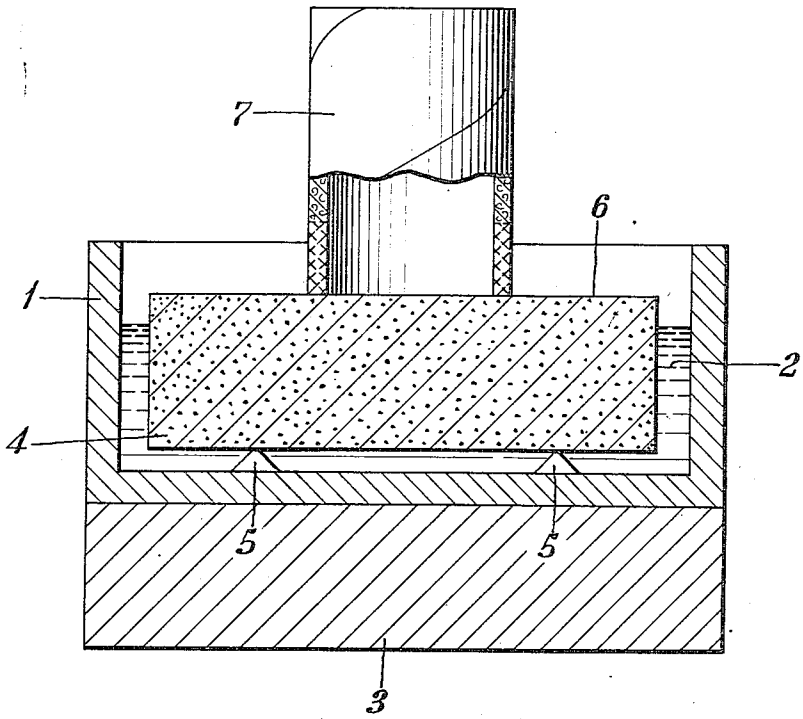
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METHOD OF IMPREGNATION WITH ABSORBENT CARBON APPLICATOR

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METHOD OF IMPREGNATION WITH ABSORBENT CARBON APPLICATOR

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1 Claim. (Cl. 117—112)

This invention relates to a method of impregnating porous substances or articles with impregnants which are liquids above room temperature.

More particularly, this invention relates to a method of impregnating porous articles with impregnants which are liquids above room temperature at a controllable rate and in a controllable amount by means of the capillary action of a thermally-conductive, inert, porous solid.

It is often desired to impregnate certain porous articles with impregnants which are liquids above room temperature, for example, to impregnate cardboard, paper, or other fibrous or porous materials with wax. A satisfactory method in the example cited would find wide application in the field of containers, such as cardboard mailing tubes, dry cell covers, and the like, where it is desired to crimp the ends in order to maintain a curl, particularly under humid conditions. The obvious method of impregnation is simply to dip the article into a bath of the molten impregnant, but the disadvantages are likewise obvious, the difficulty of achieving uniformity of impregnation, an excess of the impregnant on the surface of such article and the lack of control over rate and amount of impregnation, to mention a few.

The principal object of this invention is to provide a method of impregnating a porous fibrous article, for example, a cardboard tube, or the like, with impregnants which are liquids above room temperature at a controllable rate and in a controllable amount.

The means whereby the method of the invention is achieved comprise utilizing the capillary action of a thermally-conductive, inert body of porous carbon or porous metal placed in a container of molten impregnant, whereby the impregnant is drawn to the exposed surface of such body and the porous or fibrous article to be impregnated is placed in contact with such exposed surface, capillary action drawing the impregnant from such exposed surface into the porous or fibrous article.

The accompanying drawing is a schematic representation of a suitable apparatus whereby the object of this invention may be achieved, that of impregnating a porous or fibrous article with impregnants which are liquids above room temperature, by utilizing the capillary action of a thermally-conductive, inert, body of porous carbon or porous metal placed in a container of molten impregnant and placing in contact with the exposed surface of such body the article to be impregnated, capillary action drawing the impregnant into the article.

In the accompanying drawing:

A container 1 of any any suitable material, containing molten impregnant 2, is placed on a heater 3 to maintain the molten impregnant 2 at the desired temperature. The heater 3 may be a conventional electric hot-plate, or any other suitable means of supplying heat. The thermally-conductive porous carbon or porous metal block 4 is placed in the container 1, leaving exposed the desired portion of the carbon or metal block 4 above the level of the molten impregnant 2. Standoffs 5 are provided at the bottom of the container 1 on which the carbon or metal block 4 rests in order to permit circulation of the molten impregnant 2 and to preclude heat transfer directly to the carbon or metal block 4. On the surface 6 of the carbon or metal block 4 is placed the object to be impregnated 7.

A preferred method of impregnation according to the invention is set forth as follows:

An open vessel containing microcrystalline wax, in this case that available under the trade designation of Sunoco #5825, is placed on a heater and a carbon block 1 to 2 inches thick with an effective porosity of 48% (average pore diameter 0.0039 inch, 99 microns), having a substantially flat upper surface, is placed in the molten wax so that approximately one-eighth inch to three-eighth inch of the block is left exposed and heat is maintained to provide a surface temperature of 110° C. to 135° C. on the carbon block. The object to be impregnated, in this case a spiral-wound cardboard tube of approximately one and one-half inches diameter, wall thickness approximately 0.03 inch, is placed upright on the carbon block, no pressure being necessary, for a period of time dependent on the height of wax impregnation desired.

According to the method of this invention the rate and amount of impregnation of porous articles may be varied and controlled by the use of different degrees of porosity of the thermally-conductive porous block, the temperature of its exposed surface and the height of the exposed surface above the level of the molten impregnant.

When reference is made herein to capillary action it is intended to apply both to the capillary action that causes the impregnant to rise to the exposed surface of the thermally-conductive, inert, porous block, and also to the capillary action that causes the impregnant to rise from the block into the porous article placed in contact therewith.

Although the preferred method of the invention as set forth herein is of impregnating a cardboard tube with wax, it will be understood that the method of the invention may be utilized with impregnants other than wax, and articles other than cardboard tubes, all coming within the scope of the invention. Any impregnant may be used as long as it has the property of rising by capillary action to the surface of the porous block and into the porous article or substance placed in contact therewith.

What is claimed is:

A method of impregnating at least the end portions of a cardboard dry-cell cover with wax by utilizing the capillary action of a thermally-conductive porous carbon block, which comprises bringing said end portions of said cardboard dry-cell cover in contact with the exposed upper surface of said thermally-conductive porous carbon block; maintaining the lower unexposed part of said thermally-conductive porous carbon block on stand-off points in a bath of molten microcrystalline wax; maintaining the surface of said bath of molten microcrystalline wax at a temperature range of about 110° C. to about 140° C.; while maintaining said contact of said end portions of said cardboard dry-cell cover with said exposed upper surface of said thermally-conductive porous carbon block for a period of time sufficient to impregnate at least the said end portions of said cardboard dry cell cover with said molten microcrystalline wax.

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