Patented Jan. 7, 1941 2,227,862

# UNITED STATES PATENT OFFICE

2,227,862

## ANTIFRICTION MATERIAL

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No Drawing. Application July 30, 1938, Serial No. 222,296

5 Claims. (Cl. 91—68)

This invention relates to an improved anti-friction material, more particularly a suitably impregnated fibrous material adapted to be used as a packing or as an interliner.

In accordance with this invention I have found that a valuable anti-friction material, suitable for use wherever it is desired to diminish or control frictional effects, may be formed by impregnating a fibrous material, in woven, spun, sheet or other form, as, for example, asbestos, cotton, rayon, hemp, flax, and in particular paper or other absorbent cellulosic material in sheet form, with a composition comprising solid polychlornaphthalenes, as penta- or hexachlornaphthalene, or mixtures thereof, etc., and a fixing agent selected from the group consisting of zinc stearate and hydrogenated castor oil.

The impregnation in accordance with my invention will ordinarily be carried out by immersing the fibrous material, in any desired form, as paper sheets, in a bath of the impregnating composition maintained at a temperature sufficient to render it fluid, but not high enough to injure the fibrous material. This temperature will, of course, depend upon the exact composition of the impregnating bath, and, as regards the upper limit, upon the nature of the fibrous material being treated.

The proportions of ingredients used in forming the impregnating bath in accordance with this invention are not critical and may vary rather widely, depending upon the particular use for which the impregnated material is intended. Thus the impregnating bath, when zinc stearate is used, may comprise from about 12 to about 92% polychlornaphthalene by weight; or, when hydrogenated castor oil is used, from about 14 to about 93% polychlornaphthalene.

The time of impregnation should be sufficient to permit substantially complete saturation of the fibrous material, but will vary with the temperature of the bath and the porosity and absorbency of the material being impregnated.

The following examples are illustrative of practical procedure in accordance with my invention:

100 parts by weight of polychlornaphthalene, preferably a mixture of penta- and hexachlornaphthalenes, are melted and the temperature raised to about 325° F. Then 135 parts by weight of zinc stearate are added gradually with constant agitation. During the addition of the zinc stearate the temperature should not be allowed to fall below about 285° F. The mixture is allowed to cool and stand for a few nours. It is then remelted and the temperature raised to 300° F. The material to be impregnated is then immersed in the molten liquid. The length of time of immersion will depend on the thickness and nature of the material to be impregnated. For paper up to .050" thick an immersion time of one minute will produce an article that is both water- and oil-proof and possesses good abrasive resistance between two relatively moving parts.

Impregnated paper so produced is suitable for use as an interliner for leaf springs, and for shims, or as a hood lacing in automobiles.

A similar product, but one possessing specifically different properties can be made by using a bath comprising 100 parts by weight of polychlornaphthalene and 600 parts by weight of zinc stearate.

An impregnating bath suitable for use with paper, asbestos, or various textile fibers may be formed by melting 100 parts by weight of hydrogenated castor oil, raising the temperature to 325° F., then adding 200 parts by weight of polychlornaphthalenes, preferably a mixture of penta- and hexachlornaphthalene, and as soon as the mixture is all melted, subjecting it to rapid agitation.

By immersing paper .045" thick in this impregnating bath at a temperature of about 300° F. the paper is rendered waterproof and oilproof and shows remarkable resistance to abrasion, as well as lubricating properties. It is suitable for interliners for leaf springs on motor cars, railroad trains, trolley cars, subway and elevated trains, trucks and busses. This material is also suitable for body shims, hood lacing or for window channel lubrication in motor cars.

A mixture of 150 parts by weight of hydrogenated castor oil and 50 parts by weight of polychlornaphthalene, made as described above, makes a suitable impregnating bath for paper to be used between the soles of shoes to render them damp-proof and to prevent squeaking.

A mixture of 50 parts by weight of hydrogenated castor oil and 150 parts by weight of polychlornaphthalene, made as described above, makes a suitable impregnating bath for paper to be used as a hood lacing on motor cars.

As indicated above, the impregnated anti-friction material in accordance with my invention is adapted for many diverse uses, and indeed may be used wherever it is desirable to diminish or control the friction developed between two objects.

When used as an interliner between the leaves of a leaf spring it gives the springs a constant lubrication, without the use of any grease or oil, and therefore eliminates any noises in the springs at all times. It also creates a constant frictional damping action between the spring leaves, and thus cuts down the throw of the springs on a supported member. In the case of a motor car it cuts down the amplitude velocity, and acceleration of the throw of the springs on the car body, and thus improves the riding qualities of the motor car. It prevents the road noise from entering the car body through the springs.

When used as body shims it prevents noise from developing should movements be set up among the members supported by these shims. When used as hood lacing in motor cars it prevents noise from developing should there be movements set up in the hood cover. When used as a window channel lining it will prevent any sticking of the windows.

A fibrous material impregnated in accordance with my invention may also desirably be used as a packing for stuffing-boxes and the like, as in a water-pump.

It will be understood that the details and examples hereinbefore set forth are illustrated only and in no way limit the scope of my invention as set out in the accompanying claims.

What I claim and desire to protect by Letters Patent is:

1. An article of the type described comprising a fibrous material impregnated with a composition substantially consisting of a solid polychlornaphthalene and hydrogenated castor oil.

2. An article of the type described comprising a fibrous material impregnated with a composition substantially consisting of a polychlornaphthalene containing at least five chlorine atoms and hydrogenated castor oil.

3. An article of the type described comprising a fibrous material impregnated with a composition comprising a solid polychlornaphthalene and hydrogenated castor oil, said composition containing from about 14 to about 93% polychlornaphthalene by weight and the balance being substantially hydrogenated castor oil.

4. An article of the type described comprising a sheet of absorbent cellulosic material impregnated with a composition comprising a solid polychlornaphthalene and hydrogenated castor oil, said composition containing from about 14 to about 93% polychlornaphthalene by weight, and the balance being substantially hydrogenated castor oil.

5. An article of the type described comprising a sheet of paper impregnated with a composition comprising a solid polychlornaphthalene and hydrogenated castor oil, said composition containing from about 14 to about 93% polychlornaphthalene by weight, and the balance being substantially hydrogenated castor oil.

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