

UNITED STATES PATENT OFFICE.

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METHOD OF AFFIXING MANUFACTURED ASBESTUS.

SPECIFICATION forming part of Letters Patent No. 483,560, dated October 4, 1892.

Application filed February 28, 1891. Serial No. 383,267. (Specimens.)

To all whom it may concern:

Be it known that I, FREDERICK W. JAQUI, Jr., a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in the Method of Affixing Manufactured Asbestos; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

Asbestos in its various manufactured forms is a well-known non-conductor of heat and cold, as well as a perfect electrical insulator, but when made up in the form of a sheet or roll of paper, cloth, sheathing, felt, or board, or the like, as commonly found in the market, no means have heretofore been known of attaching it permanently to steam, hot-water, air, or hot-air pipes or to cold or hot pipes of any kind or to round, flat, or other surfaces without securing it with wire or other artificial means to keep it in place. Various efforts have been made to adhere it to metal and other surfaces—such as wood, earthenware, and the like—by one kind or another of paste, glue, cement, or other sticky or adhesive material or substance, but always without avail for the reason that such substance or substances, being thickened, unavoidably solidify and harden when they become dry, and hence crack and loosen the asbestos covering. For these reasons no adhesive substance as such and applied in a more or less liquefied condition has been discovered which will serve for fixing the asbestos permanently on any form or quality of material, and hence the artisan has been compelled to resort to some kind of artificial means—such as wire or its equivalent—to bind and hold it in place. I have discovered that such wrapping can be dispensed with and the asbestos paper or cloth made to adhere to plain metallic surfaces without such wrapping and without employing anything of an adhesive nature having the quality of sticking and binding the material in position; and my process consists in first saturating the asbestos material in water or its equivalent, hot or cold, until the paper, cloth, felt, sheathing, or roll is filled with moisture, as it would be by immersing it in a water bath. In doing this the air will

be expelled, as is evidenced by the air-bubbles that form on its surface as the water penetrates to the inside. When this immersion has been completed and the material sufficiently saturated, which occurs almost instantly upon putting it into the water or applying the water thereto as it is spread upon a table, it is at once applied to the pipe, tube, wire, or other article it is to cover or insulate and smoothed down by a gentle pressure, which will expel or drive out all the air between the paper or cloth and the surface covered. The paper or cloth is first cut to size and shape as needed, so that when put in place the edges will exactly match and a neat perfect job be produced. Nothing more than this is required, and the paper or cloth so placed in position will remain in place indefinitely and requires nothing else to hold it in place. It is, in fact, as firmly held as would be possible by the closest and most careful wire wrapping, and will withstand any degree of heat or of cold without showing any effect whatever. It will also withstand the shaking and jarring arising from operating machinery without becoming loosened and is practically as firmly in position as if it formed a part of the surface it envelops or covers. I have also found that electric wires may be successfully insulated in this way for long or short distances, and it is good where any kind of insulator or non-conductor of heat, cold, or electric current is desired.

In wrapping a wire, pipe, tube, or the like the ends or edges of the paper or cloth may overlap and yet be so evenly smoothed down as not to show or separate.

It will not do to merely wet one side of the paper or cloth, because then it will not serve the purpose, but must be wet through from side to side. Of course if the material be very thin care should be taken that it be not so completely soaked as to be liable to tear in handling. The theory upon which this result is obtained is not material to this consideration, and different theories may be set up; but it is well known that asbestos paper is so dense as not to be penetrable by air or as to exclude the admission of air. Hence having the air upon its inner surface expelled by the use of the water, so that no air remains between the paper and the metal when

the paper has been evenly and closely smoothed down on the metal or other material, when the water or moisture evaporates it would seem as though the vacuum thus created were filled by the paper itself and that this may be the reason why the paper remains so firmly in position. At any rate, whatever may be the correct theory or explanation, the fact remains that such permanent adhesion does flow from the method or process of putting on the asbestos as I have herein described and that, so far as I am aware, the process and result are new and essentially useful. Not only is there a great saving in the time required to put the material in position, but a very material saving in the matter of wrapping with wire or the like heretofore found indispensable.

I have said that water alone is employed for the saturation. Nothing else is required and nothing that I am aware of will serve a better purpose; but of course the invention covers saturation by anything which is the equivalent of water—say, for example, milk or water containing, possibly, some slight admixture of some kind which, however, would not harden and form a crust like glue or paste and which would practically leave the conditions the same as if pure water were used.

The character of the metal, whether it be iron, copper, tin, brass, or other metal, is not material and the paper is as readily secured upon one metal as another. Of those named tin would ordinarily be the more difficult to attach to, because it seems naturally to have an oily or greasy surface; but by my process I can wrap a tin tube as successfully as any other kind, and this I regard as the severest test to which the invention can be applied.

As before said, however, the form or outline or nature of the material covered is immaterial, as the asbestos will adhere equally well on all forms of surfaces and on all kinds of

material. It may also be secured in place by first wrapping it on the article covered, as a wire rod or the like to be insulated, and then moistening through to the inside and then pressing and smoothing down, so as to expel the air and make close contact, as before.

Experience has also shown that where it is convenient it is better to heat the surface to be covered—say as pipes leading to a radiator or register would be heated—before applying the asbestos, as it seems to adhere better, if possible, when so adhered than to cold surfaces.

I do not limit myself in the use of the asbestos as herein described, but claim the use and application of the same wherever it may be found useful in or through the medium of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The method herein described of applying manufactured asbestos for insulating purposes, the same consisting in saturating the asbestos in water or its equivalent and while wet pressing it upon the surface covered thereby, so as to cause it to lie closely and evenly upon the same, substantially as described.

2. The method of covering metallic or other surfaces with asbestos paper, cloth, or the like, which consists in thoroughly moistening the asbestos with a liquid which has no adhesive ingredients and then spreading the paper or cloth on the surface to be covered and finally pressing it closely and evenly upon the same, substantially as described.

Witness my hand to the foregoing specification this 26th day of February, 1891.

FREDERICK W. JAQUI, JR.

Witnesses:

H. T. FISHER,
N. L. McLANE.