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PROCESS FOR MANUFACTURING WATERPROOF TEXTILES, PAPERS, CARDBOARDS, AND PASTEBOARDS AND FINISHED CONTAINERS MADE FROM THOSE

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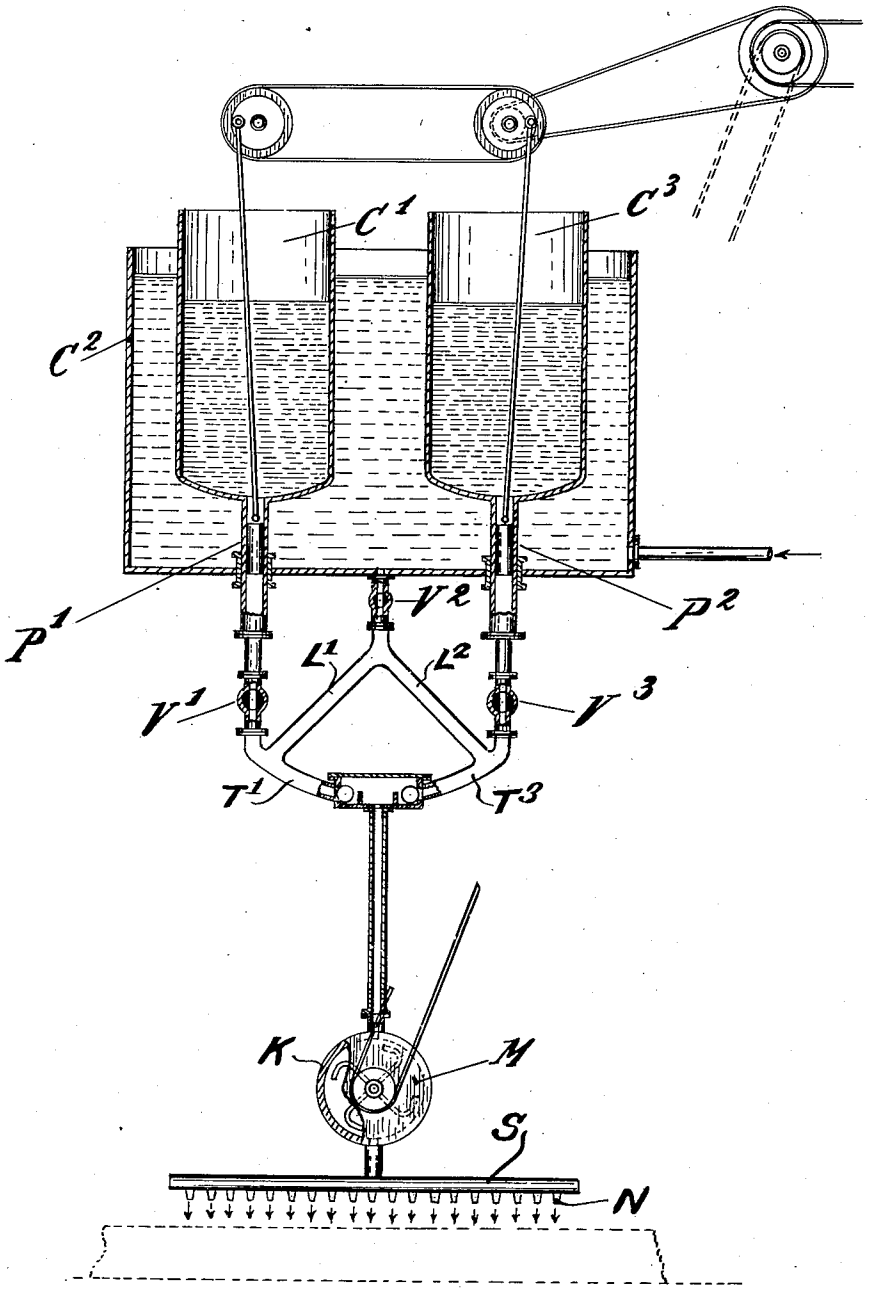

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PROCESS FOR MANUFACTURING WATERPROOF TEXTILES, PAPERS, CARDBOARDS, AND PASTEBOARDS AND FINISHED CONTAINERS MADE FROM THOSE

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2 Claims. (Cl. 91—68)

This invention relates to the manufacture of paper or boards or textiles, and particularly to a new process for waterproofing.

