

UNITED STATES PATENT OFFICE

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MOTHPROOFING AGENT

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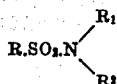
No Drawing. Application June 20, 1932, Serial No. 618,341. In Germany September 16, 1931

8 Claims. (Cl. 167—37)

The present invention relates to a process of protecting materials against attack by textile pests and to the compositions employed therein.

In the copending U. S. application Ser. No. 371,050, filed June 14, 1929, agents are described for rendering wool, fur, hair, feathers and the like proof against attack by moths.

These moth proofing agents generally consist of arylsulfonic acid amides of the general formula:

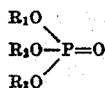


wherein R stands for an aromatic nucleus, R₁ and R₂ stand for hydrogen or a radical selected from the group consisting of alkyl radicals, aryl and aralkyl, and wherein all nuclei may further contain a substituent selected from the group consisting of hydroxy-, halogen-, alkyl-, aryl-, alkylacydylamino-, arylacydylamino-, sulfonic acid- and carboxylic acid groups.

These compounds are highly active moth proofing agents, and, furthermore, excellently protect wool, feathers, hair and the like also against the attack by other important textile pests, such as anthrenus fasciatus, attagenus japonicus or attagenus piceus ol. Thereby they differ from other moth proofing agents, such as chlorinated naphthalenes, cinchona alkaloids and esters of phosphoric acid which are effective against moths, but ineffective against these textile pests.

The application of these arylsulfonic acid amides, however, was limited hitherto, as they are not sufficiently soluble in benzene, carbon tetrachloride or trichlorethylene which are being principally used in dry cleaning, and therefore could not be used for such finished articles, for instance, clothes, furs, upholstered furniture, museum specimens liable to attack by moths of felt in pianos, as are not suitable for a treatment with a water solution.

We have now found that arylsulfonic acid amides of the above formula which are free from free sulfonic or carboxylic acid groups, when mixed with phosphoric acid esters of the general formula:



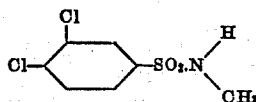
wherein R₁, R₂, R₃ means similar or dissimilar radicals selected from the group consisting of

alkyl, aryl and aralkyl radicals which may contain substituents selected from the group consisting of halogen (Cl, Br.) and alkoxy (OCH₃, OC₂H₅), are very easily soluble in benzene, carbon tetrachloride, trichlorethylene and other organic solvents. Therefore, such mixtures can be used in the customary dry cleaning solvents for protecting the articles mentioned above against attack by moths or other textile pests.

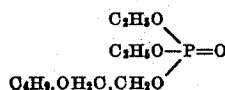
These new mixtures generally represent colorless or faintly colored oils. The quantity of the active components to be applied for protecting materials against textile pests may vary within wide limits. For the mixture we generally use about two parts by weight of phosphoric acid ester, such as the diethylbutylglycolphosphate, and one part by weight of an arylsulfonic acid amide, such as the 3,4-dichlorobenzenesulfomethylamide. The new compositions may be applied in any of the known manners. Thus, for example, the oil can be dissolved in benzene and sprayed on the materials to be protected or the same can be soaked with the solution or otherwise moistened therewith.

The following examples will illustrate our invention, but without limiting it thereto. The parts are by weight.

Example 1.—Wool, feathers or hair are treated in a benzene solution of the mixture containing 2 parts of 3,4-dichlorobenzene-sulfomethylamide of the formula



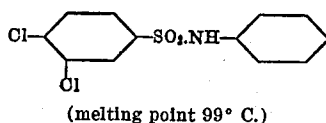
and 3 parts of diethylbutylglycolphosphate of the formula:



After complete penetration, the goods are taken out and centrifuged so that from one to two per cent of the mixture of amide and phosphoric ester remains on the material after evaporating the solvent. Instead of immersing the goods into the solution, they can be treated therewith in any other suitable manner. By this treatment the goods become protected against the attack by textile pests.

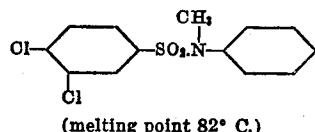
Example 2.—In the same manner goods are treated in a benzene solution containing a mixture

of 1 part of 3,4-dichlorobenzenesulfophenylamide of the formula:



and 1.5 parts of the phosphoric acid ester mentioned in Example 1.

