

UNITED STATES PATENT OFFICE

2,025,486

IMPREGNATING MATERIAL

Benjamin J. Victor, Oak Park, Ill., assignor to
Victor Manufacturing & Gasket Company, Chi-
cago, Ill., a corporation of Illinois

No Drawing. Application July 18, 1933,
Serial No. 680,992

3 Claims. (Cl. 91—68)

This invention relates to an improved impreg-
nating material, and has for one of its principal
objects the provision of an impregnator for tex-
tile material and the like, which shall render the
same waterproof and also proof against the ac-
tion of various other liquids, particularly petro-
leum products.

One of the important objects of this invention
is the provision of a textile impregnator which,
in addition to rendering a textile material or the
like proof against attack by various liquids, shall
at the same time leave the same in condition for
suitable working and for the ordinary applica-
tions to which said textile material has previously
been put.

A further important object of the invention is
to provide an impregnating compound for certain
textile materials or the like, as, for example, as-
bestos, which impregnator, in addition to render-
ing the asbestos waterproof, shall also make the
same proof against the attacks of liquid hydro-
carbons, and in conjunction with the fireproof
properties of the asbestos itself, shall also aid
in preventing decomposition under extreme heat.

Another and still further important object of
the invention resides in the provision of a com-
pound particularly adapted for use in making
gaskets for internal combustion engines, which
gaskets include an asbestos filler or sheet, and
which asbestos, when impregnated with the ma-
terial of this invention, shall be rendered water-
proof and also proof against the action of gaso-
line or the like, in addition to being made ex-
tremely tough and compact while at the same
time retaining its desirable resilient qualities.

Other and further important objects of the in-
vention will be apparent from the disclosures in
the following specification.

The invention, in a preferred form, is herein-
after more fully described.

The improved composition of this invention
may be prepared, and the textile material or as-
bestos may be impregnated to render the same
water and gasoline proof in any one of a number
of related methods and with certain variations
in the materials used.

One of the preferred embodiments of the in-
vention is the incorporation of aluminum stear-
ate into the textile material, asbestos or the like
for impregnating purposes to render the same
proof against the action of water and other ma-
terials.

In order to conveniently employ the aluminum
stearate, it is dissolved in a suitable solvent such
as, for example, carbon tetrachloride or a similar

material. Mixtures of carbon tetrachloride with
other liquids or solvents, as, for example, benzol,
may also be employed. The solution is usually
facilitated by the addition of heat, and it has been
found that the use of a temperature of around
140° F. is quite satisfactory when carbon tetra-
chloride alone is employed for the dissolving of
the aluminum stearate.

The proportions used can be varied consid-
erably, depending upon the desired viscosity of the
resulting solution, one part by weight or volume
of aluminum stearate to five parts by weight or
volume of carbon tetrachloride having been
found to be quite feasible. Care must be taken
in dissolving the stearate in the liquid in order to
prevent air bubbles from forming.

After complete solution has taken place, the
material can be reduced, if desired, with a suit-
able thinner so as to provide for a more ready
impregnation. This thinner may comprise an
addition of the original or a different solvent.
The solution can thereby be brought to any de-
sired point of viscosity, so that the same will read-
ily penetrate a sheet of textile material or a sheet
of asbestos fibers, hemp or jute fibers, or any
other textile or similar material which it is de-
sired to impregnate by the improved composition
of this invention.

To improve the solution so as to render the im-
pregnable material more flexible, 1 to 5% of a
free fatty acid material may be added. This is
thoroughly mixed, and it has been found that as-
bestos or similar material will thus become im-
pregnated quite thoroughly and to such an ex-
tent that the same is rendered completely water-
proof and also proof against the action of liquid
hydrocarbons such as gasoline, which is quite de-
sirable when the asbestos is used in the manu-
facture of gaskets for internal combustion en-
gines.

The material can then be dried, preferably
without the application of heat and under merely
a forced draft of air, the omission of heat being
particularly important when the free fatty acid
has been added to the solution.

The carbon tetrachloride vapors carried off in
the drying process may be reclaimed.

Another impregnating compound is prepared
by partially decomposing the aluminum stearate
or similar material, this being preferably done at
a temperature of around 400° F. and over a sul-
phuric acid bath, the vapors of the acid acting
upon the impurities formed by the aluminum
stearate while decomposing. This process also

acts in a great degree to prevent the possibilities of undesirable foaming and bubbling over.

