

UNITED STATES PATENT OFFICE.

ERNST KRETSCHMANN, OF GROSS LAFFERDE, GERMANY.

PAPER FOR SYMPATHETIC INK.

SPECIFICATION forming part of Letters Patent No. 673,400, dated May 7, 1901.

Application filed May 18, 1900. Serial No. 17,176. (No specimens.)

To all whom it may concern:

Be it known that I, ERNST KRETSCHMANN, a citizen of the Kingdom of Prussia, and a resident of Gross Lafferde, Germany, (whose post-office address is Gadenstedterstrasse 256,) have invented certain new and useful Improvements in Paper for Secret Correspondence, of which the following is a specification.

The object of my invention is a paper for secret correspondence which contains cobalt salts and on being written upon with a solution of common salt does not show the writing until it is heated. This paper is generally prepared by soaking unglazed writing-paper in a solution of a haloid salt of cobalt, some glycerin and gum-arabic being added to cause the salts to adhere to the paper. The use of this paper is based on the well-known fact that the haloid salts of cobalt when brought in contact with a solution of alkaline haloid salts, such as common salt, form compositions which attract water and are nearly colorless, while on being heated they lose their water and assume a blue color. On being cooled again these hygroscopic double salts attract water from the air and become colorless.

Now it has been observed that letters written on cobalt paper after having been exposed to the air for a time lose their distinctness of form and get illegible. The reason is that the haloid salt of cobalt is hygroscopic to a certain extent and attracts moisture from the air. The traces of salt solution forming the letters upon this paper soon begin to spread and after being heated appear as indistinct blots. To avoid this, I employ a paper containing a non-hygroscopic salt of cobalt, such as basic carbonate of cobalt, and I add to the writing fluid (common-salt solution) a substance which causes the cobalt salt in the places where the writing fluid has been deposited on the paper to be changed into a hygroscopic salt. In the case of basic carbonate of cobalt being employed an addition of common vinegar will suffice to produce hygroscopic acetate of cobalt.

The colorless non-hygroscopic salts of cobalt do not show any coloration when heated, nor do they readily enter into combinations

with the alkaline haloid salts. In the ordinary process the cobalt paper deepens in color on heating, the places written upon by salt deepening to a greater degree, whereas in the process described in this application the paper itself remains colorless on heating, the ink alone turning blue. The letters written on such a paper with a solution of common salt to which some acid has been added may therefore attract any quantity of water without influencing in the least the surrounding parts of the paper, which will always remain dry and colorless. A washing out of the letters thus formed is therefore made impossible by the nature of the paper.

The impregnation of the paper with non-hygroscopic cobalt salt may be effected in different ways. Either the paper is covered with a non-hygroscopic cobalt salt suspended in water, or the paper is impregnated with a hygroscopic cobalt salt which is then converted into a non-hygroscopic salt by suitable means. Thus a paper soaked in a solution of cobalt chlorid may afterward be treated with a solution of bicarbonate of soda, the resulting basic carbonate of cobalt being non-hygroscopic. Of course the paper may be directly impregnated with basic carbonate of cobalt or any other non-hygroscopic salt of cobalt. To the writing fluid, consisting of a saturated solution of common table-salt, a substance able to transform the non-hygroscopic cobalt salt into a hygroscopic one has to be added. In the case referred to above an addition of one part of vinegar to two parts of table-salt solution will suffice to cause the carbonate of cobalt in the places where the ink is deposited to be transformed into hygroscopic acetate of cobalt. A weak solution of vinegar alone without any common salt might be employed, though to less advantage, owing to the less distinctness of the writing on heating. On heating the paper treated in this way the writing will appear with absolute distinctness no matter how long the letter has been left exposed to the action of moisture.

Having thus described the nature of my invention, what I claim is—

Paper for secret writing, consisting of writing-paper containing a non-hygroscopic salt or salts of cobalt and necessitating the use of a writing fluid consisting of a solution of common salt and containing means for transforming non-hygroscopic cobalt salts into hygroscopic ones, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ERNST KRETSCHMANN.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.