Dec. 3, 1935. L. R. LEE 2,022,727

CORK INSULATION

Filed Nov. 9, 1931

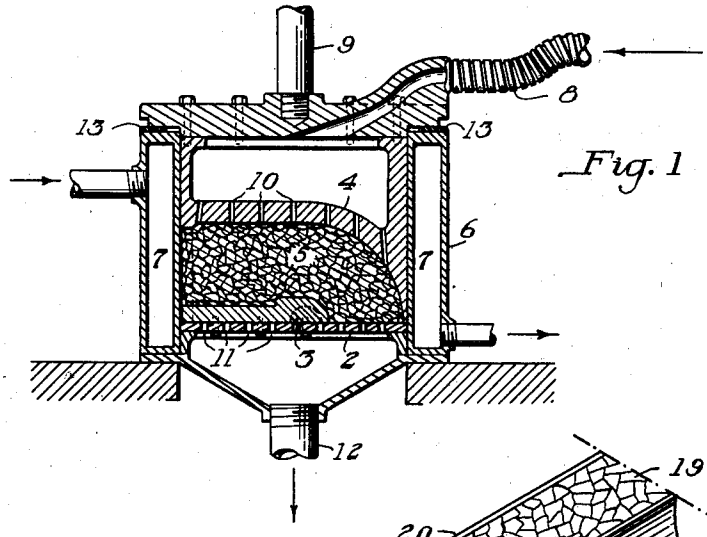


Fig. 1

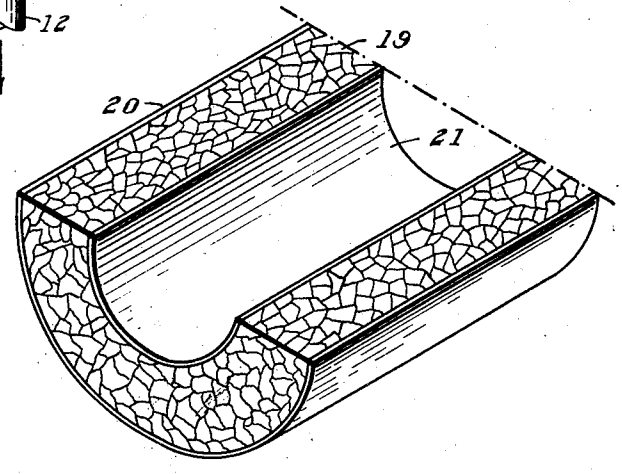


Fig. 3

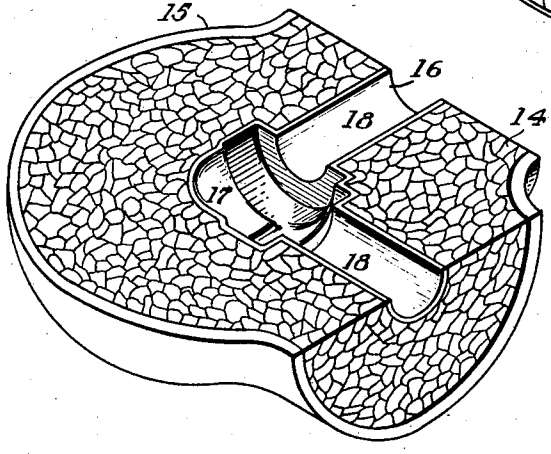


Fig. 2

Inventor
Louis R. Lee
by
Walter J. Kaufman
his Attorney

Published by AsbestosClaims.Law
asbestosclaims.law/library/22158/1

Patented Dec. 3, 1935 2,022,727

UNITED STATES PATENT OFFICE

2,022,727

CORK INSULATION

Louis R. Lee, Rohrerstown, Pa., assignor to Armstrong Cork Company, Lancaster, Pa., a corporation of Pennsylvania

Application November 9, 1931, Serial No. 573,834

5 Claims. (Cl. 154—44)

This invention relates to moulded cork pipe covering and fitting covers.

