J. H. THICKENS.

WATERPROOFED WALL BOARD.

APPLICATION FILED DEC. 5, 1914.

1,191,099. Patented July 11, 1916.

Fig. 1,

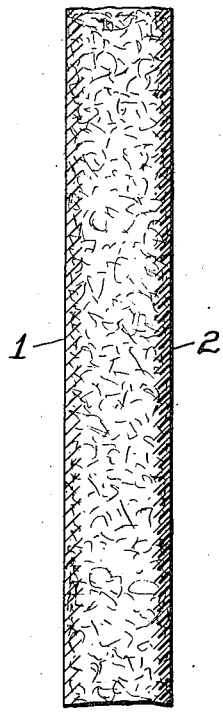
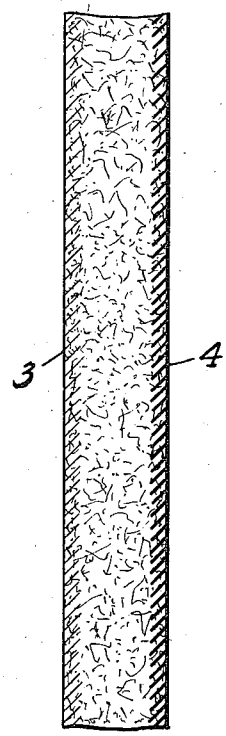


Fig. 2,



INVENTOR

John H. Thickens

BY

Edward B. Marvin.

ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN H. THICKENS, OF BUFFALO, NEW YORK, ASSIGNOR TO THE BEAVER COMPANY, OF BUFFALO, NEW YORK, A CORPORATION OF OHIO.

WATERPROOFED WALL-BOARD.

1,191,099. Specification of Letters Patent. Patented July 11, 1916.

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To all whom it may concern:

Be it known that I, JOHN H. THICKENS, a citizen of the United States, residing at Buffalo, county of Erie, State of New York, have invented certain new and useful Improvements in Waterproofed Wall-Board; and I 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 and aims particularly to prevent warping and bulging of the board during use.

Wall board may be made from wood fiber or wood pulp, either ground wood pulp waste paper or cooked pulp, used alone or intermixed, and ordinarily is marketed in substantially rigid sheets 4 to 16 feet long and 24 to 72 inches wide, and of a thickness approximating ¼ of an inch. The wall board may consist of a single layer of material or of a plurality of plies pasted or cemented together. Generally it is used as a building material by nailing or tacking it directly to the studding of a room, so that it may serve in place of lath and plaster as the inner wall of the room, being ornamented with paint or the like as desired.

The wall board, as manufactured, contains a certain percentage of moisture, and also has the characteristic of changing in its moisture content in accordance with the humidity of the surrounding air, these changes ordinarily being slow but nevertheless appreciable.

It is the object of the present invention to so limit and regulate the changes in moisture content in wall board while in use that the progressive shrinking or swelling of the board shall not result in appreciable warping or bulging, and this result is attained by giving to the board, as manufactured, an unequal or differential sizing on its front and back sides, so that when installed in the place where it is to be used, the exposed or front face can be coated with paint, or the like, thereby bringing the moisture repelling power of the front side up to that of the back side, leaving the wall board ultimately in such condition that the two sides are uniform in their power to take on or give off moisture.

More particularly, it is the object of the present invention to apply to the back side of the wall board more waxy material than is applied to the front face, this difference being regulated to correspond roughly with the protective action of paint as ordinarily applied to the front face of such boards for decorative purposes. It is possible to secure the excess of waxy material on the back side of the board by applying to that side a heavier coating of the size, but in the preferred embodiment the sizing used for the back is richer in waxy material, so that a greater protection is secured even though the quantity of size be not materially greater than that applied to the front.

The details of the present invention, together with further objects and advantages, will become clear from the following detailed description, taken in conjunction with the accompanying diagrammatic drawings, wherein—

Figure 1 is a section of a sheet of wall board sized on both sides, and with an additional sizing on the back; and Fig. 2 is a modification.

The sizing to be used in accordance with the present invention may vary in composition, but for wall board of wood pulp fiber as now ordinarily manufactured, the following composition is satisfactory for the front face of the product:

Resin	37%
Wax	16%
Solvent	47%

The wax may be paraffin or its equivalent, and as a volatile solvent I prefer to use naphtha.