After the aluminum stearate has been totally dissolved, it assumes a gummy consistency, and if allowed to cool to room temperature, will resemble to a great degree and will take on many of the characteristics of an artificial resin, and in this condition, is completely soluble in benzol or a similar solvent.

- 10 In order to reduce the dangers inherent to the use of the inflammable benzol, a considerable amount of carbon tetrachloride or some other noninflammable solvent may be added to the benzol, and the decomposed aluminum stearate, when taken up in solution, may then be further thinned and used for impregnating purposes in substantially the same manner as the dissolved powdered aluminum stearate described above. After the desired saturation of the asbestos or other textile material has been accomplished, the benzol, carbon tetrachloride or other solvents may be accordingly reclaimed.

- 25 The use of the above process results in an impregnating material which, when applied to asbestos or the like, thoroughly penetrates the fibers thereof, and after the solvent has been evaporated off, the aluminum stearate has become so thoroughly incorporated into the fabric or fibers that an absolutely waterproof material results, and one which is also peculiarly resistant to the actions of other liquids, notably hydrocarbons. It is this property which renders the impregnated asbestos particularly valuable for gasket purposes. The material is accordingly toughened and rendered considerably more flexible, and the tendency of the fibers to separate is practically eliminated, while at the same time the desired flexibility and workability is retained.

- 40 Another embodiment of the invention is the use of turpentine oil as a solvent for the aluminum stearate. Six parts of turpentine oil will dissolve one part of aluminum stearate with gentle heating, and after cooling, the solution will set to a jelly which can be diluted by adding more solvent. An addition of ethyl alcohol to the latter will impart considerably greater liquidity.

- 50 The turpentine oil may also be used to further dissolve the jells obtained with carbon tetrachloride and benzol. The use of turpentine with the carbon tetrachloride will probably be preferable on account of the lessened fire hazard.

- 55 Another modification of the invention is the actual forming of an aluminum stearate or an aluminum soap within the fiber through the interaction of soap and aluminum sulphate. This also produces a very good and satisfactory gasket material. Iron may also be substituted for aluminum and iron oleate for stearate.

- 60 The latter is preferably pre-treated with a two per cent copperas solution, and after drying, saturated with a casein glue solution containing two per cent ammoniam oleate, and again dipped into

the copperas solution, thereby forming two films of a metallic oleate which envelop the casein glue layer on both sides.

While aluminum stearate is the preferred saturant, other metallic salts of fatty acids may be employed, such as oleates or combinations of stearates and oleates may be used. This particular saturant is sufficiently clear and can be made of a desired viscosity so as to penetrate and act as a proofing material for various textiles and fibrous materials other than asbestos, such as hemp and jute fibers. By saturating hemp and jute fibers, a new vegetable fiber packing for shafts is available which has both gasoline and waterproof qualities. One of the main objections to a rope vegetable fiber packing and the saturants heretofore employed therewith is that a corrosion or caustic action takes place when used between two magnesium metals. The use of the saturant of this invention provides a saponification action, particularly when a slight excess of a free fatty acid is used, and this produces a water insoluble soap whereby an ideal packing results, particularly adapted for use with water pump shafts of automobile engines and the like.

After treatment, that is, when the volatile portions have been driven off, the packing is absolutely moisture free, and neither is there any free acid or alkali present, and accordingly, no chemical or physical changes can take place in the saturant, while at the same time it is quite impervious to heat, remaining inert at least up to a temperature of 250° F.

I am aware that many changes may be made and numerous details of the method varied throughout a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than as necessitated by the prior art.

I claim as my invention:

1. An impregnating material for gaskets comprising aluminum stearate partially decomposed to a gummy consistency in solution with benzol and carbon tetrachloride with a suitable thinner.
2. A method of liquid proofing a gasket, including the preliminary partial decomposition of a metallic fatty acid salt to a gummy consistency, the dissolving of the resinous residue in a suitable solvent, to a desired degree of viscosity, impregnating the gasket and subsequently evaporating off substantially all of the solvent.
3. A method of liquid proofing a gasket, including the preliminary partial decomposition of a metallic fatty acid salt to a gummy consistency, the dissolving of the resinous residue in a mixture of carbon tetrachloride and benzol, to a desired degree of viscosity, impregnating the gasket and subsequently evaporating off substantially all of the solvent.

BENJAMIN J. VICTOR.