UNITED STATES PATENT OFFICE.

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WALL-BOARD.

1,248,181. Specification of Letters Patent. Patented Nov. 27, 1917.

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To all whom it may concern:

Be it known that I, BENJAMIN WILSON SIDWELL, Jr., a citizen of the United States, and resident of Buffalo, county of Erie, and State of New York, have invented certain new and useful Improvements in Wall-Boards; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to wall board suitable for use in place of lumber for lining chicken houses, stables, dairy barns, and the like, and serves not only as a sheathing to keep the buildings warm in winter and cool in summer, but it is impregnated with a vermin repellent of a kind particularly advantageous for these requirements.

The board is made up from wood pulp fiber, either ground or cooked, waste paper or chemical pulp, or mixtures of these, and is marketed in substantially rigid sheets 24 to 36 inches wide, and in lengths of 4, 5, 6, 7, 8 and 9 feet to meet all requirements with very little cutting. These boards are ordinarily made out of several plies cemented together, and are smooth, sanitary, easily kept clean, and for use in chicken houses, stables, dairy barns, and the like, can be nailed direct to joists and studding or furred to brick or concrete walls. The board has good insulating properties and keeps the quarters warm and comfortable, and in addition to the disinfecting qualities arising from its chemical impregnation, as hereinafter explained in detail, it contributes to good sanitation because of its smooth surface and freedom from cracks and imperfections.

In accordance with the present invention, the wall boards may be constructed out of wood fiber sheets cemented together, as disclosed in United States patent to Lewis, No. 1,063,941, using the particular kind of wood fiber desired, and when the sheets are thus assembled into a composite board, or even during the process of assembly, the board is impregnated at least on one or both faces, by painting, soaking, or by means of a suitable arrangement of rolls, with a vermin repellent which derives its odor and disinfectant qualities largely from its phenol-like constituents.

The vermin-proofing material which I prefer to use for treating both faces of the board, consists of creosote material, 50 parts by volume, and asphaltum thinned with naphtha to 30 to 35° Be'., 50 parts by volume, to which has been added a caustic, say caustic soda, in such quantity that it may unite with part, say 90% of the phenol in the mixture, to form a soluble alkaline phenolate. The exact percentage of caustic is not vital so long as an excess is not added.

When, for example, caustic soda is added to the creosote and asphaltum materials, it reacts with the phenol like constituents to form sodium phenolate and water, according to the following reaction:

$$C_6H_5OH+NaOH=C_6H_5ONa+H_2O.$$

This sodium phenolate is an unstable compound which will break down under the action of carbonic acid gas and moisture.

In the ordinary course of the manufacture and marketing of these boards, they are built up and impregnated at the mill and cut to the various marketable lengths, and then placed in piles at the mill and at distributing warehouses much as lumber is piled in a lumber yard. With the wall boards thus stored in piles, or in bundles, the distinfectant is not only physically prevented from escaping, but is chemically bound in the form of sodium phenolate, so long as there is no considerable contact with the air. But when the panels are sold and are fastened to the wall, where their surface is exposed to the air, the phenol, which is not chemically combined, begins to slowly leave the board. And then, as the sodium phenolate is attacked by the ever present but small percentage of carbonic acid and moisture constituents of the air, it begins to break down, forming normal and acid carbonates of sodium and slowly liberating the phenol according to one or both of the following reactions:

$$2C_6H_5ONa+CO_2+H_2O=2C_6H_5OH+Na_2CO_3$$

$$C_6H_5ONa+CO_2+H_2O=C_6H_5OH+NaHCO_3$$

In this way the board remains effective and useful for a long time as a distinfecting agent and a vermin repellent.

Inasmuch as the alkali combines with a part only of the phenol bodies present, there

remains from the outset sufficient free phenol to give to the board the desired vermin-repellent qualities, and the phenol which leaves the board slowly in use is continually replaced by phenol set free from the phenolate by the carbon dioxid and moisture of the air. The board thus possesses both active and latent vermin-repelling constituents while the latent constituents are of a nature adapted to become active upon use of the board for its intended purposes.

It is furthermore of advantage to combine the phenolic bodies and phenolates with a diluent which will also serve as a thickener and which, in use, will act as a retarding agent to prevent too free disengagement of the phenol and to cause this disengagement to take place over a long period of time and at a slow rate. Thus, in the composition above described, the creosote material is mixed with asphaltum thinned with naphtha and the creosote is thus diluted and its distribution within the board correspondingly modified. The asphaltum serves as a modifying and retarding agent making the free phenolic bodies less active and more prolonged in their action and correspondingly modifying the phenolates so that the setting free of phenol is restrained and modified and the action also prolonged over a long period of time. The asphaltum also aids in giving a brown color to the board.

While I have given above a composition which has proved satisfactory for the treatment of wall boards as described, I am aware that variations may be made in the composition, as in the character of the thinner or the particular quality of the creosote material or of the asphaltic material, without destroying the effectiveness of the disinfecting agencies, and I contemplate such changes in the product as are within the spirit of my invention as defined by the appended claims.

I claim:—

1. A wall board impregnated with a composition containing free phenolic bodies, alkali phenolates, and a thickening and retarding agent.

2. A wall board carrying sodium phenolate which is in unstable condition and adapted to break down and yield phenol on exposure to air carrying normal quantities of carbonic acid gas and moisture.

3. A wall board impregnated with a mixture of creosote and thinned asphaltum to which an alkali has been added to combine with but a part of the phenol, substantially as described.

4. A wall board having its face impregnated with approximately equal parts creosote and asphaltum to which an alkali has been added to combine with some at least of the phenol and form an unstable compound capable of breaking down under the action of moist carbonic acid.

In testimony whereof I affix my signature.

BENJAMIN WILSON SIDWELL, JR.