UNITED STATES PATENT OFFICE.

JOHN MURPHY, OF NEW YORK, N. Y.

IMPROVEMENT IN THE MANUFACTURE OF INDIA-RUBBER HOSE AND TUBING.

Specification forming part of Letters Patent No. **188,303**, dated March 13, 1877; application filed August 14, 1876.

To all whom it may concern:

Be it known that I, JOHN MURPHY, of the city, county, and State of New York, have invented certain new and useful Improvements in the Manufacture of India-Rubber Hose and Tubing; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same.

India-rubber hose made by coating cotton-duck, or other fabric, with a vulcanizable compound of rubber or other equivalent gum, is liable to decay by the action of mildew, dry-rot, and the like, upon the fabric on which the strength of the hose depends.

I have heretofore remedied this to a certain extent by the use of carbolic acid and similar antiseptics. Others have applied the salts of copper, which contain strong corrosive acids, such as the sulphuric, nitric, and muriatic acids. These salts of copper will, when applied to canvas, prevent mildew and decay; but when applied to duck or canvas, and then the duck or canvas subjected to the heat of vulcanization, as it must be in forming rubber hose, these salts containing corrosive acids are decomposed, and the acid then acts upon the duck or canvas so as to destroy it during the course of manufacture. This fact I have thoroughly demonstrated by experiment.

The object of my invention is, therefore, to secure the well-known properties of copper in preventing decay, and make them applicable in the manufacture of rubber hose; and to this end my invention consists in saturating or impregnating the cotton-duck or other fabric employed in making hose, previous to being made up into hose, with any chemical preparation of copper which contains no corrosive acid, that, on being set free during the heating required for vulcanization or curing, would injure the fabric. Among such compounds of copper may be mentioned arsenite of copper, (Scheele's green,) arseniate of copper, oxide of copper, Schweinfurth green, and other neutral preparations of copper, which do not contain any acid capable of corroding cotton duck or canvas.

The following description will enable others skilled in the art to make and use my invention.

I take any copper preparation free from corrosive acids in their composition. If they are soluble in any neutral liquid they may be so dissolved as to form a bath, through which is passed the cotton-duck or other fabric. It is then passed through wringer-rolls, dried, and made into hose in the usual way. If the copper preparation is not soluble in some non-corrosive liquid, or if the liquid would be too expensive to use, I reduce the compound to a fine impalpable powder by grinding or otherwise; stir it into a water-bath, so as to form a sort of emulsion, through which I pass the canvas, then through a pair of wringer-rolls; after, let it dry, and then make up into hose in the usual way.

Hose made of fabric treated with the class of copper preparations herein named will go through the vulcanizing process without injury to the strength of the fabric, and the hose will not mildew or decay.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

The process herein described for preventing mildew and decay in rubber hose, the same consisting in saturating or impregnating the fabric of which the hose is made with a preparation of copper free from corrosive acid or acids, substantially as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOHN MURPHY.

Witnesses:

BENJ. P. SMITH,

H. W. HEWITT.