Heretofore pipe and pipe fitting covers made of cork have been manufactured by confining a mass of cork particles, with or without an additional binder, in a mould and externally applying heat to the mould for sufficient time to bake the mass. This method produces a coarse-grained material which has rough uneven edges and which exhibits a pitted surface even though sanded. Such material is objectionable for pipe and pipe fitting insulation because of its lack of uniform density and consequent lack of uniformity in insulating value. It is also unsatisfactory due to its open coarse-grained structure which results in frost pockets adjacent the fitting or pipe when the covering is used for insulating refrigeration lines. These prior art cork coverings cannot be held to close dimensions without costly cutting operations subsequent to baking. As a result, the commercial product has always exhibited uneven internal surfaces permitting air spaces adjacent the pipe or pipe fitting sought to be insulated.

My invention provides a cork cover for pipe and pipe fittings which is less expensive to manufacture and at the same time is more efficient than the covers heretofore available. It is an important object of my invention to produce a cork cover which will adhere closely to a pipe or pipe fitting and thus eliminate air spaces and frost pockets, and generally obviate the costly erection methods heretofore required to fill the voids characterizing the cork coverings heretofore available.

The word "fitting" as employed herein is intended to comprehend pipe jointing devices such as elbows, T's, nipples, unions, valves and the like.

I have discovered much of the erection and installation costs incident to the application of cork pipe covering arises from lack of uniformity of the cork coverings employed. For example, a broken or uneven corner of a cork covering will require additional care on the part of the workmen in insuring that a complete seal is made to prevent the infiltration of air where two halves of the covering are joined. An even more serious consideration is the time and effort spent in filling the joints between the covering and the pipe or fitting being insulated. Such filling must be done in refrigeration work if condensation and frost pockets are to be avoided. Moreover, the cork covering should be sealed to prevent air and moisture infiltration. My improved cork covering exhibits a character of surface well adapted for the reception of a mastic sealing coating.

In the accompanying drawing illustrating a mould for the carrying out of my method and production of my improved cork covering:

Figure 1 is a sectional elevation of the mould; and

Figures 2 and 3 are illustrations of cork covering embodying my invention.

Referring to Figure 1 there is shown a mould comprising a base plate 2 having a core 3 thereon. A top piece 4 is adapted for vertical movement relative to the base plate 2 to effect compression of the cork particles illustrated as lying within the space 5 which serves in the illustrated embodiment as a filling booth. Surrounding the plate 2 is a jacket 6 having a steam jacketing space 7 therein for the transmission of steam or other heating fluid to maintain the side walls of the space 5 and the base plate 2 at a relatively high temperature. Steam is admitted to the top portion 4 through an inlet 8. The top portion 4 is moved vertically by a ram (not shown) acting through the rod 9.

Steam or other heating fluid entering the top piece through the inlet 8 flows through a number of openings 10 into the interior of the mould, through the cork particles held in compression when the top is lowered, through openings 11 in the base plate 2 and is finally exhausted from the bottom of the jacket through an exhaust 12. Steam is admitted through the inlet 8 only when the top has been lowered to compress the cork, but steam flows in the jacket 6 at such times as are necessary to maintain the desired temperature.

I have found that cork covering exhibits a much closer knit texture on the surfaces exposed directly to the walls of the mould if the walls of the mould are hot when the cork is fed to the mould. The temperature of the mould walls should be in the neighborhood of about 500° F. when the cork is fed in. In this way, a close leathery skin is developed on the cork in contact with the contouring surfaces of the mould. The cork particles in direct contact with the hot walls of the mould are flattened by the heat and pressure, and as a result, I am enabled to produce a cork covering which is readily sealed with a comparatively thin mastic coat.

I also obtain closer conformity with the contouring surfaces of the mould than is obtained in the prior moulding practices wherein cork was fed into a mould and locked therein and baked

Published by AsbestosClaims.Law
asbestosclaims.law/library/22158/2

by externally applied heat. In these former practices, the moulds were filled in the morning and placed to bake. They remained in the ovens for the rest of the day and were drawn from the ovens very early the following morning and permitted to cool prior to a subsequent filling. This was necessary because of the difficulty of handling hot moulds, which handling is necessary where externally applied heat is used for baking. It was also necessary because of the readiness with which the hot cork burned because it retained the readily oxidizable resins, which latter are largely eliminated by my process.

The surfaces of the channels formed in the covering by the core piece 3 also exhibit the fine texture and leathery skin which, coupled with the close dimensional tolerances permissible with my method, contribute to the formation of a cork covering which closely fits the pipe or fitting, requiring no additional filling material to close the space between the covering or the pipe or pipe fitting in ordinary installations as heretofore required, or requiring a very small percentage of the amount of filling material, or "brine putty" which is used on very low temperature installations, due to the absence of pits and voids in the surface and to the absence of any irregularities at the edges.

