UNITED STATES PATENT OFFICE.

GARDNER TUFFTS VOORHEES, OF BOSTON, MASSACHUSETTS.

INSULATING-COVERING FOR REFRIGERATIVE PURPOSES.

SPECIFICATION forming part of Letters Patent No. 530,214, dated December 4, 1894.

Application filed June 21, 1892. Serial No. 437,470. (No specimens.)

To all whom it may concern:

Be it known that I, GARDNER TUFFTS VOORHEES, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Insulating-Covering for Refrigerative Purposes, of which the following is a specification.

My invention is an improved insulating covering for pipes through which is conveyed a cooling liquid and for use as a non conconductor for cold storage rooms, refrigerators and the like and its object is to provide a covering which will protect such pipes or chambers from the influence of an outside temperature which is different from that therein and at the same time provide a covering which can be readily applied and which will adhere and fit, and harden.

I have discovered that pipes and other chambers provided with a coating of sheet material composed of hair felt, saturated with melted resin, are admirably adapted for cold storage or refrigerating purposes.

The advantages of my invention are especially noticeable when used with brine pipes which are subjected to the temperature of the atmosphere, much greater than that of the brine; for by my invention the cooling fluid or brine may be conveyed to a great distance without appreciable increase of its temperature and the great inconvenience which has resulted from the accumulation of moisture upon the pipes in the form of porous ice; for my invention prevents the collection of frost and moisture upon the covering for the reason that the temperature of the prepared felt is but slightly affected by the temperature within the pipe; the heat penetrating the covering so slowly that even when the brine is at a temperature much below the freezing point of water the outer surface of the covering will be substantially at the temperature of the atmosphere, and there will be little or no condensation.

For brine pipes I use the soaked felt in strips whose width is equal to the circumference of the pipe, and fold these strips about the pipe butting the edges; so that when the strip cools the pipe has one layer of the covering which is firm and durable. A second layer is then applied breaking joints with the first layer. Two layers each about one inch in thickness will make a more perfect insulation than any other of which I have knowledge.

It will be obvious that my covering will answer well in making refrigerators, and cold chambers generally; and also where water pipes are exposed to winter temperature; for although in this latter case it acts to prevent the water in the pipes from cooling and in all other cases to prevent the contents of the pipes or chambers from warming, yet the principle and mode of operation is the same substantially; namely the outside temperature is prevented from unduly affecting the inside temperature.

In practice I prefer to use resin softened a little in the usual way with paraffine or other suitable oil, grease or wax which makes the resin less brittle; also the resin can be cut with a volatile oil, and the felt saturated by soaking it in the solution.

The soaked felt may be molded to form half cylinders two of which can be applied by cementing them edge to edge about a pipe; and other forms may, of course, be molded to suit special uses.

I am aware that mixtures of resin and hair or other fiber, with other ingredients, are described in some or all of the following patents, viz: English Patents No. 2,870, of 1866, and No 3,051, of 1868; United States Patents No. 39,689, dated September 15, 1863; Reissue No. 1,342, dated September 9, 1862; Nos. 21,007 and 434,885, dated August 15, 1890; No. 62,236, dated February 19, 1867, and Reissue No. 10,351, dated July 3, 1883; and I disclaim all that is shown in them; for as will now be clear my invention is a composition of matter composed of hair which is first formed into sheets by felting, and then saturated with resin, the result being a new sheet material of great value as a nonconductor of heat; and which is substantially different from any mixture of hair or other fiber and resin; whether with other ingredients as gutta percha, caoutchouc or ground glass, or without other ingredients; for the fact that the fiber is not first felted into sheets makes all such mixtures substantially unlike my new composition of matter; that is, unfelted fiber

mixed with resin is wholly unlike a sheet of hair felt saturated with resin; and this will be plain if the difference between stirring or otherwise mixing together unfelted hair or other fiber, and soaking a sheet of hair felt in resin, be borne in mind.

What I claim as my invention is—

The improved refrigerating covering above described composed of sheets of felted hair each saturated with resin, substantially as and for the purposes specified.

GARDNER TUFFTS VOORHEES.

Witnesses:
JOHN R. SNOW,
J. MARTIN ALLY.