The following has been found very satisfactory for the back of the board:

Resin	32%
Wax	25%
Solvent	43%

Changes in the composition may be made with advantage to correspond with different kinds of stock and the extent to which the boards are to be water-proofed, and when the percentage of wax is high, the moisture-proof coating is more effective than with lower percentages of wax. But it is impossible to use a very large percentage of wax on the front of the board, because of the fact that the painting which must be done on this surface is liable thereby to be streaked and to flake off in course of time. Not only is it advisable to use a different

composition of material on the back of the panel, but a larger quantity can be employed advantageously, for while good results can be obtained by using the same composition for the face and back (by greatly increasing the quantity on the back and using a composition not too high in wax), better results are obtained by using on the back, a composition richer in wax and applying it in larger quantity than on the front.

When very large quantities of size are employed, the board is run through a bath having a composition which is suitable for the face of the board. It is allowed to remain in this bath for a period of time sufficient to permit absorption of the desired quantity of size, after which it is passed through squeeze rolls where the excess adhering to the surface is squeezed off. The board is then passed through coating rolls which put an additional and preferably richer coat on the back but leave the front as it was. Fig. 1 illustrates such a board, wherein the sizing at the front 1 is indicated by the shading lines and the corresponding and simultaneously applied sizing on the back 2 is indicated by similar lines, and wherein the additional and heavier shading lines at the back indicate the additional and preferably richer coat subsequently put on. When only a small quantity of size is to be applied, the board may be passed through sizing apparatus consisting of two rolls, one of which is immersed in a solution for the back of the board, and to the other of which is attached a trough into which size suitable for the face is pumped, and by which the size for the face is applied simultaneously with the application of the richer size to the back. The excess from the roll which applies the size to the face runs back into a storage chamber of its own and does not become mixed with the richer material being applied to the back of the board. Considerable pressure is employed between the two rolls so that a good penetration and uniform coating is secured. Fig. 2 illustrates such a board wherein the sizing for the front 3 is indicated by the lines of shading and the simultaneously applied sizing for the back 4 is shown with heavier shading to indicate its greater richness in wax or its equivalent.

Where all of the size is of the same composition and is applied to the back in greater quantity than to the front, or is of different composition with a greater wax content for the back, or is a combination of these two, (that is, a richer mixture for the back and also applied in greater quantity), there will result a board water-proofed in differential manner with more waxy material on the back than on the front, and, therefore, more resistant at the back to the penetration of moisture into the board or for the escape of moisture from the board. The progressive changes in moisture content in a board so coated are slow enough to permit commercial marketing of the board without serious warping or bulging, and after the board has been installed in a building, as by permanent attachment to the studding with nails, or in other suitable manner, the coatings of paint, or the like, ordinarily applied to the face of the board for purposes of ornamentation, bring up the moisture repelling character of the front face so that it substantially equals that of the back face, and thereafter throughout years of use, the front and back faces of the board will work together in transmitting moisture to or from the inner part of the board, and neither face will preponderate over the other to an extent sufficient to cause detrimental bulging or warping of the board. It may slowly shrink as the natural moisture in the board leaves it, and it may slowly expand with prolonged humid atmospheric conditions, but the lines of expansion and contraction lie in the plane of the board, and will be taken care of at the points of attachment to the studding, and the lateral deformations which have heretofore been so troublesome with wall board are thus in large measure remedied.

I claim:

1. A rigid wall board of wood fiber, sized on the back more than on the front, so that the subsequent decoration of the board may equalize the resistance to moisture of both sides of the board and reduce warping due to unequal expansion.

2. A wall board of wood pulp, sized on both the front and back sides, the sizing on the back being more resistant to moisture than the sizing on the front, so that when the board is installed and decorated, it will present substantially equal resistance to moisture on both sides.

3. A wall board of wood pulp, sized on both the front and back sides, the sizing on the back containing more waxy material than that on the front, so that the subsequent decoration of the board may equalize the resistance to moisture of both sides of the board; substantially as described.

4. A rigid wall board of wood fiber coated on the front with a sizing of about 37% resin, 16% wax and 47% solvent, and coated on the back with a sizing of about 32% resin, 25% wax and 43% solvent; substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

JOHN H. THICKENS.

Witnesses:
N. B. O'Brien,
R. G. Kroeden.