During the baking, steam of approximately 550° F. and from fifteen to twenty-five pounds pressure is fed at the rate of 600 pounds per hour through the mould for approximately 20 minutes. Such amount of heat applied to the cork is sufficient to distill most of the natural resins from the cork and the steam entrains the vaporized resin and carries it into the bottom portion of the housing. The housing being jacketed, there is no opportunity for the resins to congeal and they are consequently drained off through the exhaust 12. The rate of feeding steam will depend upon the size of the article being baked.

I provide a sealing gasket 13 around the top of the housing to obviate any loss of steam around the top.

Figures 2 and 3 illustrate cork covering made according to my process. In Figure 2 there is shown a covering 14 for an elbow. This covering has a mastic coat 15 on the exterior thereof and a mastic sealing coat 16 on the channel 17 therein for the fitting to be covered. The sealing coating 16 likewise covers the channels 18 for the accommodation of the pipe used in connection with the fitting. It will be noted that the ends of the moulded article are free of mastic. The ends of the cork articles are sharp enough so that two adjacent pieces can be fitted together without any appreciable air space therebetween. A layer of mastic between adjacent pieces is objectionable because such a layer allows direct conduction from the insulated member through the mastic.

The surfaces of the cork covering that are to be left free of mastic are ordinarily sanded. This sanding operation may be omitted without causing any rough uneven edges, but is desirable because it removes the tough leathery skin and exposes surfaces of soft resilient cork. The leathery skin is a material advantage where it is desired to coat the surface of the covering with mastic. However, it is obvious that soft resilient surfaces will form a much more intimate contact with each other than tough leathery surfaces are capable of forming with each other.

In Figure 3 there is shown a cork covering 19 for a straight section of pipe. This covering has a mastic coating 20 on the exterior thereof and a mastic sealing coat 21 on the pipe channel.

It will be noted that the fittings illustrated have a close smooth texture with sharply defined corners and edges. These sharp edges and close texture free from large voids will characterize advantages of my invention.

The cork fed to the mould is preferably ground to a size which will lie on a ⅛" screen and will pass through a ½" screen. This range and size of particles is best adapted for ordinary small fittings. For larger fittings the range may be extended to particles which will pass through a ¾" screen and will lie on a ⅛" screen.

I have found that when the above process is used the cork particles expand more readily and to a greater extent than when any other process is used. Because of the greater expansion of the cork particles as developed by my process, it is not necessary to use as much cork in the manufacture of pipe covering of a given size as was heretofore required. My process enables the production of cork pipe covering having the same volume as cork covering made by prior processes with but 70% of the cork with a density of .7 to .8 pounds per board foot, or stated in terms of volume, a density of 8.4 to 9.6 pounds per cubic foot, whereas, the products of the prior processes referred to seldom were as low as one pound per board foot and not infrequently went as high as 1.2 pounds per board foot.

This saving in raw material, however, does not result in an inferior product. My improved cork covering is comprised of cork particles expanded to a greater extent than was heretofore obtainable, so that the moulded cover is free from voids and fissures. The individual non-communicating cork cells form a closely knit cellular product. At the high baking temperature employed, the softened cork particles conform closely to the contour of the mould. The particles readily adapt themselves to the mould which is hot at the time it is filled so that a perfectly formed cover possessing a leather-like skin and greater insulating value than the shaped covers heretofore available is obtained with less cork per unit volume than was required by the old processes.

The products of prior cork covering processes possess a generally uneven surface with large surface voids and with rough, weak and uneven edges and corners. Cork covering made in closed moulds by the application of external heat resulted in uneven densities in the baked product. The result was warped pieces which had to be sprung or bent to be brought into conformity with the pipe or fitting to be covered. This warping, coupled with the weak uneven surfaces of the pipe or fitting channels resulted in even greater void spaces adjacent the pipe or fitting than were occasioned by the poor tolerance limits possible with such processes. The baking by external heat required practically cold moulds at the time of filling and pressing. This not only reacted to the disadvantage of the surfaces obtainable on the moulded product but actually resulted in more heat being expended to heat the metal than the baked article. The savings effected by my process are therefore not limited to a saving in raw material. There is also a saving in heat; there is also a saving due to the increased insulating value which permits the use of thinner walled coverings for the same temperature differences.

