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PLASTER BOARD FACED WITH LIGHTWEIGHT PAPER

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Fig. 1.

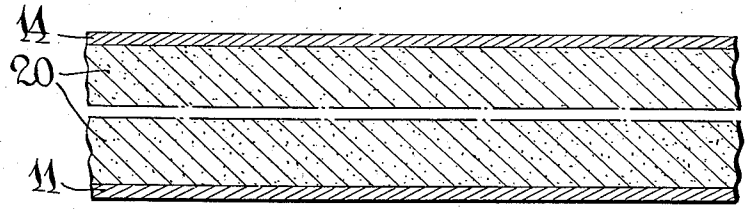
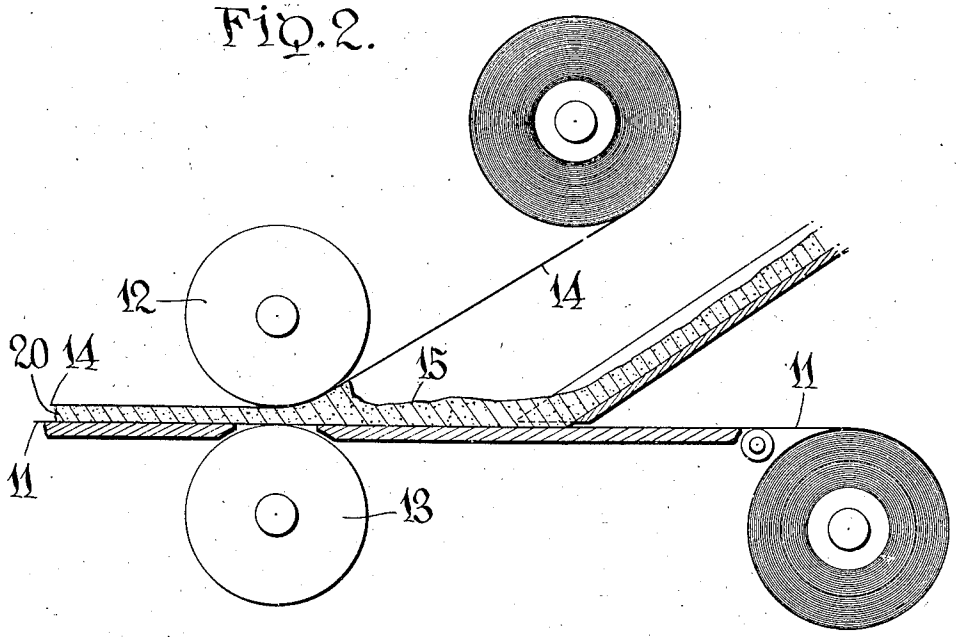


Fig. 2.



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PLASTERBOARD FACED WITH LIGHT-WEIGHT PAPER

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5 Claims. (Cl. 154—45.9)

The present invention relates to an improved plaster board and more particularly a plaster board in which the core of set cementitious material is faced with lightweight paper having relatively high crosswise strength and relatively high porosity.

In the manufacture of wall board from cementitious materials, such as calcined gypsum, it has been the practice heretofore to prepare a mix of calcined gypsum and water and to run this mix between upper and lower facing sheets producing, upon setting or crystallization of the calcined gypsum, a wall board or plaster board having a set core with facing sheets enclosing the core and bonded thereto in order to decrease the frangibility of the cementitious core.

Due to the fact that these facing paper sheets possess a greater lengthwise than crosswise strength and are fed lengthwise of the board making machine, the crosswise strength of the board with the paper facing sheet attached is less than the lengthwise strength. It has been general practice, therefore, to provide a facing paper having a crosswise strength of at least 25 pounds per square inch as determined on Standard Scott tensile strength machine in order to produce set plaster board that is sufficiently resistant to fracture to be employed for usual purposes of such wall board.

It has been the general practice to employ, as facing sheets for gypsum lath, the weakest type of gypsum wall board, paper made of so-called chip stock made on a cylinder machine and having a weight of about 62 pounds per thousand square feet of paper and a thickness of about 0.020 inch in order to obtain paper possessing the requisite 25 pounds crosswise strength. Such paper, since it is made on a cylinder machine, possesses a lengthwise strength, that is, strength measured in the machine direction, of about 80 pounds, a figure much higher than is necessary to produce satisfactory board. Such a paper produces a gypsum lath which when tested by procedure well known in the industry and outlined in Federal Specification SS W 51 A will have a transverse strength lengthwise with the fibers of approximately 100 pounds and crosswise of 40 pounds. Thinner and lighter paper made of kraft stock has not been found satisfactory as facing sheets due to the tendency of the paper to pull away from the board and form corrugations and due to difficulty encountered in drying the finished board.

It is obvious that the wide difference between the two directional strengths accomplishes no satisfactory results. Therefore it is advantageous to produce and employ a facing sheet on which the crosswise strength is maintained up to, or is superior to, the present acceptable minimum. This is accomplished, in accordance with the present invention, by the use of a Fourdrinier sheet made at 55 pounds lengthwise and 35 pounds crosswise strength which produces a lath possessing a crosswise strength of 50–55 pounds and a lengthwise strength of 75–80 pounds.

