Aug. 12, 1930. F. J. GRISWOLD 1,772,483

PLASTER BOARD

Filed July 10, 1926 2 Sheets-Sheet 1

Fig. 1

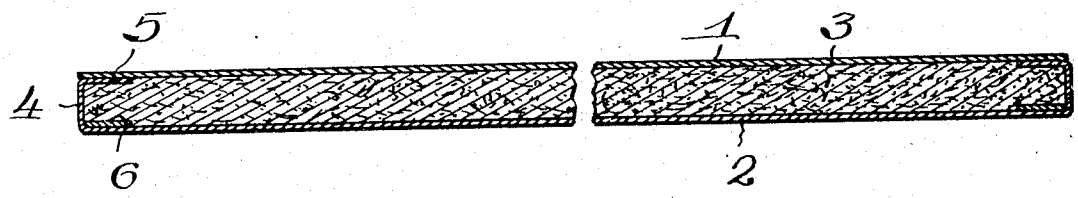
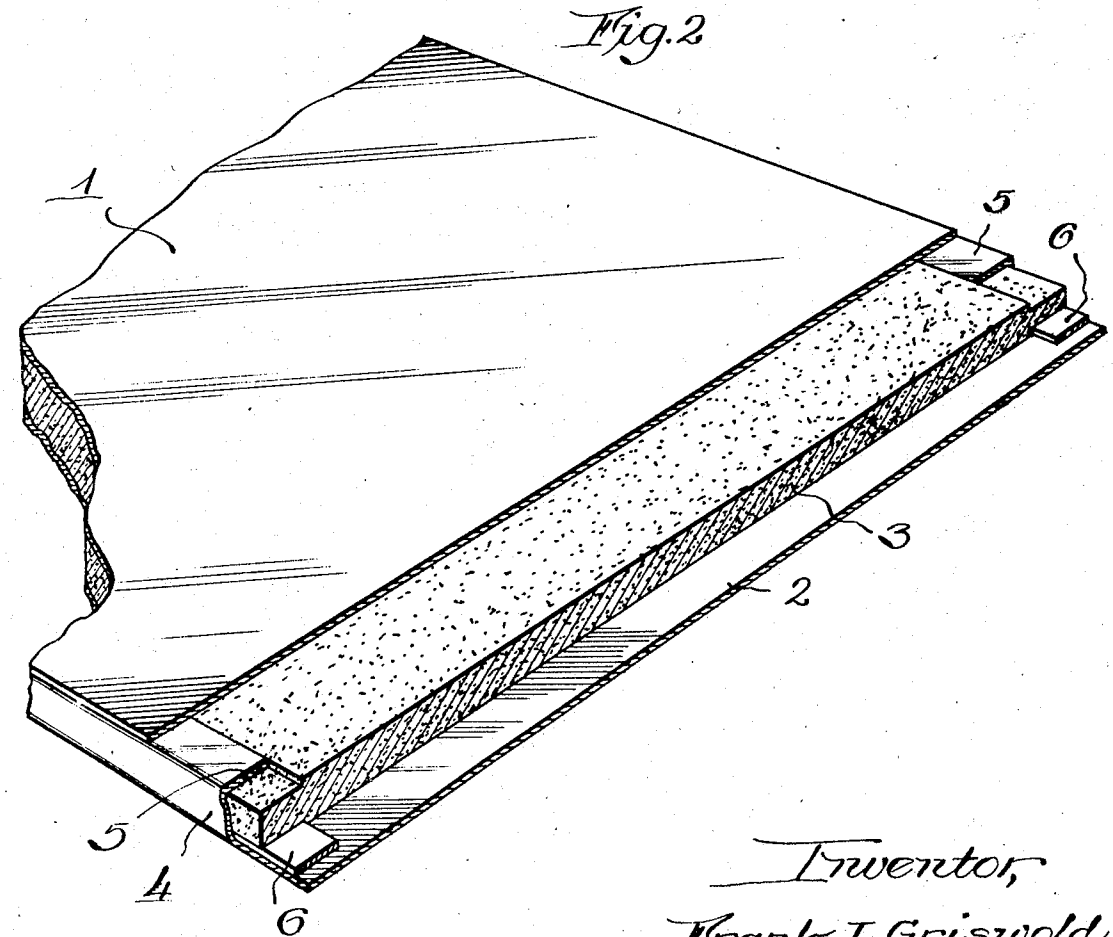


Fig. 2



Witness:
Chas. L. Kourek.

