

UNITED STATES PATENT OFFICE

FERDINAND EVERS, OF DUSSELDORF, GERMANY.

METHOD OF MAKING PAPER AND SIMILAR MATERIAL PLIABLE.

957,196.

Specification of Letters Patent.

Patented May 10, 1910.

No Drawing.

Application filed September 8, 1909. Serial No. 516,775.

To all whom it may concern:

Be it known that I, FERDINAND EVERS, analytical chemist, a citizen of the German Empire, residing at Stephanienstrasse No. 42, Dusseldorf, in the Province of Rhineland, Prussia, have invented new and useful Improvements in Methods of Making Paper and Similar Material Pliable, of which the following is a specification.

10 This invention relates to an improved method of making paper and similar materials pliable, such as paste board, textile materials, tobacco, cork sheets and thin wooden plates.

15 For the purpose of smoothing papers, textile materials, vegetable matter and other similar materials for a pretty long time past already, glycerin, technical grape sugar and glucose obtained from starch have been employed. Glycerin is unquestionably suitable for that very purpose; it is, however, very expensive. Besides its manufacture, which frequently takes place from rancid or rotten waste-fats, does not qualify it as an article 25 fit for being used in the industries of food-stuffs and table-luxuries.

Grape-sugar or glucose obtained from starch is no suitable means for making paper and other similar materials pliable. When 30 the weather is muggy, the paper prepared by grape-sugar or glucose respectively, attains a certain suppleness indeed; if, however, the weather is dry, or when the paper is stored up in a dry place, it becomes just as hard and rough as if it had not been prepared at all. This drawback is more particularly noticeable in the case of parchment paper which, as is well known, is frequently prepared with grape-sugar.

40 According to the present method, inverted sugar or fruit-sugar respectively is to be used for making paper pliable. The more complete the inversion of the sugar is, that is to say, the smaller is its percentage of unconverted sucrose, the more suitable is it for making paper pliable. The ingredient of the inverted sugar, which possesses the properties necessary for producing suppleness, is the fruit sugar termed levulose, which is exceedingly hygroscopic and, therefore, possesses those qualities on which the suppling operation is principally based. A highly in-

verted inverted sugar has only recently become known and likewise pure levulose or fruit-sugar. The danger now exists with concentrated solutions of inverted sugar, which 55 do not contain sucrose or only a slight portion of it, that dextrose is crystallized out. This, however, can be prevented by the addition of moderate quantities of salts. Those 60 which are best fit for this purpose are the soluble chlorids, sulfates and acetates of ammonium, of the alkalies and alkaline earths, but also slight quantities of glucose obtained from starch and glycerin can be used for 65 avoiding crystallization.

By way of example one form of operation according to the new method is described hereunder:—75 kgs. of inverted sugar are dissolved in 25 kgs. of a hydrated solution 70 of 2.5 kgs. of chlorid of sodium or chlorid of calcium respectively in 22.5 kgs. of water. Or 90 kgs. of levulose (fruit sugar) are admixed to 10 kgs. of glycerin or 95 kgs. of levulose (fruit sugar) to 5 kgs. of glucose 75 obtained from starch. According to the degree of suppleness to be obtained, 10, 25, 50 or 75 kgs. of this solution are taken for 100 kgs. of impregnating liquid, by simply intermixing these quantities with a corresponding quantity of water. Hereupon the 80 objects to be supplied, thus *e. g.* the paste-board, or parchment paper, tobacco-leaves, textile material, thin cork or wood-tables, yarns and other similar materials are saturated with this impregnating liquid, and 85 then these stuffs are allowed to dry in the open air or by means of hot cylinders or calenders respectively. In this way these stuffs are made pliable and prevented from 90 getting moldy with the very same certainty as if they were glycerized.

I claim:—

Method of making paper and similar materials pliable which consists in mixing a 95 hydrated solution of inverted sugar with an ammonium salt, and saturating said material with the mixture thus obtained.

Signed by me at Barmen, Germany, this 28th day of August 1909.

FERDINAND EVERS. [L. s.]

Witnesses:

OTTO KÖNIG,
WILLY KLEIN.