10 **Example 3.**—The goods are treated in a carbon tetrachloride solution containing a mixture of one part of 3,4-dichlorobenzenesulfomethylphenylamide of the formula:



20 in 1 part of triethylphosphate and 0.5 part of diethylbutylglycolphosphate.

25 **Example 4.**—The goods are treated with a trichloroethylene solution of 1 part of 3,4-dichlorobenzenesulfo-2-methylbenzeneamide (melting point 110° C.) in 0.5 part of triethylphosphate and 1 part of diethylbutylglycolphosphate.

30 **Example 5.**—The goods are treated with a carbon tetrachloride solution of 1 part of 3,4-dichlorobenzenesulfamide (melting point 136° C.) and 2 parts of triethylphosphate.

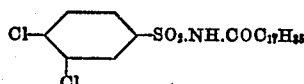
35 **Example 6.**—The protecting solution consists of trichloroethylene containing a mixture of 1 part of dichlorobenzenesulfodimethylamide (melting point 128° C.) and 1.5 parts of triethylphosphate.

40 **Example 7.**—The protecting solution consists of benzene containing a mixture of 1 part of 3,4-dichlorobenzenesulfodiethylamide (melting point 58° C.) and 1.5 parts of tri-isoamylphosphate.

45 **Example 8.**—The protecting solution consists of benzene containing a mixture of 1 part of 3,4-dichlorobenzenesulfodibutylamide (melting point 56° C.) and 1.5 parts of dibutylamylphosphate.

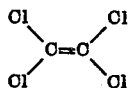
50 **Example 9.**—The protecting solution consists of carbon tetrachloride containing a mixture of 1 part of 3,4-dichlorobenzenesulfobutylamide (melting point 77° C.) and 1.5 parts of tricresylphosphate.

55 **Example 10.**—The protecting solution consists of trichloroethylene containing a mixture of 1 part of 3,4-dichlorobenzenesulfostearic amide of the formula:



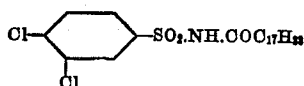
in 1.5 parts of diethylbutylglycolphosphate.

60 **Example 11.**—The protecting solution consists of perchlorethylene of the formula:



(boiling point 121° C.)

65 containing a mixture of 1 part of 3,4-dichlorobenzenesulfoleic amide of the formula:



70 and 1 part of diethylglycolphosphate and 1 part of tributylphosphate. Goods treated with the

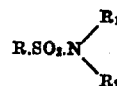
mixtures according to Examples 2 to 11 become protected against textile pests.

80 Instead of 3,4-dichlorobenzenesulfomethylamide there may be used 4-chlorobenzenesulfonamide, bromobenzenesulfomethylamide, nitrobenzenesulfomethylamide, chlorotoluenesulfomethylamide, 4-chlorobenzenesulfomethylphenylamide and the like.

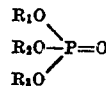
85 All these arylsulfamides, when mixed with the above mentioned esters of phosphoric acid, form compositions which are easily soluble in benzene, carbontetrachloride, trichloroethylene i. e. in organic solvents used in the dry cleaning process, and materials treated with such solutions become permanently protected against textile pests.

90 We claim:

1. A textile pest-proofing composition comprising a mixture of an arylsulfonic acid amide of the general formula:

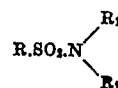


95 wherein R stands for an aromatic nucleus, and R1 and R2 stand for hydrogen or a radical selected from the group consisting of alkyl, aralkyl and aryl radicals, which may further contain a substituent selected from the group consisting of hydroxy, halogen, acidyl and alkyl- or aryl-acidylamino groups, but are free from free sulfonic and carboxylic acid groups, and a phosphoric acid ester of the general formula:

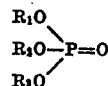


100 wherein R1, R2 and R3 mean similar or dissimilar radicals selected from the group consisting of alkyl, aralkyl and aryl radicals, which may further contain a substituent selected from the group consisting of halogen and alkoxy groups, said compositions being soluble in organic solvents and generally representing colorless or faintly colored oils.

