

UNITED STATES PATENT OFFICE.

CHARLES JAMES GRIST, OF LONDON, ENGLAND.

PROCESS OF MAKING OIL FABRICS.

SPECIFICATION forming part of Letters Patent No. 596,872, dated January 4, 1898.

Application filed April 7, 1897. Serial No. 631,158. (No specimens.) Patented in Belgium March 5, 1895, No. 114,385; in England November 15, 1895, No. 21,742; in Germany January 10, 1896, No. 92,086; in France January 31, 1896, No. 253,585, and in Austria February 9, 1897, No. 441.

To all whom it may concern:

Be it known that I, CHARLES JAMES GRIST, a subject of the Queen of Great Britain, residing at 20 Gracechurch Street, in the city of London, England, have invented a certain new and useful Improvement in Processes of Making Oil Fabrics, (for which I have received Letters Patent in Great Britain, No. 21,742, dated November 15, 1895; in Belgium, No. 114,385, dated March 5, 1895; in France, No. 253,585, dated January 31, 1896; in Austria, No. 441, dated February 9, 1897, and in Germany, No. 92,086, dated January 10, 1896,) of which the following is a specification.

In United States Patent No. 574,793, granted January 5, 1897, to Alfred W. Ford, is described a certain process for producing what are called "oil fabrics," such process practically consisting in first preparing the oil, which is preferably linseed-oil, so that it will dry rapidly, this being accomplished by subjecting it to a temperature of 350° Fahrenheit for a period of about ten hours, then repeatedly dipping therein the fibers to be coated and permitting them to drain, then placing them on a wire gauze shelf to permit them to be oxidized, and after oxidation the fibers are ground up and applied to the surface of textile or other fabrics.

The present invention consists of improvements in the above process, whereby more perfect results are obtained, all as hereinafter more fully set forth.

In attempting practical working in accordance with the foregoing specification I have found that the temperature and time during which the oil should be treated should be considerably increased, and to this end I propose, preferably, partially to oxidize the oil by adding thereto about one pound of litharge or a sufficient quantity of other suitable oxidizing agent to each two gallons of oil, and to subject the mixture to a temperature of about 400° Fahrenheit or upward for twenty-four to forty-eight hours, the oil being kept stirred or in motion during that period, after which it is allowed to cool down to its normal temperature. The addition of litharge is not essential, but promotes the rapid drying of the oil. The increased temperature and stirring are, however, practically essen-

tial if the best results are to be obtained. I now take a suitable fibrous substance—such, for instance, as jute, hemp, cotton, animal fiber, or other suitable fiber—in which the separate fibers composing the mass are or can be made to be distinct and separable, but at the same time of uniform or substantially uniform character, and first cleaning them, so that the fibers shall be clean and free from any deleterious foreign substance in mixture or adhering to them. I then spread and loosen the fibers, subjecting them to the action of heated air in order to remove as far as possible every particle of visible as well as hygrometric moisture, because any moisture present militates against the success of the process. The partially-oxidized oil being now at about its normal temperature—say, that of the room in which operations are carried on—and the fibers in a clean and absolutely dry condition I immerse such fibers in a loosened and separated condition into the oil, but immediately take them out again. The fibers after being dipped are placed in a hydro-extractor of the usual or any convenient pattern for the purpose of extracting the superfluous oil not actually adhering to the fibers, as I find the simple draining of the fibers, as described in said prior specification, totally inadequate, as this leaves drops of oil at intervals, and the oil within these drops does not become fully oxidized. When this has been effected and the free oil has been thoroughly removed, I take the fibers out of the extractor, and each fiber will be found to be covered at intervals with small globules of oil which adhere to it. I now pull apart or separate the fibers and spread them as loosely as possible on wire-gauze or other suitable netting or reticulate or open-work surface and pass a current of heated air for suitable periods through them by means of a revolving fan or other suitable air-supplying means, turning the fibers every hour or so on the netting until each particle of oil is oxidized and dried. Then I again immerse the fibers in the oil and again throw off the superfluous oil by means of the hydro-extractor or its equivalent, and more globules of oil will be found to be adhering to portions of the fibers not covered after the first dipping. Then I re-

peat the separating and drying process explained above, and when dry I immerse the fibers a third and last time, subjecting them to the action of the hydro-extractor, as before, when the fibers will be completely coated, or nearly so, with globules of oil, and the drying process will be accomplished as before.

