

# ALIEN PROPERTY CUSTODIAN

## PROCESS FOR VARNISHING SUPPORTS MAINLY COMPRISING RUBBER

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The invention relates to the superficial varnishing of supports made wholly or partially of rubber, more particularly of coatings which chiefly contain rubber, either in the ground and macerated state, or in the state of rubber latex, mixed, or not, with dyes and/or other additions or fillers, said coatings being laid on cloth or other foundations. The invention may, furthermore, be applied to rubber articles.

The object of the invention is, on the one hand to enable a homogeneous and permanent binding to be obtained between the varnish and the support mainly comprising rubber (hereinafter named "rubber substratum") by means of an interposed binder, and also, on the other hand to ensure the preservation of the rubber substratum, of the varnish and also of the binder, by so choosing the composition of said binder and chiefly the method of using same, as to produce finally the stabilization of the elements present and prevent any alteration in time, either owing to their mutual action, or by the effect of their natural ageing or ripening.

For this purpose, the invention has for its object a chemical process which is characterized by the fact that a composition is prepared, at the instant when it is to be used, which is formed by adding to a mixture comprising oils and natural and/or synthetic resins or gums, a conversion agent which contains a sulphur derivative and is intended to perform the dual function of a vehicle for the sulphur for vulcanizing purposes and of a polymerizer for the mixture of oils and resins, so as to cause by reaction the formation of a kind of artificial rubber which changes successively and progressively from the liquid state to the gelatinous state, and then to the solid state, said composition being applied, when liquid, on the rubber substratum.

In practice, the basic mixture of the binder intended to act as an intermediary between the rubber substratum and the varnish (which may be of any kind: fatty varnish drying in the cold or in the hot state, varnish made with oil, with natural or synthetic gums or resins, or with cellulose esters) is composed: of drying oils, or semi-drying or non-drying oils; of slightly volatile supplying agents or solvents or of volatile solvents; of natural and/or synthetic gums or resins and also, optionally, of cellulose esters, particularly in the case in which said binder has to form, of its own accord, the covering varnish.

These products are mixed either in the cold or in the hot state, in order to obtain, in the latter case, by an appropriate fusion, a homogeneous

mixture and a quicker and more perfect solution in the hot state, in the oils, of the various resins used. On the other hand the final varnish may advantageously contain a certain proportion of the heavy or light solvents and also of the supplying agents contained in the binder.

Furthermore, a solution of a halogen compound of sulphur is simultaneously prepared, preferably of sulphur chloride, in a solvent such as a benzol product, for example. Said solution is kept apart and is only introduced into the basic mixture at the instant when same is to be used.

In order to carry out the invention, it is possible for example to operate as follows:

Assuming that the foundation is formed by a cloth, the same is coated with a mixture of macerated rubber or with latex filled with dyes and with fillers in which have been previously introduced vulcanizing agents, accelerators and anti-oxidants or anti-ageing agents.

When the rubber substratum has reached a sufficient thickness and the light solvents or the aqueous solvents have been eliminated by drying, preparation is made for covering the rubber substratum with one or a plurality of thin layers of binder. For this purpose, into a previously dissolved mixture containing, by way of an exemplary formula, the following constituents, in the proportions expressed hereinafter in parts by weight:

Linseed oil.....	100
China-wood oil.....	25
Castor oil or supplying agents such as phthalates, lactates, tricresylphosphates and homologues.....	250
Natural resin.....	15 to 20
Synthetic resin (Albertol for example).....	15 to 20

of the solution of which is facilitated by fusing to 180-240° C., according to the gums or resins, are introduced, at the instant when it is to be used (and this method of operation forms a particularly important feature of the invention):

10% of a 10% benzol solution of commercial sulphur chloride, said solution being kept apart ready for use. The sulphur chloride may be replaced by any other halogen compound of sulphur which is capable of performing the dual function of a vulcanizing agent and of an agent for converting the mixture of oils and resins into artificial rubber.

A slightly exothermic reaction takes place between the mixture of oils and resins and the sulphur chloride, which leads to the formation

of a kind of "artificial rubber" or "oils rubber", that is to say a chlorinated and semi-vulcanized compound which progressively changes from the liquid state to a gelatinous state, and then to a solid state.

Said reaction, which is due to said converting agent, takes place in the space of about twenty minutes; this is why the application has to be effected quickly, while the mixture is liquid. This time is moreover reduced by the partial elimination of the benzol during the drying; and when it has passed, a thin pellicle or film is thus deposited on the rubber substratum. Simultaneously, the benzol which dilutes the sulphur chloride, penetrates into the rubber substratum and carries with it therein a slight quantity of oils and also of sulphur chloride, thereby making the rubber permeable and swelling same, thus performing the "binding" function and completes its vulcanization, in spite of the relatively low temperatures (30° to 60° C.).

After said film of "binder" has become sufficiently dry, the final finishing varnish is applied by a classical process, such as spreading or spraying. Said varnish may be a varnish mainly comprising cellulose or mainly comprising synthetic or natural gums or resins, or cellulose esters. Its drying is effected either by the quick method or by the slow method.

As the vulcanization of the rubber continues for several hours or several days, the embossing and the printing of the whole arrangement can be effected without difficulty. During this time, a kind of ripening takes place as is usual when rubber is used, and also when varnishes are used, since there is always the drying phase which permits of manipulating the goods without deteriorating them, then the ripening or ageing phase which is well known in all rubber industries and also in the paint and varnish industries, at the end of which phase the outer surface assumes its final appearance and hardness.

An interpenetration gradually takes place of

the various constituents of the products which are present either in the rubber substratum, or in the "binder", or in the varnish; this produces a perfect homogeneity which makes it impossible to separate the superposed pellicles or films. But said interpenetration becomes stabilized at a certain final phase, owing to the fact that the intermediate film becomes converted into an artificial rubber which becomes stronger and stronger while remaining flexible. This film of artificial rubber becomes insoluble in the solvents which surround it and so prevents a continuation and an increase of said interpenetration, the final result of which could only be the destruction of both the rubber and the outer varnish.

In fact, in the other varnishing processes which do not use any binder or which do not use a binder obtained by the methods and the formulae which are the object of this invention, the ageing of the rubber is accelerated by the penetration of foreign products such as oily products. The rubber becomes sticky or powdered and the article is destroyed. The same applies to the varnish which dries up and becomes opaque or breaks under the slightest pressure.

It is of course obvious that the film of binder according to the invention may be of such composition that it forms of its own accord the coating varnish, in particular if it contains a sufficient proportion of resins, gums or cellulose esters, together or separately. This result may be obtained by doubling, for example, the quantities of resins indicated in the above formula. It is also possible to add to the constituents provided in said formula 100 parts of a cellulose ester, for example nitrocellulose, supplied with supplying agents which are homologues of those of the "binder", such as castor oil, and are supplied in the shape of collodion by means of solvents and diluting agents such as ethyl acetates, alcohols, benzol products.

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