105 2. A textile pest-proofing composition comprising a mixture of an arylsulfonic acid amide of the general formula:

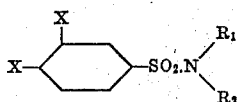


110 wherein R stands for a benzene nucleus, and R1 and R2 stand for hydrogen or a radical selected from the group consisting of alkyl, aralkyl and aryl radicals, which may further contain a substituent selected from the group consisting of hydroxy, halogen, acidyl and alkyl- or aryl-acidylamino groups, but are free from free sulfonic and carboxylic acid groups, and a phosphoric acid ester of the general formula:

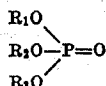


115 wherein R1, R2 and R3 mean similar or dissimilar radicals selected from the group consisting of alkyl, aralkyl and aryl radicals, which may further contain a substituent selected from the group consisting of halogen and alkoxy groups, said compositions being soluble in organic solvents and generally representing colorless or faintly colored oils.

3. A textile pest-proofing composition comprising a mixture of an arylsulfonic acid amide of the general formula:

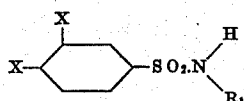


wherein one X stands for a halogen atom, and the other X stands for hydrogen or a halogen atom; R₁ and R₂ stand for hydrogen or a substituent selected from the group consisting of alkyl, aralkyl and aryl radicals, which may further contain a substituent selected from the group consisting of hydroxy, halogen, alkyl, aryl, acidyl and alkyl- or aryl-acidylamino groups, but are free from free sulfonic and carboxylic acid groups, and a phosphoric acid ester of the general formula:

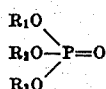


wherein R₁, R₂ and R₃ mean similar or dissimilar radicals selected from the group consisting of alkyl, aralkyl, and aryl radicals, which may further contain a substituent selected from the group consisting of halogen and alkoxy groups, said compositions being soluble in organic solvents and generally representing colorless or faintly colored oils.

4. A textile pest-proofing composition comprising a mixture of an arylsulfonic acid amide of the general formula:

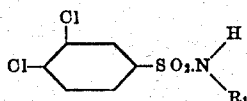


wherein one X stands for a halogen atom, and the other X stands for hydrogen or a halogen atom; R₁ stands for hydrogen or a substituent selected from the group consisting of alkyl, aralkyl and aryl radicals, and a phosphoric acid ester of the general formula:

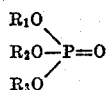


wherein R₁, R₂ and R₃ mean similar or dissimilar radicals selected from the group consisting of alkyl, aralkyl and aryl radicals which may further contain a substituent selected from the group consisting of halogen and alkoxy groups, said compositions being soluble in organic solvents and generally representing colorless or faintly colored oils.

5. A textile pest-proofing composition comprising a mixture of an arylsulfonic acid amide of the general formula:

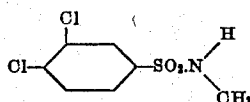


wherein R₁ stands for CH₃, C₂H₅ or C₄H₉, and a phosphoric acid ester of the general formula:

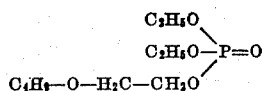


wherein R₁, R₂ and R₃ mean similar or dissimilar radicals selected from the group consisting of CH₃, C₂H₅, C₃H₇, C₄H₉, C₄H₉.OCH₂.CH₂, C₆H₅, CH₃.C₆H₄ and Cl.C₆H₄, said compositions being soluble in organic solvents and generally representing colorless or faintly colored oils.

6. A textile pest-proofing composition comprising a mixture of an arylsulfonic acid amide of the general formula:

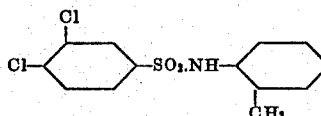


and a phosphoric ester of the formula:

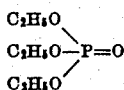


said composition being soluble in organic solvents and representing a colorless or faintly colored oil.

7. A textile pest-proofing composition comprising a mixture of an arylsulfonic acid amide of the general formula:

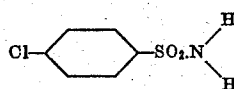


and a phosphoric acid ester of the formula:

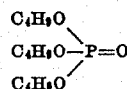


said composition being soluble in organic solvents and representing a colorless or faintly colored oil.

8. A textile pest-proofing composition comprising a mixture of an arylsulfonic acid amide of the general formula:



and a phosphoric acid ester of the formula:



said composition being soluble in organic solvents and representing a colorless or faintly colored oil.

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