I have not found it economically useful to subject the fibers to more than three dip-
 10 pings of oil, as the object is to give only one coating to each fiber, and this is attained by partially coating portions of the surfaces of the fibers at each immersion, and this is generally sufficiently completed after three im-
 15 mersions, and more have a bad effect, as if the fibers are overcoated complete oxidation is impracticable.

I now grind up the fibers treated as described above until they become of a homo-
 20 geneous character. This masticating or grinding I prefer to accomplish by means of any suitable rolls having different surface velocities and running at a high speed. The material is then passed through crushing-rolls which I
 25 employ cold, and I add about five per cent. to ten per cent. of powdered sulfur to it while the crushing is progressing, taking care that the fibrous-treated material is not allowed to become so heated as to injure it. This I pre-
 30 vent by occasionally stripping it off the rolls by means of a knife or gage or other suitable appliance. When the sulfur is thoroughly mixed, I allow the material to cool to about normal temperature, and if the material is to
 35 be colored I then again pass it through the crushing-rolls and add whatever coloring material is desired—such as French chalk, ocher, or other coloring agent adapted to the particular purpose in view. The material as
 40 now delivered from the rolls is in sheets and ready for use, and it can, when cool, be stored away until required.

For waterproofing and for other purposes—such as bed-sheeting, clothing, double tex-
 45 ture, and other goods—I may proceed as follows: The material in sheets is again put through the rolls and then it is immersed in naphtha, turpentine, or other suitable solvent, the superfluous spirit being carefully re-
 50 moved, and I then place the material again in the crushing-rolls and work it until it is in such a soft pliable condition that it will readily adhere to a material or fabric under pressure which it is necessary to coat, or to
 55 other pieces of my improved material. It can be run onto the fabric in any convenient thickness by passing the materials to be combined through heavy calenders or rolls and within a few hours afterward it will be ready
 60 for use, or it can be spread on fabric in very thin layers, if required for fine and delicate goods, by the ordinary spreading-machines, such as are in use in rubber factories. By this means a material is produced which will

withstand climatic influences and will resist 65 wear and not crack or perish and also be pliable, while the saving in labor required to be expended is great and the goods require less time in manufacture.

What I claim is—

1. The improved process of making oil fab-
 70 rics, consisting in partially oxidizing the oil by boiling it at a temperature of about 400° Fahrenheit, or upward for a period of from
 75 twenty-four to forty-eight hours, all the while keeping it stirred or otherwise in motion al-
 80 lowing the temperature to fall to normal, removing positively all moisture of every kind from the fibers by drying, then immersing the fibers in the oil, removing them from the oil, and positively removing therefrom all super-
 85 fluous or free oil not actually adhering to the fibers, separating the fibers from each other, drying the same, and finally grinding up the same to form a homogeneous mass, substan-
 90 tially as described.

2. The improved process of making oil fab-
 95 rics, consisting in partially oxidizing the oil by boiling it at a temperature of about 400° Fahrenheit, or upward for a period of from
 100 twenty-four to forty-eight hours, all the while keeping it stirred or otherwise in motion al-
 105 lowing the temperature to fall to normal, removing positively all moisture of every kind from the fibers by drying, then immersing the
 110 fibers in the oil, removing them from the oil, and positively removing therefrom all super-
 115 fluous or free oil, not actually adhering to the fibers, separating the fibers from each other, drying, and finally grinding up the same to
 120 form a mass, and working sulfur in the same, substantially as described.

3. The improved process of making oil fab-
 125 rics, consisting in partially oxidizing the oil by boiling it at a temperature of about 400° Fahrenheit, or upward for a period of from
 130 twenty-four to forty-eight hours, all the while keeping it stirred or otherwise in motion, al-
 135 lowing the temperature to fall to normal, removing positively all moisture of every kind from the fibers by drying, then immersing the
 140 fibers in the oil, removing them from the oil, and positively removing therefrom all super-
 145 fluous or free oil not actually adhering to the fibers, separating the fibers from each other, drying, grinding up the same to form a ho-
 150 mogeneous mass, working the latter with a solvent and forming it into sheets, and ap-
 155 plying the sheets to a fabric, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES JAMES GRIST.

Witnesses:

WALTER J. S. RERTEN,
 T. J. OSMAN.