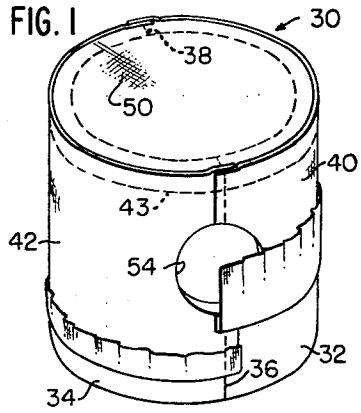
July 17, 1962 W. C. JACOBSEN 3,044,915

METHOD AND APPLIANCE FOR HEAT INSULATION

Filed Dec. 12, 1958

FIG. 1



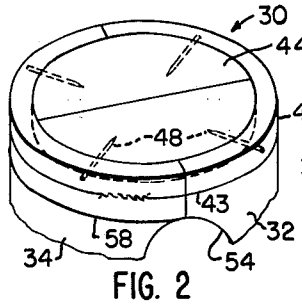
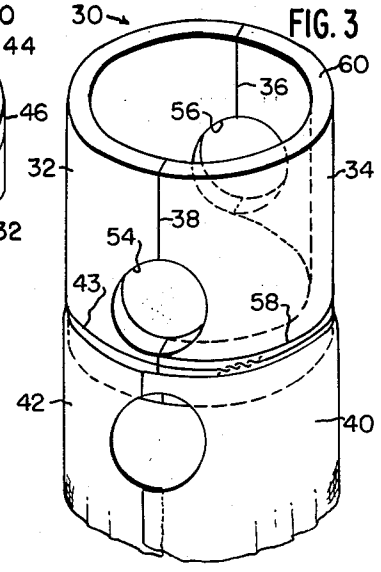


FIG. 2

FIG. 3



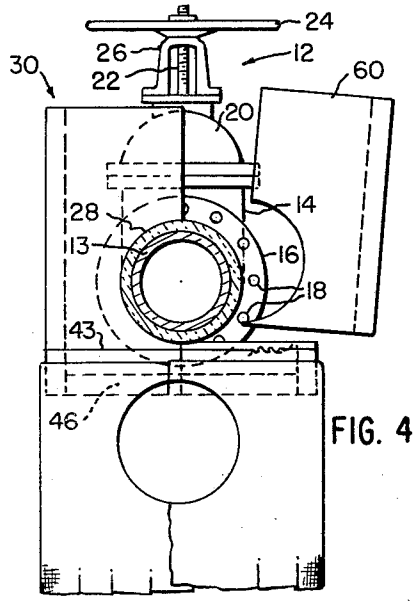
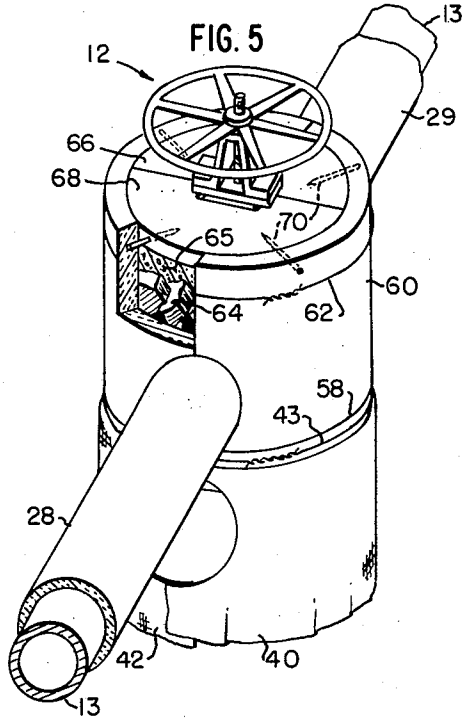


FIG. 4

FIG. 5



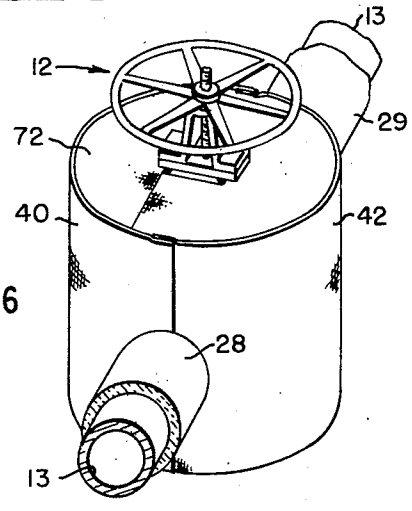


FIG. 6

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METHOD AND APPLIANCE FOR HEAT INSULATION

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1 Claim. (Cl. 154—44)

The present invention relates generally to the art of insulating fluid circulating systems. More particularly, it concerns a method and appliance for insulating irregular-shaped portions of a circulating system such as valves, T's, joints and the like.