Although, as stated previously, I require but 70% of the volume of cork heretofore required to make the same volume of cork covering, my cov-

ering is 15% more efficient than the covering made by the former processes. This increased efficiency, volume for volume of cork covering, coupled with a saving in raw material and the saving in heat as well as the increased production from a unit mould, all cooperate to make this invention a highly desirable process and product with very appreciable savings and benefits.

Due to the increased efficiency of my improved moulded covering, coverings may be made with thinner walls than has been necessary heretofore and I can, therefore, apply insulation which is much less bulky than that formerly required for the same purposes. This is an important factor where pipes are carried in limited ducts and where space about refrigeration machinery is at a premium.

In my process, the mould is required for only about 20 minutes, whereas in baking processes using externally applied heat, a mould would be required for 24 hours to make one pipe covering. It is readily apparent that my process permits a greater production than was heretofore practicable with materially reduced cost of the finished product. The former processes due to their failure to eliminate the natural and readily oxidizable cork resins frequently resulted in burned or charred surfaces and usually resulted in particularly ragged edges which required filling with plastic material, thus increasing the installation cost.

In the copending application of Arnold R. McCombs, Serial No. 573,832, filed November 9, 1931, there is shown and claimed a moulding apparatus well adapted to carry my process into effect, and the method of making cork insulation is claimed in my copending application, Serial No. 15,043, filed April 6, 1935, as a division of this application.

By the term "pipe fittings" as used in the claims, I intend to include the pipe proper as well as all the pipe joining devices such as elbows, T's, nipples, unions, valves, etc.

While I have illustrated and described the present embodiment of my invention, it will be understood that the invention is not so limited but may be otherwise practiced and embodied within the scope of the following claims.

I claim:

1. A moulded cover for pipe fittings comprising a shaped mass having a substantially plane surface provided with a depressed surface portion adapted to cover a portion of a pipe fitting, said plane surface being engageable with a similar plane of a complementary piece to form a complete insulating cover for said pipe fitting, said mass comprising expanded cork particles substantially free from natural resins, said depressed surface portion having a close-grained, leathery skin, and said plane surface having a soft, resilient face formed of severed cork granules.

2. A moulded cork cover for pipe fittings comprising a shaped mass having a substantially plane surface provided with a depressed surface portion adapted to cover a portion of a pipe fitting, said plane surface being engageable with a similar plane of a complementary piece to form a complete insulating cover for said pipe fitting, said mass comprising expanded cork particles substantially free from natural resins, and having a density of less than 12 pounds per cubic foot, said depressed surface portion having a close-grained skin with a mastic sealing coating thereon, and said plane surface having a soft, resilient face formed of severed cork granules.

3. A moulded cork cover for pipe fittings comprising a shaped mass having a substantially plane surface provided with a depressed surface portion adapted to cover a portion of a pipe fitting, said plane surface being engageable with a similar plane of a complementary piece to form a complete insulating cover for said pipe fitting and having plane end portions adapted to contact adjacent insulating covers, said mass comprising expanded cork particles substantially free from natural resins, said depressed surface portion having a moulded, close-grained, leathery skin and said plane surface portions having a soft, resilient face formed of severed cork granules.

4. A moulded cover for pipe fittings comprising a shaped mass having a substantially plane surface provided with a depressed surface portion adapted to cover a portion of a pipe fitting, said plane surface being engageable with a similar plane of a complementary piece to form a complete insulating cover for said pipe fitting, said mass comprising expanded cork particles substantially free from natural resins, and having a density of approximately 9.6 pounds per cubic foot, said depressed surface portion having a close-grained, leathery skin and said plane surface having a soft, resilient face formed of severed cork granules, the lines of juncture where the depressed portion meets the plane surface being sharp and well defined.

5. A moulded cork cover for pipe fittings comprising a shaped mass having a substantially plane surface provided with a depressed surface portion adapted to cover a portion of a pipe fitting, said plane surface being engageable with a similar plane of a complementary piece to form a complete insulating cover for said pipe fitting and having plane end portions adapted to contact adjacent insulating covers, said mass comprising expanded cork particles substantially free from natural resins, said plane surface portions having a soft, resilient face formed of severed cork granules and the remaining surface portions having a moulded, close-grained, leathery skin coated with a mastic.

LOUIS R. LEE.