

UNITED STATES PATENT OFFICE.

SIDNEY M. CADWELL, OF LEONIA, NEW JERSEY, ASSIGNOR TO THE NAUGATUCK CHEMICAL COMPANY, OF NAUGATUCK, CONNECTICUT, A CORPORATION OF CONNECTICUT.

METHOD OF DEODORIZING.

No Drawing.

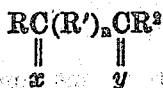
Application filed February 18, 1926. Serial No. 89,333.

This invention is concerned with a method for deodorizing materials and is particularly directed towards destroying the disagreeable odors arising from the putrefaction of nitrogenous substances.

Disagreeable odors occasioned by the putrefaction of nitrogenous materials such as proteins and the like have been destroyed by oxidizing the chemical compounds causing these odors by means of chlorine, ozone or hypochlorite. It has also been the practice to absorb such foul odors with activated carbon, silica gel or other material having similar properties. Another method of overcoming the nuisance of such odors has been to mask them with chemicals such as sulpho naphthol, phenol, or phenolic compounds. Under certain conditions the above methods and materials are open to objection. Certain of them are toxic and strongly corrosive. Others are unstable and they possess a strongly acid or strongly alkaline reaction which may be detrimental to fabrics and metals. Others of these materials are not convenient to handle.

The object of the present invention is to provide a cheap and convenient method of destroying the disagreeable odors, particularly those caused by the putrefaction of nitrogenous substances. Another object of the invention is to furnish a method for deodorizing decayed or decaying animal or vegetable products with a material which is substantially neutral in reaction and not harmful to fabrics or corrosive towards metals, and which is not strongly toxic. Other objects will be apparent from the specification and claims.

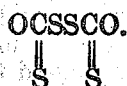
Briefly stated the invention comprises treating animal or vegetable products with compounds of the type



where R and R² are non-nitrogenous substituents, R' an element of the oxygen group such as oxygen or sulphur and X and Y are bivalent elements or groups. More particularly it comprises treating animal and vegetable matters subject to decay or already in a stage of decay with non-nitrogenous disulphides, sulphides or oxides in which the

carbon attached to the disulphide, sulphide or oxide or dioxide is doubly bonded to an element or group, as for example oxy normal butyl thiocarbonic acid disulphide, acyl sulphides or oxides.

The preferred deodorizing material is oxy normal butyl thiocarbonic acid disulphide, which is representative of a class of substances which contain the grouping



Oxy normal butyl thiocarbonic acid disulphide may be used in solution or in a dispersion or in any other manner desired. A suitable dispersion may be made by dissolving 30 parts of glue in 90 parts of water heated over a steam bath. Into the glue solution is then stirred 1/2 part by weight of sodium oleate, a high speed stirrer being employed. A solution of 30 parts by weight of oxy normal butyl thiocarbonic acid disulphide in 60 parts by weight of solvent naphtha is then added slowly to the glue solution, meanwhile stirring with a high speed stirrer and continuing until the emulsion is stable. A dispersion of the disulphide in glue and water may be made without first dissolving the disulphide in solvent naphtha. Other protective colloids may be employed instead of glue. As stated above the oxy normal butyl thiocarbonic acid disulphide may be used as a solution in an organic solvent, or it may be also employed in its undiluted form.

The dispersion above described may be poured over the decayed or putrefied animal or vegetable matter or combined with it in any suitable manner. In general an amount of disulphide equivalent to approximately 1% of the weight of the decaying or decayed material will be found sufficient to destroy the disagreeable odors arising from putrefaction of the nitrogenous material therein, but larger or smaller amounts may be employed if desired.

The dispersion or solution or original material itself may be employed to deodorize fertilizers, garbage, sewage, glue and slaughter house wastes. The dispersion may likewise be used to destroy the foul odors which arise in rubber latex, particularly

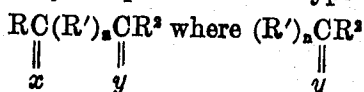
when the proteins contained therein have undergone decomposition. The aqueous dispersion of oxy normal butyl thiocarbonic acid disulphide may be simply stirred into the latex and distributed uniformly throughout the latex, 1% on the weight of the rubber being a sufficient quantity of the disulphide. Inasmuch as the disulphide possesses a substantially neutral reaction, it may be added to rubber latex without fear of its causing coagulation or any other deleterious reactions in the latex.