In systems for circulating heated fluid it is commonly desired to cover all parts with a specified thickness of insulation. In conventional practice the lengths of pipe which have no lateral protuberances are easily covered by lengths of fitted two-piece pipe covering of molded asbestos composition. Each of the two pieces is of semi-cylindrical form with uniform wall thickness. The pieces are held together by lengths of wire or metal tape wrapped around them at spaced intervals, and canvas fabrics are pasted over each covering piece for a finished appearance and for protection of the asbestos material.

The simplicity of this method for covering the pipes is sharply contrasted with the conventional method of insulating valves, T's, flanges, joints, unions or other irregular-shaped appurtenances connected to the pipes. These parts have lateral protuberances which prevent covering them in the foregoing manner. Accordingly, each valve, for example, is covered by a laborious process performed by hand on the job using flat sheets of asbestos composition. These sheets are cut to size, scored or grooved to permit them to be rounded to fit over the various parts of the valve, and wired in place. Then asbestos cement composition is applied to the gaps and cracks between the pieces to achieve a firm structure, regular outline and neat appearance. The proper insulation of a valve by this method requires considerable skill and time, which may be measured in hours in the case of the larger valve sizes. Moreover, the covering is so constructed that, if repair work on the valve should be required at any time, it would be necessary to destroy the valve covering beyond salvage in order to gain the necessary access. Thus an expensive replacement is required each time the valve is serviced.

It is a principal object of this invention to provide a method and appliance for heat insulation which substantially reduce the labor required on the job to fabricate a covering for parts having lateral protuberances such as valves and the like.

A second object is to provide a method which is adapted to utilize readily available materials which may be assembled in a prefabricated appliance, thereby reducing the installation time substantially below that which is common in the art at present.

A further object is to provide a covering that can be easily removed to permit access to the covered part, and replaced after servicing is completed.

With the foregoing and other objects in view, the principal feature of this invention resides in a novel method which utilizes a prefabricated appliance, whereby a covering sized to the particular valve or other appurtenance may be readily applied with a minimum number of steps to be performed by the applicator on the job.

A second feature resides in the provision of a method whereby coverings of uniform, regular dimensions and neat appearance may be utilized throughout a fluid-circulation system.

Other features of the invention reside in certain details of the method and appliance which will become evident

from the following description thereof, having reference to the appended drawings illustrating the covering of a valve. The valve is taken as one example of an appurtenance to which the invention is applicable.

In the drawings,

FIG. 1 is a view in perspective illustrating a prefabricated valve covering according to the invention, prior to its application to a valve, with the closed end up;

FIGS. 2 and 3 are detail views in perspective illustrating portions of the prefabricated valve covering of FIG. 1, FIG. 2 showing the closed end up and FIG. 3 showing the closed end down;

FIG. 4 is a side elevation illustrating the method of assembling the prefabricated covering to a valve;

FIG. 5 is a view in perspective illustrating subsequent steps in the application of the valve covering; and

FIG. 6 is a view in perspective illustrating a completely applied valve covering according to the invention.

Referring first to FIG. 4, there is illustrated a valve of conventional form designated generally at 12 and having a body portion 14. Connected to the valve are two coaxial pipes 13. The body 14 has two opposite flanges 16 having bolt holes 18 for attachment to the adjacent pipe ends, a bonnet 20 for housing the valve parts, a valve stem 22, a wheel 24 threaded on the stem, and a standard 26 secured to the bonnet 20 and providing an upper bearing support for the stem 22. It will be understood that the illustrated valve is of representative form and includes certain lateral protuberances and irregularities found in conventional valves. However, the invention obviously finds application to valves or appurtenances of other shapes as well.

