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GAS-RETAINING FABRIC.

No Drawing.

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This invention relates to the manufacture of gas retaining fabrics or the like particularly adapted for use on dirigibles although it is, of course, to be understood that it is applicable to various other uses where a gas impermeable and flexible covering is desired.

One of the objects of the present invention is to provide a gas retaining fabrics of the above general character which will be highly reliable and efficient in use.

A further object is to provide a fabric of the above character which may be easily and inexpensively manufactured.

A further object is to provide a fabric of the above character which may be conveniently handled and applied without danger of cracking.

Other objects will be in part obvious and in part hereinafter pointed out in connection with the following analysis of this invention.

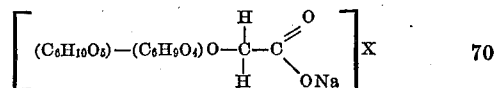
In order that a clearer perception of the present invention and the objects sought to be accomplished may be had it is to be noted that many gas retaining fabrics using goldbeater's skin as a base are subject to certain disadvantages such, for example, as the inconvenience of handling and great expense involved in using goldbeater's skin.

The fabric as hereinafter described is intended to overcome these disadvantages among others and it has been found that a gas impermeable film may be easily and inexpensively prepared from an aqueous solution of the soluble salts of the cellulose ethers of organic hydroxy-acids and the derivatives of such ethers, e. g., esters and ethers, suitably plasticized and stabilized. Such films may be prepared so as to give flexible and durable films which are impermeable to gases.

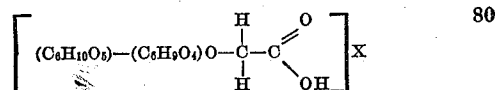
For use as a substitute for goldbeater's skin a gas impermeable film as above described may be obtained by spreading the solution directly upon a balloon fabric, fixing, plasticizing and stabilizing by means of suitable agents. It may be mixed with 30 per cent solution of rubber latex before application if desired. The film may also be applied to balloon cloth in the form of a sheet previously prepared and cemented to the cloth by means of a suitable adhesive. The balloon cloth may be replaced by rubberized fabric or other suitable proofed fabric. The film may be protected from mois-

ture by means of a coat of varnish or other proofing applied over its surface.

In carrying out the present invention we prefer to use for the purpose of a substitute for goldbeater's skin a suitable fabric coated with a material formed from the sodium salt of the cellulose ether of glycollic acid, as prepared from cellulose, alkali and chloroacetic acid in substantially the manner outlined in German Patent 332,203 (1921). The formula for the preparation of the sodium salt of the cellulose ether of glycollic acid is



Several coats of this material are preferably spread over a light weight balloon cloth and the fabric thus obtained is immersed in a 2% solution of acetic acid in order to render it insoluble in water. The formula of the acid produced by treatment with acetic or other acids of sufficient strength is



After this treatment the fabric with its coating is well washed with water and finally immersed in a 10% solution of glycerine. After being air-dried the resultant fabric is almost completely impermeable to gases. While the preparation of this material is described in the above referred to German patent, we prefer to use substantially the following ingredients and in the proportions stated:

Two hundred grams of air dried mercerized cotton are treated with 1000 grams of 20% sodium hydroxide and allowed to stand for three hours at room temperature. A suspension of 500 grams of the sodium salt of chloroacetic acid in 600 grams of alcohol is then kneaded into the mixture and the whole is allowed to stand overnight. The following morning the entire mass is stirred into 20 liters of water and purified by precipitation with alcohol. The purified product, when dispersed in the same amount of water is ready for the operations of spreading on balloon cloth, fixing, and plasticizing as outlined above.

From the above it will be seen that the present invention provides a suitable sub-

stitute for goldbeater's skin which may be inexpensively manufactured and easily handled and which will be highly reliable and efficient in use.

5 What we claim is:—

1. A gas retaining fabric comprising a base and a covering consisting of the solute from an aqueous solution of a soluble salt of the cellulose of glycollic acid and the derivatives of such ethers.

2. A gas retaining fabric comprising a base and a thin film thereon, said film consisting of the solute from an aqueous solution of a soluble salt of the cellulose ethers of glycollic acid and the derivatives of such ethers.

3. A gas retaining fabric comprising a base and a covering therefor consisting of the solute from an aqueous solution of a soluble salt of the cellulose ethers of glycollic acid and the derivatives of such ethers mixed

with 30 per cent rubber latex before application.

4. A method of preparing a gas retaining fabric consisting in coating a fabric with an aqueous solution of a soluble salt of the cellulose ethers of glycollic acid, obtaining the residue of the solvent after coating, immersing in a two percent solution of acetic acid, bathing in water, and immersing in a solution of ten per cent glycerine.

5. A method of rendering fabric impermeable to gases consisting in coating the fabric with an aqueous solution of a soluble salt of the cellulose ethers of glycollic acid, rendering the residue therefrom insoluble by immersing in acetic acid, plasticizing, and proofing against moistures.

Signed at Washington, District of Columbia, this 31st day of July, 1925.

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