

UNITED STATES PATENT OFFICE.

GERHARD SCHREIBER, OF CHEMNITZ, SAXONY, GERMANY, ASSIGNOR TO DIE
DIRECTION DER PATENTPAPIERFABRIK ZU PENIG, OF PENIG, SAXONY.

PROCESS OF MANUFACTURING SAFETY-PAPER FOR CHECKS, &c.

SPECIFICATION forming part of Letters Patent No. 322,131, dated July 14, 1885.

Application filed March 18, 1885. (No specimens.)

To all whom it may concern:

Be it known that I, GERHARD SCHREIBER, doctor of philosophy and chemist, a resident of the city of Chemnitz, in the Kingdom of Saxony and German Empire, have invented a certain new and useful Improvement in the Process of Manufacturing Safety-Paper for Checks, &c., of which the following is a specification.

10 This invention relates to the manufacture of paper that shall at once indicate any alteration effected by chemical means of writing or other marks made thereon. The known methods for the production of such safety-
5 paper either do not offer perfect security for the purpose required, on account of the chemical reagents employed therein, or they are of such a complicated nature as not to be practically available.

20 According to the present invention, the purpose aimed at is attained by manufacturing a colored paper of such a nature that the chemicals employed for removing writing or other marks in ink from the same—such as
25 acids, chlorine, &c.—will destroy or alter the color, the paper thus affording the required safety, as any attempt to remove or alter the writing will at once become visible thereon.

The requisite operations for the preparation of such paper are at the same time very simple, and do not affect or complicate the ordinary process of manufacturing paper, as the requisite chemicals need either only be added to the paper material in the rag-engine or the finished paper may be impregnated therewith.

30 The method of practically carrying out the invention is as follows: The prepared paper material is first slightly mordanted with the
40 salt of an iron oxide, (preferably acetate of iron,) and is then intimately mixed in the rag-engine with such a quantity of ferro-cyanide of lead or other insoluble ferro-cyanide (preferably in a freshly-precipitated condition) as will produce the required tint when
45 the paper is treated with an acid. If the paper-pulp be not entirely free from acid, as is generally the case with papers having a resinous size, a blue tint will be produced by

the formation of Prussian blue. This blue tint should be only very slight, in consequence whereof it is expedient to previously neutralize the acid to a great extent by the addition of carbonate of soda or other alkali. If, on the other hand, this blue coloration
55 should not occur, it must be produced up to a certain strength by the addition of sodium ferro-cyanide.

The slightly-blue coloration can be produced by indigo, either formed on the paper
60 fiber itself or used as indigo-carmin, or by tinting either with bluish or reddish hues by means of acid fuchsine. The blue tinting with indigo must not be too strong.

In place of the ferric salt employed for the
65 mordanting, may be substituted, either partially or entirely, an insoluble iron-oxide salt, such as ferric phosphate. In place of ferro-cyanide of lead or other insoluble ferro-cyanide, a soluble ferro-cyanide may be used,
70 in which case the ferric-oxide salt must be a ferric-oxide saccharate.

The paper thus prepared will assume a strong blue color on treating it with acid, Prussian blue being formed. On treating it
75 with chlorine and chloride-of-lime solutions the color will be partly removed by the destruction of the organic coloring-matter, and on treating it with alkalies or alkali cyanides a bleaching or removal of the blue
80 ground color will be effected.

The strength of the blue coloration, on acting upon the finished paper with acids, depends upon the amount of the addition of ferro-cyanide, which can be determined for
85 every case according to the strength of the coloration or the required sensitiveness of the paper.

Instead of adding the above-described substances to the paper material, the desired result may also be obtained by impregnating the finished paper therewith, or with the chemicals that serve to produce those substances applied in proper sequence, although this would involve greater trouble.
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Having thus described my invention, and also the manner of performing it, what I claim, and desire to secure by Letters Patent, is—
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The process of producing safety - paper, wherein the paper material or the finished paper is treated with ferric-oxide salts and with ferro-cyanides insoluble in water but sol-
5 ule in acids—such as ferro-cyanide of lead or the like on the one hand, or ferric-oxide saccharate and ferro-cyanides soluble in water on the other hand—the paper being afterward treated with indigo or acid fuchsine.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GERHARD SCHREIBER.

Witnesses:

ALBERT VIEWES,
OTTO REICHOLD.