

UNITED STATES PATENT OFFICE.

GEORGE H. BALL, OF WATERVLIET, NEW YORK.

METHOD OF COPYING WRITTEN OR PRINTED DOCUMENTS EXECUTED IN CARBONACEOUS INKS.

SPECIFICATION forming part of Letters Patent No. 468,777, dated February 16, 1892.

Application filed May 5, 1890. Serial No. 350,682. (No specimens.)

To all whom it may concern:

Be it known that I, GEORGE H. BALL, of Watervliet, in the county of Albany and State of New York, have invented a new and useful
5 Method of Copying Written or Printed Documents Executed in Carbonaceous Ink; and I do hereby declare the following to be a full, clear, and exact description of the same, that will enable others skilled in the art to which
10 it appertains to make and use the same.

Heretofore it has been considered impossible to produce a copying-press copy of a document executed by the manifolding process, wherein the duplicates are produced by means
15 of paper coated with a preparation of carbon, and the same difficulty has been experienced in obtaining copying-press copies of type-written documents when produced by carbon-coated ribbons.

20 The object of my invention is to provide a method by which manifold copies obtained by means of ordinary carbon-paper and documents type-written by means of carbon-coated ribbons can be reproduced clearly and legibly
25 an indefinite number of times irrespective of the time which may have elapsed after the production of the document to be copied.

To carry my invention into effect the document to be copied should be moistened with
30 a liquid solvent, by which the carbonaceous matter on the document will be impregnated and softened to a sufficient degree to permit a portion of the carbon to become freed from the paper, so that when pressure is applied
35 thereto while the document is still moist a sufficient quantity of the freed carbon will be transferred to the paper on which the copy is to be made, and thereby a clear, legible, and exact copy of the original will be produced.
40 The liquid solvent used in my method is preferably composed of glycerine, acetic acid, and water in substantially the following proportions—viz., two-fifths glycerine, two-fifths water, and one-fifth acetic acid; but the essential ingredient is glycerine, which may be combined with any other suitable substitute for the other ingredients to form an equivalent liquid solvent for this purpose.

In practice the preferable method employed
50 is to moisten the document and the paper on which the impression is to be made with the

liquid solvent. For said paper the oiled tissue-paper commonly used for carbon manifolding is preferable, then placing the copying-paper and the document, fixed face to face
55 between two pieces of blotting-paper, on a sheet of rubber, and then subjecting the whole to pressure to effect a transfer of the carbon matter from the document to the surface of the copying-paper.

When a freshly-executed document is to be copied, the operation above described can be proceeded with at once; but when the document to be copied has been made along time
60 previously a little time should be allowed to permit the solvent to soften the carbonaceous matter before applying the required pressure for obtaining the copy. When the document to be copied is written or printed on both sides with carbonaceous matter, two copies thereof
65 can be made simultaneously by my method by placing the document to be copied between two sheets of oiled tissue-paper, previously moistened with the liquid solvent, placing the same between two pieces of blotting-paper on
70 a sheet of rubber, and then subjecting the whole to pressure sufficient to effect the transfer of the carbon matter to the sheets of copying-paper.

For the purposes of my method I find that
80 a machine in which pressure is applied by means of a roller is most effective; but a modified effect may be obtained by an ordinary copying-press. By this method letters and other documents executed with carbonaceous matter may be copied many times at
85 different periods, each of said copies being reproduced in a perfectly clear and legible manner.

I am aware that "a solution of alkaline earths
90 or certain salts" have heretofore been employed for the purpose of rendering ink transferable in the process of preparing metallic plates for anastatic printing, the plate having been first subjected to the action of hydrochloric acid as a preparatory step to the
95 transference of the matter thereto; but in this earlier method the ink used for executing the document or engraving was required to be possessed of the quality of resisting the action of an acid that was used to eat away the
100 parts of the surface of the plate that was un-

protected by the ink, the parts of the plate protected by the ink being thereby left in relief or raised above the adjacent surface of the plate, so that a coating of ink could be applied to the raised portions for the purpose of obtaining impressions therefrom. I do not claim such a process; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The method herein described for copying documents executed with carbonaceous inks or other carbonaceous matter, the same consisting in first moistening the document with a liquid solution, substantially as herein described, whereby a portion of the carbon on the document will be softened and set free, next fixing the document face to face in contact with copying-paper, and finally subjecting said document and copying paper jointly to pressure, whereby the freed carbon will be transferred from the surface of the document

to the surface of the copying-paper, substantially as herein specified.

2. The method herein described for copying documents executed with carbonaceous inks, the same consisting in first moistening the document in a liquid solution composed of glycerine, water, and acetic acid, substantially as described, whereby a portion of the carbon on the document will be softened and set free, next fixing the document face to face in contact with copying-paper, and finally subjecting said document and copying-paper jointly to pressure, whereby the freed carbon will be transferred from the surface of the document to the surface of the copying-paper, substantially as herein specified.

GEORGE H. BALL.

Witnesses:

WM. H. LOW,
S. B. BREWER.