

ALIEN PROPERTY CUSTODIAN

PROCESS FOR PRODUCING AN AGENT ADAPTED FOR RENDERING MATERIALS IMPERMEABLE

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vested in the Alien Property Custodian

Application filed September 27, 1938

It is known that by the action of aldehyde, for example an aqueous solution of aldehyde, glue is hardened and can be employed for the coating or for the impregnation of containers of paper, pulp, textiles, wood veneer and the like. In this way containers can be obtained which are impermeable with respect to oils and fats of animal, vegetable and mineral origin as well as against aliphatic and aromatic hydrocarbons, for example petroleum, benzine, benzol and the like.

The coatings or impregnations obtained in this manner have however the disadvantage that they are brittle and that they do not remain flexible or creasable. The containers are readily cracked or blistered by shock or pressure and in this way lose their fluid tightness and leak.

It has been found that the hardened coatings consisting of skin glue, bone glue, gelatine, can be given certain good and useful properties and at the same time the above mentioned disadvantages overcome, if mixtures are made which consist of glue and rubber together, and these mixtures utilised as substances for rendering materials impermeable. Rubber solutions of all kinds have been found suitable for this purpose, in particular natural and artificial rubber latices and further dissolved dried rubber latices, other rubber solutions and also artificial materials of rubber-like properties, in particular those embodying vinyl polymers.

A difficulty in the production of such mixtures comprised of hardened glue and rubber latex or aqueous dispersions of artificial materials is found in the fact that rubber latex and the other dispersions are very sensitive towards heat and also on admixture with other materials very readily coagulate and separate, whereby the mixture is rendered unusable. In order to avoid these disadvantages the glue must be first so treated that it is cold soluble. Also on addition of the hardening materials to the solution of the cold soluble glue and the admixture with the rubber dispersion great care must be taken.

The liquid material composed in the stated manner may be readily applied as coatings by hand or by machine and gives products which after subsequent drying on paper, pulp, textiles, wood veneers and so forth, gives films resistant against and impermeable to oils of any kind, petroleum, benzine, benzol, chemical compounds such as thio-ethers and such like organic sulphur compounds their solutions in benzol and the like and, which may be used in the stated manner to treat endless webs of paper, pulp, textile and so forth, from which container sections can

be stamped out. The individual parts stamped out, namely walls, bottoms, covers and so forth can be glued together by the use of the material according to the invention in such manner as to be impermeable to oil, petroleum and benzol.

A particularly surprising property of the material according to the invention is to be found in the fact that, in spite of its content of rubber or its substitutes, the quantity of which corresponds to the quantity of glue present, it is insensitive towards oils, fats and solvents consisting of hydrocarbons whereas rubber is immediately dissolved or destroyed thereby.

A mixture having the desired properties consisting of glue with rubber or rubber substitutes in solution from which raw materials and containers impermeable to oils, fats, benzol, benzine, and so forth can be obtained, can be prepared, for example, in the following manner.

Skin glue is allowed to swell for a few hours in water and an aqueous solution of nitrogen base (amine and/or ammonia), for example ammonia, until the glue is saturated with the aqueous solution and has attained its most swollen condition. The container during this is continuously closed. The glue is then transferred to a water bath and warmed gently until completely dissolved. This is effected at a relatively low temperature of below 30° C. A formaldehyde solution is then added to the ammoniacal glue solution with stirring. As the result of the chemical reaction of the mixture a considerable heating results.

The solution of the glue can, at least in part, also be so effected that it is first warmed with addition of water or without any water addition on the water bath and the aqueous solution of the nitrogen base, or the nitrogen base and the water subsequently added. Aldehyde is then introduced.

The glue is cooled down with continual stirring in order that it shall not gelatinise prematurely at the walls.

In another container, for example 150 parts of a purified rubber latex freed from its unsuitable constituents by centrifuging and simultaneous washing with ammoniacal water, and having 80% rubber content is diluted by mixing with 100 parts of water.

This aqueous rubber latex which is stabilised with a small proportion of ammonia is brought as far as possible to the same temperature as the glue solution. The temperature of both the parts to be admixed lies preferably below 50° C., since the rubber solution is sensitive towards higher

temperatures and at higher heats undesired evaporation losses can occur. Preferably the temperature of both mixtures lies between 20 and 30°C. Temperature differences of about 2 to 3°C. are without influence upon their satisfactory combination. Higher differences act unsatisfactorily by giving a greater tendency to the rubber dispersions to coagulation.

The glue solution and the rubber latex which are both adjusted for example to 24°C. are combined with one another with continual stirring and form the product according to the invention for rendering materials impermeable. In order to avoid coagulation, it is recommended to add the gluc solution to the rubber latex.

The product according to the invention may have, for example, the following composition:

20 parts of water
 25 parts of an aqueous 25% ammonia solution
 10 parts of skin glue
 30 parts of an aqueous 30% formaldehyde
 15 parts of a 60% latex concentrate freed from its hygroscopic and unsuitable constituents by centrifuging and simultaneous washing with ammoniacal water.

According to the desired properties and purposes of use of the product, the proportions of the constituents can be altered. If the ammonia addition is increased above the content of formaldehyde then there is obtained a lower viscosity of the product but at the same time, however, a reduced hardening. The film then obtained for example on paper is less resistant and impermeable to petroleum, oil and so forth. If the content of formaldehyde is increased over the content of ammonia, then there is obtained a higher viscosity of the product combined with a relatively better impermeability of the film obtained therefrom against oil, petroleum, benzol and so forth.

The product can be kept in closed vessels and the like for several weeks without the films obtained therefrom varying essentially in their resistance. A longer storability can be obtained, however, if one or a few days after the production a further proportion of the aldehyde employed is introduced in aqueous solution with stirring, for example, 15%. In the interim, the intramolecular conversion has so far proceeded that the mixture is ready to receive a further

proportion of formaldehyde without being unfavourably influenced.

The product obtained in the described manner remains liquid down to a temperature of about 21°C. and gelatinises at about 18°C. and below. According to the composition, the gelatinisation temperature can however lie considerably lower. By careful slow warming to about 24 to 25°C. the solid mass can again be rendered liquid. On reliquefaction a higher viscosity is obtained at lower ranges of temperature, for example 23 to 24°C. and a corresponding lower viscosity at a somewhat higher range of temperature, for example 28 to 30°C. In this condition the product is outstandingly suitable for application by brushes, rolls, spraying devices and the like to paper, pulp, textiles and veneers both in the form of sheets and also in endless webs and further to objects such as walls and the like for the coating (for example dipping) of containers of materials of all kinds for the production from textiles or other materials of coverings resistant and impermeable to oil and petroleum for oil conduits, bags and so forth.

By simple coating (dipping) with the product, for example paper containers even up to the size of barrels can be rendered suitable for the handling and shipping of oils, fats, petroleum, benzine, benzol, oil colours and so forth.

Instead of skin glue or bone glue use may also be made, with the same results, of cold soluble adhesive albumen materials obtained from albumen, casein or vegetable albumens, for example soya casein, by treatment with ammonia. These adhesive materials are in each case treated with formaldehyde as hardening agent and with an aqueous dispersion of rubber or rubber-like artificial materials for example vinyl condensation products or polyvinyl compounds. For increasing the storability and handleability prior to the production of the coating and impregnation, it is also advantageous with products obtained from these glue materials to add a further quantity of aldehyde a few days after the combination of the glue material with the rubber dispersion.

As soon as the product is applied and the coating and impregnation dried it is of great permanence.

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