Prior to insulating the valve, conventional pipe coverings 28 and 29 are applied to the pipes 13 as described above, bringing the ends of the coverings as close to the flanges 16 as possible.

To apply a covering to the valve 12 according to this invention, I employ a prefabricated unit designated generally at 30 in FIGS. 1 to 3. In manufacturing this unit for supply to the trade, I obtain pipe coverings having sufficient inside clearances to enclose the flanges 16 on the valve and any other protuberances therefrom. In the illustrated form I use a conventional cylindrical pipe covering comprising semi-cylindrical parts 32 and 34 abutting along diametrically-opposed longitudinal joints 36 and 38 and covered by canvas pieces 40 and 42, each of which overlaps both of the joints 36 and 38. The longitudinal dimension to which the parts 32 and 34 are cut is illustrated in FIG. 4. When assembled on the valve these parts extend downwardly below the flanges 16 by approximately the thickness of one of the parts 32 or 34 and upwardly to a point immediately below the standard 26. Beneath the canvas pieces 40 and 42, the parts 32 and 34 are held together by a length of wire 43 wrapped around them, the wire being twisted and covered with a layer of asbestos composition cement.

One or more pieces of flat sheet material of the same composition as the parts 32 and 34 form a closed end for the prefabricated covering, this end being illustrated in (FIG. 2) as comprising semi-circular pieces 44 and 46, by way of example. The pieces 44 and 46 are fastened flush with one end of the assembled parts 32 and 34 by skewers 48 of wood or any other suitable stiff material capable of withstanding the temperatures encountered in use.

A canvas end cover 50 is pasted over the above assembly with its edge folded down over the parts 32 and 34; and the canvas pieces 40 and 42 are pasted over the edge of the covering 50, all as illustrated in the upper portion of FIG. 1.

The pieces of cover fabric 40 and 42 and the parts 32

and 34 also have transverse circular holes 54 and 56 cut therethrough in diametrically-opposed relationship. Diameters of these holes are in coincidence with the joints 36 and 38, respectively, and are substantially equal to the outside diameters of the pipe coverings 28 and 29 (FIG. 4). The part 34 is sawn transversely along a line 58 intersecting the holes 54 and 56 and preferably tangential to the bottoms thereof, thereby severing a portion 60 from the rest of the assembly. As supplied, the assembly 30 has the pieces of fabric 40 and 42 pasted over the entire outer surfaces of the parts 40 and 42.

The prefabricated appliance as described above has the general appearance of a unitary, hollow, canvas-covered cylinder closed at one end. The closed end comprises the end of the valve covering which will be opposite to the valve stem 22 in the final assembly. The valve stem may take any direction, either vertically or horizontally, according to the requirements of the system and the valve location.

The manner of assembling the valve covering to the valve is illustrated in FIGS. 4 to 6. The first step is to peel the pieces of fabric 40 and 42 down to the positions shown in FIG. 3. The assembly is then fitted in position on the valve with the portion 60 removed and with the pipe coverings 28 and 29 within the spaces provided by the holes 54 and 56. Preferably, a quantity of high temperature cement is spread around the portions of the pipe coverings 28 and 29 that are engaged by the parts 32 and 34 at the holes 54 and 56. While the assembly is supported in this position the portion 60 is replaced, preferably with a layer of cement spread along the line 58, and a length of wire 62 is wrapped about the assembly, twisted securely as illustrated in FIG. 5, and covered with a layer of asbestos composition cement.

The next step preferably consists in dropping loose, broken pieces 64 of insulation material into the top of the assembly. These pieces may be scraps of the same composition as the pieces 32, 34, 44, and 46. They are tamped lightly and wedged about the body 14 of the valve, the bonnet 20, and the flanges 16. They provide additional insulation as well as giving internal support to the valve covering by distributing its weight to the parts of the valve and helping to hold the covering in fixed position on the valve. The pieces 64 are added until they reach a height which leaves a small clearance below the upper rim of the assembly, the clearance being somewhat greater than the thickness of the pipe covering material. A quantity of asbestos cement 65 is poured into the top of the assembly, and this cement seeps down between the pieces 64, eventually solidifying and bonding them together and to the valve and covering to create a firm, strong structure.