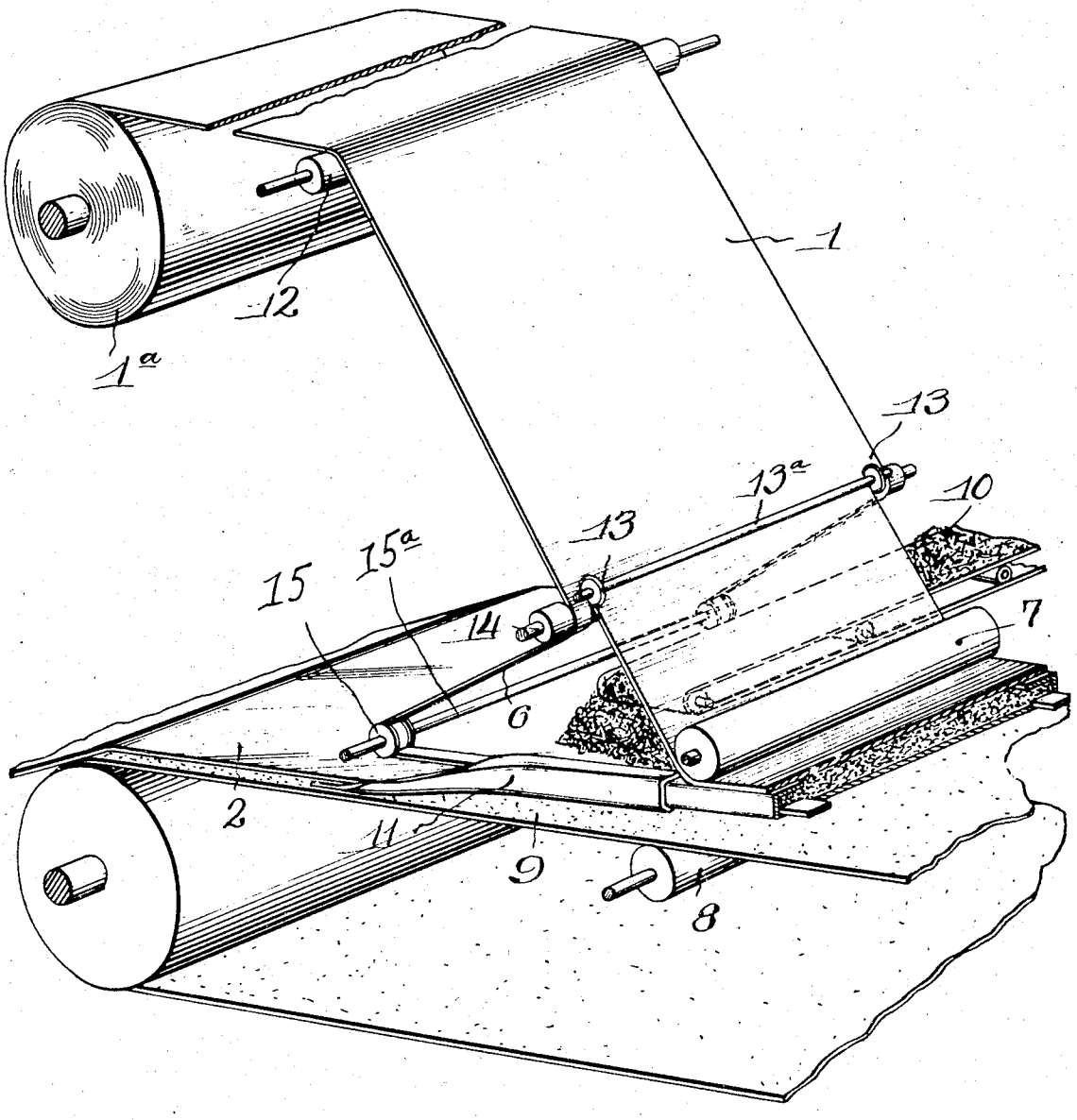
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PLASTER BOARD

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Fig. 3



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UNITED STATES PATENT OFFICE

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PLASTER BOARD

Application filed July 10, 1926. Serial No. 121,541.

This invention relates to improvements in plaster board and more particularly to a novel method of making plaster board having its side edges covered with paper.

