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COPYING INK.

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To all whom it may concern:

Be it known that I, MATABEI SHINOZAKI, a subject of the Emperor of Japan, residing at No. 11 Midori-cho Gochome, Honjo-ku, in the city of Tokyo, Empire of Japan, have invented certain new and useful Improvements in Copying Inks, of which the following is a specification.

My invention relates to improvements in the manufacture of copying ink. The characteristic feature of the invention is to add an acid, e. g.; hydrochloric acid, or oxalic acid to a solution of ordinary material for copying ink such as methyl violet, magenta or malachite green, and thereupon to add a glutinous matter such as funori scientifically known as gliopeltis furcate, or gelatine, thereto. The object of the invention is to obtain numerous sheets of copying paper more clearly printed than by any ordinary copying ink, and also to obtain a copying ink which flows freely and uniformly, and yet is low-priced.

In carrying out the invention, either some methyl violet, or malachite green or magenta is dissolved in a proper quantity of water. The solution is made acidulous by adding thereto an acid, such as hydrochloric acid or oxalic acid, which, when combined with coloring matters, produces complex salt. Thereupon for the purpose of increasing the penetrating power, the said solution is mixed with a glutinous matter such as funori (paste made from sea-weed), gelatine, gum tragacanth, or isinglass, and after the mixture is fully heated and agitated, it is left standing for a proper time and thereafter decanted for use.

For instance, to manufacture violet copying ink, according to my invention:—In the first place, methyl violet of 200 grams is dissolved in water of 500 grams by heating, and hydrochloric acid (Twaddel 32°) of 100 grams is added to the solution. Then, funori of 20 grams is dissolved in water of 200 grams, and this is filtered, and to the filtrate, hydrochloric acid (Twaddel 32°) of 100 grams is added. This solution is mixed with the above mentioned coloring solution, and the mixture, being subjected to heating and agitation, is left standing for about a week after which the cleared up fluid for copying ink is obtained.

Funori is a sea-weed which is treated with water and rolled on a board to form a sheet. The latter is dried in the sun while being sprinkled, from time to time, with water. To make a paste from it, it is immersed in water and then is dissolved in water with heat. The solution is filtered through a cloth.

In the manufacture of the usual violet copying ink, methyl violet is merely dissolved in water, and to prevent the solution from becoming dried, either sugar or dextrin, or glycerine is added thereinto. But in this case, the penetrating power is very weak, and one sheet or two of faintly printed paper is or are produced with difficulty, and also in use, the solution does not, in many cases, flow freely and uniformly, and moreover, in the course of time, the solution suffers changes in quality till it becomes unfit for use.

Now in my invention, this drawback is overcome. I have found that certain acids, when combined with coloring matters, increase the penetrating power, and this discovery has been made use of in my new process. For instance, hydrochloric acid and oxalic acid when combined with coloring matters, form a complex salt strongly acidulous. Of course other acids capable of being used as equivalents can be substituted in the composition. So, when a sheet of paper written on with this salt is placed upon a layer of damped copying paper, and pressure is applied to it, the complex salt will undergo decomposition on account of the moisture, and one part thereof combining with the size in copying papers, makes it easy for the other coloring part to penetrate among the tissues, and consequently more numerous copies can be made than with any ordinary copying ink. Sugar, dextrin or glycerine hitherto in use as an agent for absorbing the moisture of an ordinary copying ink does not only retard the ink drying up, but also when a sheet of paper written upon with it, is placed on a layer of copying papers and is pressed down, the pressure will cause the ink to spread, and consequently the matter copied becomes indistinct.

In my new process, a glutinous matter, such as funori, gelatine, gum tragacanth, or isinglass, which is known to lose its stickiness against acid matters, is used. When any of these materials is mixed with ink, the writings produced with it soon dry, whereas in copying, since the penetrating power of the fluid is great, the use of

such materials is effective in making ink of superior quality.

What I claim is:—

1. The process of making copying ink which consists in adding a non-corrosive acid capable of forming a complex salt with basic dyes to a solution of a basic color, and then adding to this coloring solution a filtered solution of funori.

2. The process of making copying ink which consists in adding hydrochloric acid to a solution of a basic color, and then adding to this coloring solution a filtered solution of funori.

3. A copying ink made of a non-corrosive acid capable of forming complex salts with basic dyes, a solution of a basic color, and a filtered solution of funori.

4. A copying ink made of hydrochloric acid, a solution of a basic color, and a filtered solution of funori.

5. A copying ink made of hydrochloric acid, a solution of methyl violet, and a filtered solution of funori.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

MATABEI SHINOZAKI.

Witnesses:

T. C. SMITH,

E. L. MURRAY.