It is known that for making waterproof textiles, papers, cardboards and pasteboards, these are dipped into a bath of animal glue and after this into a glue-hardening bath, for instance, aqueous tannic solution, chromic compounds, formaldehyde, etc.

By hardening the glue solution, which has been applied on paper, board, textiles etc., after the treatment with glue, as just described, a hardening of the glue takes place only on the surface, but not in the interior of the glue.

The hardening of the glue would be more thorough and more complete, if one would succeed in adding the glue hardening means to the animal glue, or to the gelatine. This can be done successfully, if only a small amount of hardening chemicals is added to the glue. At a greater addition of the above-mentioned glue-hardening means the mixture gelatinizes, and there results a mass which is neither soluble in hot nor in cold water, in which the glue-hardening process has taken place too early.

There are known, however, animal glues which in spite of the addition of glue-hardening materials remain in liquid condition a short time which, however, also here are not treated with a sufficient amount of glue-hardening means.

In the employment of high valued animal glues the time of gelatinizing is especially short, and it is in spite of all treatments, as, for instance, the addition of a protecting colloid, not possible to pull a paper, textile, cardboard or pasteboard through such a bath without having the glue solution with the glue-hardening addition not gelatinize in the shortest time, even if the dimensions of the dipping bath are made as small as possible, and if the addition of both ingredients has been done separately.

The new improvement of the invention does not consist in the use of a bath for the impregnation of the textiles, papers, cardboards and pasteboards, but a spraying arrangement, in which the combined solutions of the animal glue with a rich addition of glue-hardening means are brought quickly on the materials to be impregnated.

This mode of impregnations has the further advantage of making possible the treatment by a spray of finished objects of papers, cardboards or pasteboards, so that the edges, for instance, of boxes of board are filled with sufficient glue material, so that water, neither from the interior nor from the outside, can penetrate the boxes. This spraying process also represents a method for waterproof pasting.

Of special value are, for instance, such boxes or beakers of galvanic elements, the duration of life of which is mostly dependent upon the prevention of the evaporation of the electrolytic liquid, and also the prevention of a short circuit caused by the entry of water or moisture from the outside.

Of special value also are, for instance, larger boxes and containers from cardboard or pasteboard which are used for the packing of sensitive wares, where on the one hand protection against water and moisture is desired and on the other hand a sealing of the interior against the entry of insects is sought, as is the case in the tropics.

The process does not need to be executed with one spraying machine, but several sprayers in series can be used, in order to obtain a uniform impregnation the effect of which resembles that obtained by the use of a dipping bath. The impregnation can be executed on one side, or on both surfaces of, for instance, textiles, papers, cardboards and pasteboards. On account of the uniformity desired in this case, the papers, textiles, cardboards or pasteboards pass two rubber rolls which are under a certain pressure.

By this arrangement one obtains the full saturation of the animal glue with the glue-hardening means without the effect of a too early gelatinizing. By this arrangement the coating of the glue is impregnated through and through with the glue-hardening means and not only on the surface of the materials which are coated, so that the materials impregnated in this manner are waterproof to a very much higher degree than was the case heretofore, and such papers are fully greaseproof.

In order to attain the above described effects, a spraying arrangement is employed which is installed with the following features. As known, the spraying machines are driven with compressed air, and the liquid to be sprayed is added with a hose or with a pipe. In this special arrangement, above or at another suitable place of the spraying pipe, there is a small mixing container which is furnished with two hoses or pipes which direct to it the warm glue solution and at the same time also the glue hardening liquid. These are fed from reserve tanks at higher levels, and their contents are kept always at the most favorable temperature. Besides the two containers with glue and glue-

hardening means in solution there are two containers with hot water which by means of two two-way-cocks can be opened, so that instead of the glue and glue-hardening means in aqueous solution which in normal operation pass through the two-way-cocks, hot water runs through this spraying arrangement in order to free the machine instantly from the glue and glue-hardening mixture. If the machine is not cleansed instantly of the mixture of glue and glue-hardened means after the finishing of the work or at an involuntary stop in the machine operation, the machine is blocked with the hardened glue in such a degree that it can hardly be used again without exchanging essential parts.

