

UNITED STATES PATENT OFFICE.

CARL KNOPE, OF HAMBURG, GERMANY.

PROCESS FOR THE PRODUCTION OF WATERPROOF TEXTILE MATERIAL, PAPER, AND THE LIKE.

No Drawing. Application filed April 24, 1925, Serial No. 25,709, and in Germany December 23, 1924.

The invention relates to an improved process and apparatus for the production of water-proof material, paper and the like, by a continuous operation in which the material is successively treated with concentrated solutions of metal chlorides and chlorides of alkaline-earths, lixiviated, washed and dried.

The production of water-proof material, paper and the like by such a process has heretofore been economically and industrially unsatisfactory, owing to disadvantages arising from deterioration or destruction of the cellular tissues of the material, retrogression of the parchmentizing process during lixiviation of the salt solutions employed, and the difficulty of regaining the salt solutions for repeated use.

According to the present invention these disadvantages are overcome, or reduced to such an extent as to ensure commercial success by proceeding as follows: The material to be treated passes, in the course of the continuous operation around heating drums or cylinders previously to reaching the chemical bath necessary for the amyloid formation. After being thoroughly impregnated in the chemical bath and after being scraped and squeezed for removing the superfluous chemicals, the material passes around another heating drum or cylinder and while adhering to the surface thereof undergoes the ripening or maturing process for the amyloid formation. Thereupon the material in order to prevent the retrogression or deterioration of the amyloid formed, passes around a cooling drum or cylinder previously to reaching the lixiviating baths. After being lixiviated in successive stages of the continuous operation, the material is caused to pass, in a zig-zag course, through washing baths and over stands provided with spraying tubes. Finally, after being treated in an impregnating bath for colouring and like purposes if required, the material is submitted to a gradual drying process by being passed around a series of drying drums or cylinders.

The passage of the material to be treated, previously to entering the chemical bath, over heating or drying cylinders produces the essential advantages, that the concentration of the chemical bath is kept constant and that the amyloid formation, which is accelerated by an addition of an oxidizing

agent or oxidizing agents, is not affected by reason of any weakening of the chemical bath.

After the saturated material has been scraped at both sides and squeezed so as to remove the superfluous chemicals, the heating drum or cylinder effects a quick maceration and binding together of the fibrous particles of the saturated material, by transforming a part of them into soluble amyloid, which is rendered insoluble by the action of the cooling drum or cylinder and by the gradual lixiviating, washing and drying process, and envelops and cements together the untransformed fibrous particles.

The improved process may be carried out by apparatus of known kind arranged to effect the respective stages of the complete operation continuously and successively in the desired sequence; a detailed description of any particular form of apparatus is therefore deemed to be unnecessary. It may be mentioned, however, that in the preferred arrangement the apparatus is adapted to deal with the material in the form of webs and comprises the following elements, viz: Heating drums or cylinders around which the web material passes from the web rolls; a chemical bath and guide rollers leading the web therethrough from the heating drums; scrapers adapted to act on both sides of the material as it leaves the chemical bath; squeezing rollers acting on the web after it has been scraped; a heating drum or cylinder and a roller adapted to press the web against said heating cylinder; a cooling drum; a plurality of lixiviating baths and squeezing rollers acting on the web as it leaves each bath; a plurality of washing baths and sets of spraying tubes adapted to spray both sides of the web, and squeezing rollers acting on the web after it has passed each washing bath, and a series of heating drums for finally drying the web.

The improved process and the arrangement of the plant as described have proved a complete success in practical use. The efficiency will be apparent, without further explanation, from the statement that webs of 15 to 1,000 grammes weight per square metre can be successfully treated by the process according to the invention, whereas with the hitherto customary methods webs below 35 and above 250 grammes weight per square

metre were excluded from being successfully treated.

It will be understood that the arrangement of apparatus outlined above, for dealing
5 with material in web form, is referred to merely as an example, and that, if desired, the application of the process to material in sheet form may be readily arranged for by providing suitable devices such as endless
10 bands, for guiding the sheets throughout the apparatus.

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

15 Process of parchmentizing paper and like material by a continuous operation, com-

prising the following successive procedures, the material to be parchmentized is artificially dried, immediately thereafter it is treated in a bath containing amyloid-forming salts, after leaving the chemical bath
20 is is scraped at both sides, squeezed between pressure rollers and heated to mature the amyloid formed by the chemical treatment, subsequently it is cooled sufficiently to prevent retrogression or deterioration of the
25 amyloid formed, and finally it is lixiviated, washed and dried.

In witness whereof I have hereunto signed my name this 31st day of March, 1925.

CARL KNOFF.