Plaster board is a well known material used for building purposes, and particularly in the finishing of walls and ceilings. Plaster board or wall-board as it is sometimes called, consists generally of a layer of plaster or stucco, superimposed between covering sheets of paper of a suitable grade. Various methods have been devised for protecting the side edges of the board, one of the more common methods being that of folding the margins of one of the covering sheets over the side edges of the plaster body and thence over or under the other covering sheet on the opposite face of the board and in sealing contact therewith.

This folding and sealing process is carried out during the manufacture of the product by a continuous process machine, whereby the covering sheets are fed from rolls of paper toward a pair of pressure rolls at one end of the machine, wet plaster or stucco being fed onto the bottom sheet and the margins thereof folded upwardly and inwardly just prior to the passage of the materials between the rolls.

The object of the present invention is to provide an improved construction for a plaster board having a covered edge formed after the manner above set forth, but embodying certain novel features, calculated to produce several advantageous results not existing in the product now on the market, and hereinafter to be pointed out.

A further object of the invention is to provide a new and novel process of manufacturing plaster board to embody the structural features herein disclosed.

Referring to the accompanying drawings.

Figure 1 is a cross sectional view of the board.

Figure 2 is a perspective view of the board with portions of the paper covering sheets broken away at one end to show more clearly the construction.

Figure 3 is a diagrammatic view showing the manner in which the board would be manufactured by the continuous process.

Considering the plaster board in its finished form, the same is made approximately 3/8 of an inch in thickness, this being the standard, although it may be made of greater or less thickness if desired. In width the board may vary from 32 inches to 48 inches, and in length from 3 feet to 10 feet. In the larger lengths, the material is usually known as wall-board, and is applied the full height of the wall, serving as a substitute for both plaster and finishing layer of plaster.

Although in the present form either face may be considered as the top or outer face, for convenience of description the portions will be referred to as they appear in the drawings. Thus the board may be said to consist generally of a top covering sheet 1, a bottom covering sheet 2, and an intermediate layer, or thickness of plaster and stucco 3. The top sheet 1 extends the full width of the board, its edges coinciding substantially with the side faces or edges thereof. The bottom sheet 2 is considerably wider than the top sheet, since its marginal portions are bent or folded, first upwardly over the side faces of the body, forming the edge covering 4, and then over upon the top face of the body 3, under the margins of the top sheets, forming an underlapping marginal strip 5. In the manufacturing process as will hereinafter appear, the bottom sheet is folded over or around the edge, with an approximation to square corners, and the top sheet laid on afterwards, the two lapping surfaces of the sheets being preferably secured together, either with glue or other adhesive, or simply by a film of the plaster, which may be forced between the surfaces in the process of manufacture.

In addition to the folding of the bottom sheet, around the side edges a narrow strip of paper 6, 6 is laid along the edges of the bottom sheet with their outer edges abutting against the transverse edge covering portions 4, 4, or as nearly so as possible. These strips are preferably 3/4 of an inch or more in width, but preferably equal in width to the underlapping portions 5, 5, extending along

the top edge of the board. These strips 6, 6 in the process of manufacture presently to be described, are trimmed from the edges of the top sheet, and then fed onto the bottom sheet, to occupy the position described.

There are several advantageous features of this construction which are noted at this point: In the plaster board of this general form the additional strips 6, 6 are omitted, thus providing only three plies of paper along the edges through which the nails are driven in applying the board to the wall. One of the desirable features of plaster board is what is called a strong nailing edge, that is, one that will withstand the driving of nails without cracking or being damaged by the blows of the hammer. The paper being tough is a protection against breakage, and therefore the additional strips serve to reinforce the edges and provide a much stronger nailing edge, due to the four plies of paper.

Another advantage of the present type of edge is the fact that the top sheet 1 comes to the edge of the board with its edges flush with the side faces thereof. In the manufacture of ordinary folded edge board, it is necessary to space the edges of the top sheet back from the side edges of the board from ½ to ¾ of an inch, this due to the fact that in the continuous process it is difficult to prevent the top sheet from weaving side wise as it advances toward and onto the top surface of the board. As a consequence therefore, it has been necessary to use paper somewhat narrower than the width of the board for the top sheet, in order to give the required spacing back of the edges and to thus compensate for this weaving tendency in the feeding of the paper and the consequent protruding of the top sheet edges beyond the side edges of the board at some points, thus leaving them rough and irregular.

The foregoing reference to the common practice of using a top sheet of narrower width than the board itself, suggests a further disadvantage in the usual method of manufacture which is obviated by the method therein disclosed, namely, the use of different widths of paper for the top and bottom sheets. This is obvious since the bottom sheet must have sufficient excess width to provide the marginal portions which are folded around the edges.