Evil smelling rubbers may be soaked in a dispersion of oxy normal butyl thiocarbonic acid disulphide containing 1 part of the disulphide per 100 parts of water. Preferably the rubber to be treated is not more than $\frac{1}{4}$ " in thickness.

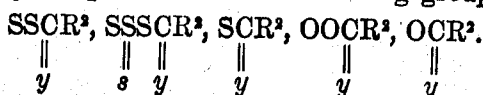
While in general the substances which are subject to decomposition comprise animal or vegetable proteinogenous bodies, such as flesh and vegetation, it is understood that the invention is not limited to the application of this new class of deodorizers to the materials above mentioned.

Instead of oxy normal butyl thiocarbonic acid disulphide, the following compounds may be employed: oxy ethyl thiocarbonic acid disulphide, dithiobenzoyldisulphide, benzoyl peroxide, acid anhydrides or thioacid anhydrides, tetra sulphides prepared by the interaction of sulphur chloride with salts of non-nitrogenous dithioacids. Benzoyl peroxide is somewhat soluble in water and may be employed therefore in an aqueous solution. Furthermore its decomposition products are substantially odorless, whereas oxy normal butyl thiocarbonic acid disulphide may give rise to some odor, although this will not be as strong as those of the phenols, etc.

The property of deodorizing the putrefaction products of nitrogenous material is exhibited by compounds of the type



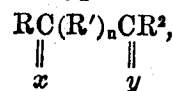
may comprise one of the following groups:



In this type formula $(\text{R}')_n$ comprises at least one atom of the oxygen group, but n may be greater than one, as in the case of dioxides and peroxides, disulphides and polysulphides. This class of deodorizers is characterized by the presence of a carbon atom having a double bond attached thereto, and being adjacent to an atom of the oxygen group, particularly sulphur or oxygen.

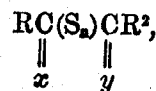
Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. The process of deodorizing the putrefaction products of nitrogenous material which consists in adding to such material compounds of the type



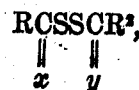
where R and R² represent non-nitrogenous substitutions, R'_n at least one atom of the oxygen group and x and y any bivalent substitution.

2. The process of deodorizing the putrefaction products of nitrogenous material which consists in adding to such material compounds of the type



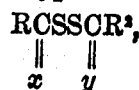
where R and R² are non-nitrogenous substitutions, and x and y are bivalent substitutions, and where the value of n in (S_n) is at least one.

3. The process of deodorizing the putrefaction products of nitrogenous material which consists in adding to such material compounds of the type



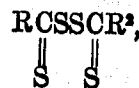
where R and R² are non-nitrogenous substitutions and x and y are bivalent substitutions.

4. The process of deodorizing the putrefaction products of nitrogenous material which consists in adding to such material compounds of the type



where R and R² are non-nitrogenous substitutions and x and y atoms of the oxygen group.

5. The process of deodorizing the putrefaction products of nitrogenous material which consists in adding to such material compounds of the type



where R and R² represent non-nitrogenous substitutions.

6. The process of deodorizing the putrefaction products of nitrogenous material which consists in adding to such material non-nitrogenous organic disulphides containing more than one carbon atom and in whose structure there is a double bond adjacent a carbon atom.

7. The process of deodorizing the putrefaction products of nitrogenous material

which consists in adding to such material compounds of the type



where R and R² comprise the same non-nitrogenous group.

8. The process of deodorizing the putrefaction products of nitrogenous material which consists in adding to such material

non-nitrogenous derivatives of thiocarbonic acid disulphides.

9. The process of deodorizing the putrefaction products of nitrogenous material which consists in adding to such material oxy normal butyl thiocarbonic acid disulphide.

Signed at New York, county and State of New York, this 9th day of February, 1926.

SIDNEY M. CADWELL.