UNITED STATES PATENT OFFICE.

HEINRICH TRENK, OF BERLIN, GERMANY, ASSIGNOR OF TWO-THIRDS TO JEAN BALLATSCHANO AND CONSTANTIN BALLATSCHANO, OF BUCHAREST, ROUMANIA.

PROCESS OF AND COMPOSITION FOR WATERPROOFING LEATHER, &c.

SPECIFICATION forming part of Letters Patent No. 274,059, dated March 13, 1883.

Application filed July 21, 1880. (No specimens.) Patented in England June 11, 1880, No. 2,377; in Belgium June 30, 1880, No. 51,747, and in Luxemburg July 11, 1880, No. 150.

To all whom it may concern:

Be it known that I, HEINRICH TRENK, of Berlin, Prussia, have invented a new and useful Improved Process of and Composition for Waterproofing, Preserving, and Strengthening Leather, Textile Fabrics, Wood, and similar Materials, (for which I have obtained a patent in Great Britain, No. 2,377, bearing date June 11, 1880,) of which the following is a specification.

The object of this invention is to render leather and all kinds of textile fabrics and paper water-proof and durable, and to such end I treat the same with a compound which is prepared as follows: Into a wooden or earthen vessel a quantity of linseed-oil is poured, and with this the fifth part of its volume of sulphuric acid of 66° Baumé is mixed, so that for every five liters of linseed-oil there is one liter of sulphuric acid of 66° Baumé. The sulphuric acid is allowed to act upon the linseed-oil for about thirty minutes, during which the mixture must be diligently stirred until it becomes a thick, blackish mass of greatly-reduced fluidity, which must be disoxidated as follows:

A concentrated solution of sesquicarbonate of ammonia in lukewarm water is gradually added to the above-described mass, stirring it constantly and continuing to do so until it no longer reacts as an acid. When this is the case the vessels and their contents are left to stand twenty-four hours. During this time the contents of the vessel separate into a thick mass and a fluid. This thick mass is the linseed-oil which was decomposed by the sulphuric acid and disoxidated by the sesquicarbonate of ammonia. The fluid is a solution of sulphate of ammonia formed by the disoxidation of the sesquicarbonate of ammonia. The fluid is now drawn off and the thick mass treated as follows to prepare it for use: First, this mass is boiled in a suitable vessel. Then for every five liters of linseed-oil employed four hundred grams of dry glue are soaked in water, and, having been taken out of the water, boiled in a vessel. The boiling linseed-oil mass and the boiling glue are next mixed together, and must continue to boil twenty minutes, being stirred during the whole time. When the mixture has cooled it presents a thick, sticky mass, which serves as the waterproofing mass proper, and which only requires certain additions, according to the nature of the substances treated, as hereinafter described.

To make leather water-proof, the above-described waterproofing mass proper is diluted with linseed-oil, taking to one kilogram of the mass one kilogram of linseed-oil, which mixture must be boiled until the mass is thoroughly dissolved. With this hot solution the tanned hides to be made water-proof must be rubbed by means of cloths till they are fully saturated. The mass should only be applied while still hot, since on cooling it parts with its linseed-oil. It must further be well stirred up each time the rubbing-cloth is dipped into it. The so-treated leather is exposed to the action of warmth until thoroughly penetrated by the solution, and then placed in the following tanning-bath: To forty liters of water add one kilogram of sulphate of chrome-ocher and potash, (chrome-alum,) and when a perfect solution has taken place add one kilogram of pyroligneous acid. The leather remains in this bath about four days, in order to tan the waterproofing substance which has entered into the pores and to make it indissoluble. This takes place in consequence of the glue contained in the waterproofing mass proper, and the so-prepared hides are, after being dried, perfectly water-proof.

In order to render textile fabrics, paper, &c., water-proof, the waterproofing mass proper is mixed with spirit of sal-ammoniac, taking one kilogram of the waterproofing mass to two hundred and fifty grams of the spirit of sal-ammoniac, (aromatic spirits of ammonia,) so that of the latter there is always one-fourth part of the weight of the former. This mixture must be well boiled, and while it is boiling four hundred grams of water are added to dilute it. The solution which results contains therefore, to one kilogram of the waterproofing mass proper, two hundred and fifty grams of the spirits of sal-ammoniac (aromatic spirits of ammonia) and four hundred grams of water. The substances to be rendered waterproof are rubbed on both sides with this mixture; but it is essentially necessary to employ

it hot if a good result is to be obtained. When the substances are dry they are laid for twelve hours in a tanning-bath composed as follows: One kilogram of sulphate of chrome-ocher and potash (chrome-alum) is dissolved in forty liters of water, and to this solution one kilogram of pyroligneous acid is added. The object of this bath is to tan the waterproofing mass by means of the glue which it contains and to make it indissoluble. After lying twelve hours in the bath the substances are removed and dried, and are then finally submitted to the action of the following mixture: To one kilogram of the waterproofing mass proper one kilogram of linseed-oil is added, and both are boiled together until the mass is thoroughly dissolved. The mixture is then, while still hot, rubbed into the substances on both sides till they are fully saturated, after which the substances are dried. It is essential that this last-named mixture should be applied hot, since if allowed to cool it would part with its linseed-oil and the impregnation would be incomplete. The substances thus treated are absolutely water-proof.

Having thus described my invention, what I claim is—

1. The herein-described process of preparing a compound for rendering leather, textile fabrics of all kinds, and paper water-proof, the same consisting in mixing with a quantity of linseed-oil about the fifth part of its volume of sulphuric acid, then disoxidating the same by stirring into it a concentrated solution of sesquicarbonate of ammonia in lukewarm water, then drawing off the fluid, and to the residue mass adding boiling glue, and stirring together and boiling the same, all in about the proportions specified, and in substantially the manner set forth.

2. The process of waterproofing leather, consisting in saturating the tanned hide with the waterproofing compound prepared as herein specified, and then placing the hide in a bath consisting of a solution of water, sulphate of chrome-ocher, potash, (chrome-alum,) and pyroligneous acid, prepared substantially in the manner and in about the proportions set forth.

3. The process of waterproofing paper, textile fabrics, and the like, the same consisting in mixing the hereinbefore described waterproofing compound with spirits of sal-ammoniac, (aromatic spirits of ammonia,) boiling the mixture and diluting it with water, then treating the material to be waterproofed with the compound thus obtained, placing treated material in a bath composed of sulphate of chrome-ocher and potash, (chrome-alum,) water, and pyroligneous acid, and finally subjecting the material to the action of a mixture composed of linseed-oil and the first-described waterproofing compound, specified in claim 1, all substantially in the manner and in about the proportions specified.

HEINRICH TRENK.

Witnesses:

FRANZ SCHULTZE,

BERTHOLD ROI.