As an alternative to the use of the pieces 64 and the cement 65, I may simply pour a quantity of loose, dry cement in powdered or comminuted form into the top of the assembly until the same level is reached.

Pieces 66 and 68 of the same asbestos composition sheet material as the pieces 44 and 46 and of generally semicircular shape are then cut for the top of the cover, leaving a central opening for the standard 26. These pieces are tamped down flush with the parts 32 and 34 as shown in FIG. 5. The tamping is preferably done while the cement 65 is still pliable, and acts to compress and wedge the filling pieces 64 more tightly against the valve. When the valve is in the illustrated position with the stem 22 directed upwardly, these pieces require no further fastening. However, if the stem is oriented in any direction which places on them a component of weight outwardly in the direction of the axis of the stem, skewers 70 may be fastened into them in the same manner as the skewers 48 (FIG. 2).

Additional insulating cement is also applied around the outside of the holes 54 and 56, if necessary, to create a tight fit with the pipe coverings 28 and 29. The same cement is then spread across the entire top of the assembly, and a circular piece of canvas 72 (FIG. 6) is cut out and fitted over the top of the valve covering and smoothed down over the edge, as illustrated.

Finally, a suitable paste such as wheat paste is spread over all exposed portions of the wall of the valve covering, and the pieces 40 and 42 are replaced.

It will be seen that the resulting valve covering is of plain cylindrical outside shape, the dimensions being fixed by the prefabricated assembly illustrated in FIG. 1 from which it is made.

The appearance is neat and the structure is firm, providing the desired thickness of insulation at all points around the valve, the thickness being not less than that of the parts 32 and 34. Additional effective insulation is provided by the broken pieces 64 and the cement 65 interspersed between and covering the pieces 64. A minimum of time and effort is required to make the necessary assembly to the valve.

Because of the unique features of this method of covering the valve, it is possible to realize a saving in the cost of servicing the valve after it has been covered. This saving results from the possibility of removing the covering without damaging it. The removal procedure simply consists in peeling down the fabric pieces 40 and 42, removing the fabric piece 72, cutting the wire 62, removing the piece 60 from the assembly, and breaking up the cement 65 and pieces 64, which are then exposed, sufficiently to permit removal of the rest of the covering intact from the valve. After the valve has been serviced, the original covering can be replaced by the procedure described above.

It will be understood that the method herein described will find application to the covering of various appurtenances to a fluid circulating system other than valves, such as joints, T's, unions and the like. In fact it is possible to use this method to cover nearly every appurtenance which has fittings for a pair of substantially coaxial pipes, such as the pipes 13, whether or not it is desired to have a part such as the illustrated wheel 12 extending outside the covering. The most economical size of covering in any case is that which has the smallest inside diameter that will contain the particular appurtenance.

It will be further understood that while this method has been described with reference to the use of a prefabricated structure 30 made from conventional cylindrical pipe coverings, the teachings of this invention are not limited to a prefabricated unit of any particular external shape, so long as the requisite internal clearances are provided. Thus, instead of having a circular cross section, the prefabricated structure may have a square or rectangular cross section, and such latter shapes are particularly economical for the larger sizes of valves and appurtenances. In any case, the method of assembly of the covering is the same in all essential respects as that described above.

It will also be understood that certain modifications and variations of the structure and method herein described may be accomplished in accordance with skills known to those familiar with this art, without departing from the spirit or scope of the invention.

Having thus described the invention, I claim:

A prefabricated insulator for a fluid valve of the type having a body with pipe connections coaxially situated in a first axis and a valve stem extending from the body in a second axis at right angles to the first axis, said insulator comprising a hollow body of uniform cross section along an axis to coincide with the second axis, said body being self-supporting and being comprised essentially of a heat insulating material of uniform wall thickness, said body further having an open end to receive said stem, a closed end to be situated on the side of said body opposite to the stem, and a pair of wall openings to be situated in the first axis to receive said pipe connections, said body further having a removable wall portion defined by a line of severance passing through said wall thickness and extending from said open end

to one of said wall openings, thence to the other of said wall openings and thence back to said open end, said line of severance being located to permit attachment of the insulator when separated from the removable wall portion to a valve having its pipe connectors then attached to pipes.

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