Recently suggestions have been made to use combinations of plies of chip and kraft paper in order to obtain a facing sheet with the requisite crosswise strength and having a unit weight considerably below the 62 pounds normally employed. However, since such paper is made in plies it is subject to the disadvantage of all cylinder paper, namely, to split and separate into the constituent lamellae.

It is an object of the present invention to provide a wall board faced with paper of a weight considerably below that heretofore thought necessary to provide the requisite crosswise strength and which is not subject to splitting into plies.

It is a further object of the invention to provide a wall board faced with paper made of combined chip and kraft stock and having sufficient porosity to permit of efficient and rapid drying.

In the drawing:

Fig. 1 is an enlarged sectional view of wall board of the present invention, and

Fig. 2 shows the forming end of a wall board machine and illustrates diagrammatically the feed of the plastic core between facing sheets.

In accordance with the present invention a cementitious mix is prepared in a conventional way from calcined gypsum and water to which may be added, if desired, paper pulp, starch and foaming ingredients, all as is well known in the art. The cementitious mix is thereafter fed between the improved facing sheet, more fully described hereinafter, possessing a crosswise strength of about 30 to 35 pounds and a lengthwise strength of about 52 to 57 pounds or higher, the paper having a weight of about 38 to 45 pounds per thousand square feet and a caliper of 0.015 to 0.016 inch.

The assemblage of the cementitious mix 15 and upper and lower facing sheets 14 and 11, respectively, is run through master rolls 12 and 13 set to form the board to the proper width and thickness and then is passed along a runway until the core 20 is set whereupon the board is cut to the length desired and fed to a conventional drying

oven where the excess free water not combined as water crystallization is removed.

The product thus formed is a wall board or plaster board having a crosswise strength equivalent to that made from calcined gypsum and water and faced with 62 pound chip paper of a caliper of 0.019 to 0.020, board that has been found eminently satisfactory in industrial uses.

The paper employed as facing sheets 11 and 14 for the plaster core 20 is advantageously prepared from about 30 to 50% by weight of chip fibers which may be obtained from waste newspaper stock, and the like, and about 50 to 70% by weight of kraft fibers. This stock is prepared in the usual way in suitable breaker beaters, deckers, and finish beaters to which latter the appropriate amount of size, alum and coloring, if desired, may be added and the fiber-water ratio adjusted prior to feeding the stock to the head box of a conventional Fourdrinier machine. Sufficient stock is run under the slice bar to the wire of the Fourdrinier machine to produce a finished paper of about 40 pounds per thousand square feet in weight and having a caliper of about 0.016". Upon test this paper is found to possess a minimum crosswise strength of about 32 pounds and a lengthwise strength (machine direction) of about 55 pounds. Since the paper is made on a Fourdrinier machine it is not formed as individual plies but represents one single ply not subject to splitting.

Paper made of this composition on a Fourdrinier machine is especially suitable for facing sheets for wall board since the paper is relatively porous and due to the low caliper permits of more rapid drying of the completed wall board in the kiln. The increased rate of drying will become apparent when it is understood that the improved facing paper shows a 20 second densometer test, that is 100 c. c. of air under a constant specified pressure will flow through the paper sheet in 20 seconds as contrasted with a 90 second densometer test for normal chip sheets made on a cylinder machine.

From the above it will be seen that the present invention provides a plaster board that is faced with a type of paper which will not separate into plies when the board is scored preparatory to breaking as is usual on the job, one which does not scuff easily and one which will not pull away into lamellae upon withdrawal of the cutting knife of the board machine.

It will further be seen that the porosity of the paper permits of more rapid drying of the board and therefore of an increase of the machine speed with consequent greater production from a given machine.

What is claimed is:

1. Wall board comprising a set cementitious core and a paper sheet bonded to one face of the core, said sheet comprising paper of the Fourdrinier type of a pulp composition comprising about 30–50% chip stock and about 50–70% kraft stock by weight and having a weight of 35 to 45 pounds per thousand square feet, a crosswise strength of about 28–35 pounds and a densometer test of in the neighborhood of 20 seconds.

2. Wall board comprising a set cementitious core and a paper sheet bonded to one face of the core, said sheet comprising paper of the Fourdrinier type and having a weight of 35 to 45 pounds per thousand square feet, a crosswise strength of about 28 to 35 pounds and a composition of mixed kraft and chip stock producing a densometer test of in the neighborhood of 20 seconds.

3. Wall board comprising a set cementitious core and a paper sheet bonded to one face of the core, said sheet comprising paper of the Fourdrinier type of a pulp composition comprising about 30–50% chip stock and about 50–70% kraft stock by weight and having a crosswise strength of above 28 pounds and a weight of 35 to 45 pounds per thousand square feet.

4. Wall board comprising a set cementitious core and a paper sheet bonded to one face of the core, said sheet comprising paper of a pulp composition comprising about 30–50% chip stock and about 50–70% kraft stock by weight and having a crosswise strength of about 28–35 pounds and a thickness of about 0.015 to 0.016 inch.

5. Wall board comprising a set cementitious core and a paper sheet bonded to one face of the core, said sheet comprising paper of a pulp composition comprising about 30–50% chip stock and about 50–70% kraft stock by weight producing a densometer test in the neighborhood of 20 seconds, said paper sheet having a weight of 35 to 45 pounds per thousand square feet, a crosswise strength of 28–35 pounds and a thickness of about 0.015 to 0.016 inch.

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