This arrangement is to be installed at a series of spraying pipes, in order to thoroughly clean at the same time all spraying apparatus.

The invention is illustrated by the embodiment explained hereinafter in conjunction with a sectional view of the apparatus, with certain parts shown in elevation, in the accompanying drawing.

As an executing example one uses one or a series of separately installed spraying pipes S into nozzles N, which are driven with compressed air. Above of the spraying pipe a small mixing container M is installed which has a stirring arrangement K operating therein. This small mixing container M is fed from two pipes or hoses T′ and T^3 with a glue solution of 30%, and with a formaldehyde solution which contains so much formaldehyde considered as 100% that 1–2% are calculated on the full mixture, or such an amount that a complete hardening of the animal glue is reached after the drying. Of the two solutions there results a solution of glue of 15%. The glue solution of 30% and the formaldehyde solution are contained in two separate, heatable reserve containers, C′ and C^3, the temperature of which does not exceed 50° C. Two-way cocks or valve V^1 and V^3 in pipes T^1 and T^3, respectively, control the passage of the glue and the glue-hardening solution to the mixing chamber M.

In addition to these containers with the chemicals, the hoses and pipes with the glue and formaldehyde solution are combined by means of the two-way-cocks V^1 and V^3 with a container C^2 filled with hot water. At a suspension of operations, hot water at a certain pressure is conducted in another way through two-way cock V^2 and tubes L^1 and L^2 through pipes, hoses, container and spraying arrangement, in order to clean all parts from glue and the glue-hardening means.

In place of the formaldehyde solution an aqueous solution of potassium bichromate, a chromic acid solution, a chromic alum solution can be employed with the advantage of being odorless.

With the aid of the above described arrangement, textile material, paper, cardboard or pasteboard in sheets of predetermined length or in endless run can be impregnated with the aid of a series of spraying pipes. In other cases only single objects, as boxes, containers, finished boxes, etc., can be made waterproof by such an impregnation. In order to make such boxes waterproof for oversea-transport such a spraying apparatus is used.

A textile material, paper, cardboard or pasteboard is, for instance, impregnated with such a glue solution of 10 or 15% with the above described glue-hardening substance on one side or on both sides, and in order to obtain a homogeneous surface in the paper as well as on the paper the run passes a rubber roll press.

A further special example is the installment of such a spraying arrangement directly on the paper machine at such a place between the drying cylinders, where the paper or board run has already such a strength and dryness that it stands the blowing by means of spraying pipes and passing through two press rolls without breaking off. This can be done easily on a pasteboard machine and on those machines on which heavy papers are worked. After this impregnation on the paper or pasteboard machine, the run first must pass a kind of cylinders on wooden sticks in order to dry without sticking on the cylinders; the last cylinders are again normal drying cylinders. As the impregnation imparts a hard brittle, strong finish to the textile, paper, cardboard or pasteboard, care must be taken for applying a softening bath, to which a solution of a suitable grape-sugar or glycerin is advantageously added.

For making such paper soft and pliable it is treated either with grape sugar or glycerine or with a mixture of both, the paper can be treated with these softeners either before the spraying treatment or when the paper is finished which means after having passed the drying cylinders.

What I claim is:

1. The method of coating articles with a concentrated glue solution comprising mixing the glue with a glue hardening agent only to form a glue composition by vigorously agitating said glue and glue hardening agent, and immediately coating the articles with the glue composition.

2. The method of coating articles with a concentrated animal glue solution comprising mixing the glue with a glue hardening agent only to form a glue composition by vigorously agitating said glue and glue hardening agent, and immediately spraying said glue composition upon the articles to be coated.

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