Patented Apr. 8, 1930 1,753,565

UNITED STATES PATENT OFFICE

FRITZ FRANK, OF BERLIN, GERMANY

PROCESS FOR COATING PAPER-PULP VESSELS FOR THE PROTECTION THEREOF AGAINST THE ACTION OF MOISTURE, FAT, SOAP, AND THE LIKE

No Drawing. Application filed October 26, 1925, Serial No. 65,043, and in Germany October 27, 1924.

It is known that a protecting film can be produced on or in pasteboard vessels or on plates of such materials by applying sizing materials, casein or the like, and hardening them. The coatings thus produced are not, however, in the case of paper pulp having either a rough or a smooth surface, intimately connected therewith.

It has now been discovered that this difficulty can be removed completely and in a manner that was not to be expected, if the pasteboard and paper vessels or plates or the like, irrespectively of whether they are sized or unsized, are first moistened with a thin solution of a substance having an alkaline reaction, such as ammonia. These substances cause a loosening of the fibres of the material. Now if the sizing liquor, which generally consists of aqueous steepings of size, gelatine, casein, mucilage or the like, is applied, this material penetrates into the softened alkali treated material and anchors itself, so to speak, in the paper pulp itself. In this method of working, therefore, not only a coating, but a certain depth action is produced, which might be described as impregnation.

An almost identical technical effect is obtained if the substance having an alkaline reaction, ammonia for example, is added to the sizing liquor or the like.

In this method of working the formation of insoluble or difficultly soluble salts may be effected simultaneously with the binding of the layer of size or the like in and upon the paper pulp material. By this means the value of the protecting material is considerably increased. As such insoluble deposits or difficultly soluble salts the most varied kinds of compounds may be employed. Sulphates, phosphates, fluorides of earths, metallic salts, sulphides, oxides and equivalent compounds may be mentioned. If for example a soluble barium salt is being applied along with the aqueous solution of the substance having an alkaline reaction, the dissolved salt that has penetrated into the fibrous material can be converted, by means of sulphuric acid for example, which is applied with the sizing liquor or the like, in the fibre and at the point of contact of the fibre and the covering layer, into an insoluble sulphate. Water soluble sulphates or fluorine compounds or fluosilicates or the like act even more simply than acids.

The deposition of salts also has the further advantage of protecting the materials against decomposition by external influences, such as microorganisms. This protection is however even better effected by the addition of direct protecting media, which at the same time exert a hardening action upon the covering layers (size, gelatine, casein, mucilage and so forth) without special further treatments being required. If, for example, formaldehyde or similarly acting materials are added, or, better, substances which evolve such aldehydes or contain them in an unstable form, the latter produce their full effect in these methods or working. Such aldehyde evolving substances are paraformaldehyde and hexamethylenetetramine. In this way fluorine compounds for example also act, but their conversion into insoluble protecting bodies, as has been described above, should not then be brought about.

What I claim is:

1. A process for the production of coatings on glazed and unglazed paper pulp and papier-mâché, consisting in moistening said paper material with an aqueous solution of a substance having an alkaline reaction in which salts capable of being precipitated are dissolved and applying a coating of sizing liquor containing a medium capable of precipitating said salts.

2. A process for the production of coatings on glazed and unglazed paper pulp and papier-mâché, consisting in moistening said paper material with an aqueous solution of ammonia in which salts capable of being precipitated are dissolved and applying a coating of sizing liquor containing a medium capable of precipitating said salts.

3. A process for the production of coatings on glazed and unglazed paper pulp and papier-mâché, consisting in moistening said paper material with an aqueous solution of a substance having an alkaline reaction in which barium salts are dissolved and apply-

ing a coating of sizing liquor containing a medium capable of precipitating said salts.

4. A process for the production of coatings on glazed and unglazed paper pulp and papier-mâché, consisting in moistening said paper material with an aqueous solution of ammonia in which barium salts are dissolved and applying a coating of sizing liquor containing a medium capable of precipitating said salts.

In testimony whereof I have signed my name to this specification.

PROFESSOR DR. FRITZ FRANK.