By use of the present method of manufacture both top and bottom sheets may be of the same width, the excess width being trimmed from the top sheet and introduced into the board as the reinforcing strips 6. The use of sheets of the same width simplifies the process of manufacture inasmuch as only one width or size of paper need be carried in stock, instead of two widths, as is now necessary. Of course it is contemplated that more or less weaving of the top sheet will be experienced in the continuous process by which the plaster board of the present invention is made, but the effects of the weaving is minimized to a negligible consideration by trimming the edges of the top sheet immediately in advance of the point where it is applied to the bottom sheet so that any inequalization in width is taken up in the strips and not in the transverse disposition of the top sheet. This manifestly will bring about some variation in the width of the strips, but not enough to interfere with their function as reinforcing the edges and providing the four ply nailing edge.

In describing the process by which this plaster board is made, reference is made to Figures 3 in which has been illustrated the parts which perform the essential steps in the continuous process of manufacture, although no attempt has been made to show the process in full detail.

The process is carried out on a machine consisting generally of an endless travelling belt, the board being formed at one end of the belt and discharged at the other, sufficient time elapsing during its travel on the belt for the wet plaster to set. As the material reaches the end of the belt it is cut to length, and then introduced into driers or kilns, which removes the moisture and produces the finished product.

At the head end of the machine (here shown) are located the paper and plaster feeding mechanism. The top and bottom sheets 1 and 2 are fed from large rolls such as 1^a over series of guide rollers to a point just in advance of a pair of pressure rolls 7 and 8 located above and below the travelling belt 9, with a space between the top face of the belt and the upper roll 7, equal to the required thickness of the board. The bottom sheet 2 is usually fed onto the belt more nearly horizontally, whereas the top sheet is fed downwardly from above at an angle. The wet plaster being discharged onto the advancing bottom sheet immediately in front of the pressure rolls by means of a belt conveyor 10, extending from one side of the machine to a point midway between the edges of the sheets and in front of the pressure rolls. Suitable folding devices 11, 11 are also located in advance of the pressure rolls, which pick up and fold over the edges of the bottom sheet, just before the top sheet is applied, so that as the materials go between the pressure rolls they are simultaneously assembled and reduced to the uniform thickness of the finished product.

Thus in Figure 3, the top sheet 1 is shown as being advanced downwardly and forwardly at an angle of say 45° from the roll 1^a positioned at some point above and to the rear of the machine proper, passing over a guide roll 12, thence downwardly and around the top pressure roll 7, and finally horizontally

and forwardly as a part of the board. In the path of the top sheet 1 and just in advance of and above the pressure rolls are located a pair of rotary cutters 13, 13, mounted on a shaft 13ª, driven in any suitable manner. These cutters are preferably located on the outer or upper side of the sheet, and immediately adjacent a guide roll 14, suitably grooved to coact with the cutters to sever the paper as it passes between them. Manifestly these cutters are spaced apart a distance equal to the width of the board, and are positioned in the vertical plane of the side edges thereof. Moreover the cutters are located as close to the pressure rolls as practicable, so that any weaving between these two points will have little or no effect on the disposition of the edges of the top sheet along the edges of the board.

Assuming that the top sheet is of the same width as the bottom sheet, these cutters trim the edges, removing from each side narrow ribbon like strips, which are the strips 6, 6 in the finished board. These strips are preferably lead rearwardly and downwardly from the cutter roll 14, to flanged guide rollers 15, positioned just above the advancing bottom sheet and to the rear of the folding devices 11. From these latter guide rollers which are mounted on a free turning shaft 15ª, the strips are fed forwardly with the advancing bottom sheet in flatwise contact therewith, and at a predetermined distance inwardly from the extreme edges, so that they will lie along the side edges, after the bottom sheet has been turned upwardly and over the edges of the plaster body, on emerging from between the pressure rolls. If necessary, suitable tension devices may be used so that a certain amount of slack can be maintained in the strip material as it is fed from the points of cutting into the board, although this would not ordinarily be necessary, since the top and bottom sheets travel at the same rate of speed.

Thus to complete the process after the strips are laid onto the advancing bottom sheet the plaster is continuously discharged onto this sheet and spread laterally as the margins of the sheet are being folded upwardly and over to enclose the plaster. The top sheet 1 is applied as the bottom sheet passes between the pressure rolls, and from which the board emerges in the completed product of uniform thickness, and from thence transported on the belt to give the plaster time to set before it is cut and dried.

