a constant element of irregularity in the inking and printing action, causing the ink to print too freely on a moist day and too feebly on a very dry day, which becomes quite objectionable in type-writing and similar machines. Another serious objection to the glycerine inks is that as both the vehicle and pigment of the ink are intensely soluble in water the ink does not dry or set quickly on the paper and will blur or smudge very easily in contact with moisture or with the fingers of the manipulator. The objection to the fatty or unctuous inks is that they are only mechanical mixtures of the coloring-matter with the vehicle and do not hold the color in solution in the vehicle, and hence lack fluidity and smoothness and fine distributing qualities and print in a heavy blurred manner, besides lacking good lasting qualities on the inking device. These objections have recently created a strong demand for an improved ink which

will entirely dispense with the glycerine vehicle or any vehicle soluble in water or affected by atmospheric moisture, but which shall employ instead an oily or unctuous vehicle which shall hold the coloring-matter in actual solution and yet be non-drying or capable of lasting indefinitely in a soft state upon the inking device, though exposed freely to the air, and at the same time the ink should dry or set quickly when printed on the paper and not be liable to blur or smut by contact.

My invention consists in an improved ink possessing the above-named characteristics, produced by dissolving aniline or other colors in the essential oils obtained from the well-known spices—such as cloves, cinnamon, or allspice—as hereinafter set forth.

It appears that hardly any of the ordinary known fixed animal, vegetable, or mineral oils have any dissolving power on the aniline or other colors suitable for inks. A few of them will dissolve a very small percentage of some of the aniline colors, but not sufficient for the purpose of such an ink as my invention contemplates. I have discovered, however, that the basis of several of these oils—oleic acid—when isolated forms a powerful solvent for some of the aniline colors, particularly methyl-violet, as set forth in a separate application for patent. I have also found that the essential oils of the common spices, more especially cloves, cinnamon, and allspice, are perfect solvents for most of the aniline colors and some other coloring-matters, and while technically volatile oils I find that they are the least volatile of the series and are practically fixed and will form a non-drying oily or unctuous ink holding the color in absolute solution and having great lasting qualities on the inking device. These spice-oils have a much greater range of solubility than the oleic acid—that is, will dissolve a greater variety of colors. Thus the oil of cloves will dissolve the violets, several of the blues, green crystals, several of the reds, yellows, and other colors. It will also perfectly dissolve Chinese blue and partly dissolve carmine and ultramarine blue. The oil of cinnamon will act about the same as the oil of cloves, except that it is a much poorer solvent for the

green and a better solvent for the yellow. The oil of allspice is not to be preferred to either of the others for any of the colors except the reds. Oil of black pepper is a good solvent for orange.

In making a violet ink, therefore, I would take oil of cloves or oil of cinnamon and stir into the same methyl violet in powdered, lump, or granular form and allow the same to remain until thoroughly dissolved, stirring occasionally. These oils will dissolve almost one-third of their weight of violet, forming a liquid oily ink of intense coloring-power, and they will make a strong solution whether used hot or cold; but the solution will be effected more rapidly if made in the hot oil. The ink thus made is admirably adapted for typewriters, as it lasts indefinitely on the inking device without drying and is entirely unaffected by the condition of the air and is proof to moisture. It will be absorbed evenly by the pad, roller, ribbon, or other inking device, will distribute very smoothly on the types or stamps, and give a strong and sharp impression on the paper. The impression will dry or set almost immediately on the paper and bear contact without blurring, because the vehicle is insoluble in water and the color is in actual solution in this vehicle. As, however, the color is intensely soluble in water, a perfect press-copy of the impression can be obtained in the usual manner. This same ink can also be used for rubber stamps with great advantage.

I find that while oil of cloves and oil of cinnamon-leaf will act on rubber energetically if left long in contact therewith, yet, strange to say, the oil of cinnamon-bark (cassia) has no action on rubber. Hence for rubber stamps which rest normally against the inking-pad the ink should be made with the oil of cassia. For stamps which are detached from their pads and only temporarily pressed thereon the ink can be made of either of the other oils.

To make a green ink, I dissolve green crystals in the oil of cloves, preferably hot, although a very strong solution can be made cold. Any of the different greens known as "green crystals" can be used, and will dissolve freely in the oil of cloves. The oil of cinnamon should not be used, as it can dissolve only a small part of the green. The amount of green used will of course depend on the strength of the ink desired; but the oil of

cloves will dissolve nearly one-third of its weight before reaching the point of saturation. This will form an intense green oily ink having great lasting power on the inking device, non-smutting when printed, very even in its impression, brilliant in color, and gives a good press-copy. Sometimes I prefer to add a portion of oleic acid to this green ink, about one-third to one-quarter of its bulk, which cheapens it without detracting from its good qualities. The same addition may be made to the violet ink made with the oil of cloves or cinnamon.

A blue ink may be produced by mixing the ink made with the methyl-violet with the ink made from the green crystals, the relative proportions of the violet and green inks determining the shade of blue desired.

A black ink can be produced by mixing the violet with the yellow or orange inks.

A permanent blue ink may be obtained by dissolving Chinese blue in oil of cloves, in which it dissolves and forms a useful ink for many purposes.

The solution of some of the aniline colors may sometimes be assisted by moistening the colors with alcohol before adding the oils; but only in some cases will this be necessary—for instance, with primrose-yellow and a few others.

It is not of course necessary to specify all the pigments that may be used, as any suitable pigment may be employed, and this will vary with the color and purpose of the ink required.

Carbon may of course be incorporated with any of the above-named mixtures.

In using oil of cloves either the oil of the buds or the stems may be used, and either the oil of the leaf or the bark of the cinnamon can be employed.

What I claim as my invention is—

1. A printing or stamping ink composed of an essential oil of the spices described, combined with an aniline color or dye dissolved therein, substantially as herein set forth.

2. A printing or stamping ink formed of oil of cloves and aniline-green crystals dissolved therein, substantially as herein set forth.

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Witnesses:

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FRED. WHITE.