It is also contemplated that the strip material severed from the edges may be wound onto reels and thence into the board in the same manner as already disclosed. Such an arrangement would require the periodic shifting of reels from one set of spindles on which the empty reels are filled, to others from which the filled reels are unwound as the material is fed into the board. This arrangement, however, would not be as convenient, since it would require frequent changing of reels, although under some circumstances might be desirable.

The process of manufacture otherwise conforms to the standard practice, in fact the only essential departure is that of trimming of the top sheet and the introducing of trimmed material into the board in the manner herein set forth. Manifestly the process may be modified somewhat in actual practice, but the essential features are present, namely, the trimming of the top sheet at a point quite close to the pressure rolls, so that any intermediate weaving of the paper will have little or no tendency to displace the sheet laterally, and the feeding of these strips onto the edges of the bottom sheet and at a distance inwardly from its edges so that they will lie along the covered side faces of the board, substantially as shown in Figures 1 and 2.

It is also to be understood that these reinforcing strips may be wider than the corresponding lapping portion 5 of the bottom sheet, this being particularly true where the initial width of both sheets is the same, since the strips 6 will then be equal to the combined widths of the end covering portion 4 and the lapping portion 5 of the bottom sheet.

Having therefore disclosed the product embodying the invention and a method by which those skilled in the art will be enabled to practice the invention, I claim:

1. A process of making plaster board consisting of advancing sheets of covering material, trimming the marginal portions of the material from the edge of one of said sheets as it is being advanced, feeding the trimmed material onto the adjacent surface of the other sheet and inwardly from the edges thereof, feeding plaster onto said last mentioned sheet, and folding the marginal portions thereof to enclose the edges of the plaster adjacent said trimmed material.

2. A process of making plaster board, consisting of advancing sheets of covering material, trimming a marginal portion from one edge of said sheets as it is being advanced, guiding the material trimmed from said sheet into flatwise contact with the surface of the other sheet, and introducing plaster between said sheets.

3. A process of making plaster board consisting of advancing sheets of covering material, trimming marginal portions from the side edges of one of said sheets thereby reducing the same to a predetermined width less than that of the other sheet, introducing plaster between the advancing sheets, feeding the material trimmed from said first mentioned sheet onto the untrimmed sheet adjacent its edges, and folding the marginal portions of said untrimmed sheet to enclose the edges of the plaster and the trimmed material.

4. A process of making plaster board consisting of advancing top and bottom sheets of covering material, trimming the marginal portions of said top sheet to the width of the plaster board to be made, feeding plaster in its wet state onto said bottom sheet, guiding the material trimmed from said top sheet flatwise onto the advancing bottom sheet and along parallel lines spaced inwardly from the edges thereof, introducing plaster between said sheets and folding the marginal portions of said bottom sheet beyond said trimmed material upwardly and over upon the plaster.

5. A process of making plaster board consisting of advancing top and bottom sheets of covering material of substantially the same width, trimming the edges of one of said sheets as it is being advanced to reduce the same to substantially the width of the plaster board to be made, advancing the material trimmed from the top sheet onto the bottom sheet adjacent its edges, introducing a body of wet plaster between the advancing sheets and folding the marginal portions of said bottom sheet to enclose the side edges of said body adjacent the outer edges of said trimmed material.

6. The process of making plaster board consisting of advancing top and bottom sheets of covering material, trimming the marginal portions from the side edges of said top sheet, guiding the material trimmed from said top sheet from the point of trimming downwardly and thence forwardly into flatwise contact with the bottom sheet inwardly from the edges thereof, feeding plaster onto said bottom sheet in its wet state and folding the marginal portion of said bottom sheet upwardly and over the plaster in lapping engagement with the edges of the top sheet.

7. A process of making plaster board consisting of advancing top and bottom sheets of covering material of substantially the same width toward pressure rolls, trimming the edges of the advancing top sheet to the width of the plaster board to be made at a point immediately in advance of said pressure rolls, guiding the material trimmed from the edges of the top sheet downwardly into the plane of the top surface of the bottom sheet, introducing plaster in its wet state onto the advancing bottom sheet, folding the marginal portions of said bottom sheet upwardly and over to enclose the side edges of the plaster and applying the top sheet to the plaster as the same is advanced between the pressure rolls.

Signed at Port Clinton, Ohio, this 3rd day of July, 1926.

FRANK J. GRISWOLD.