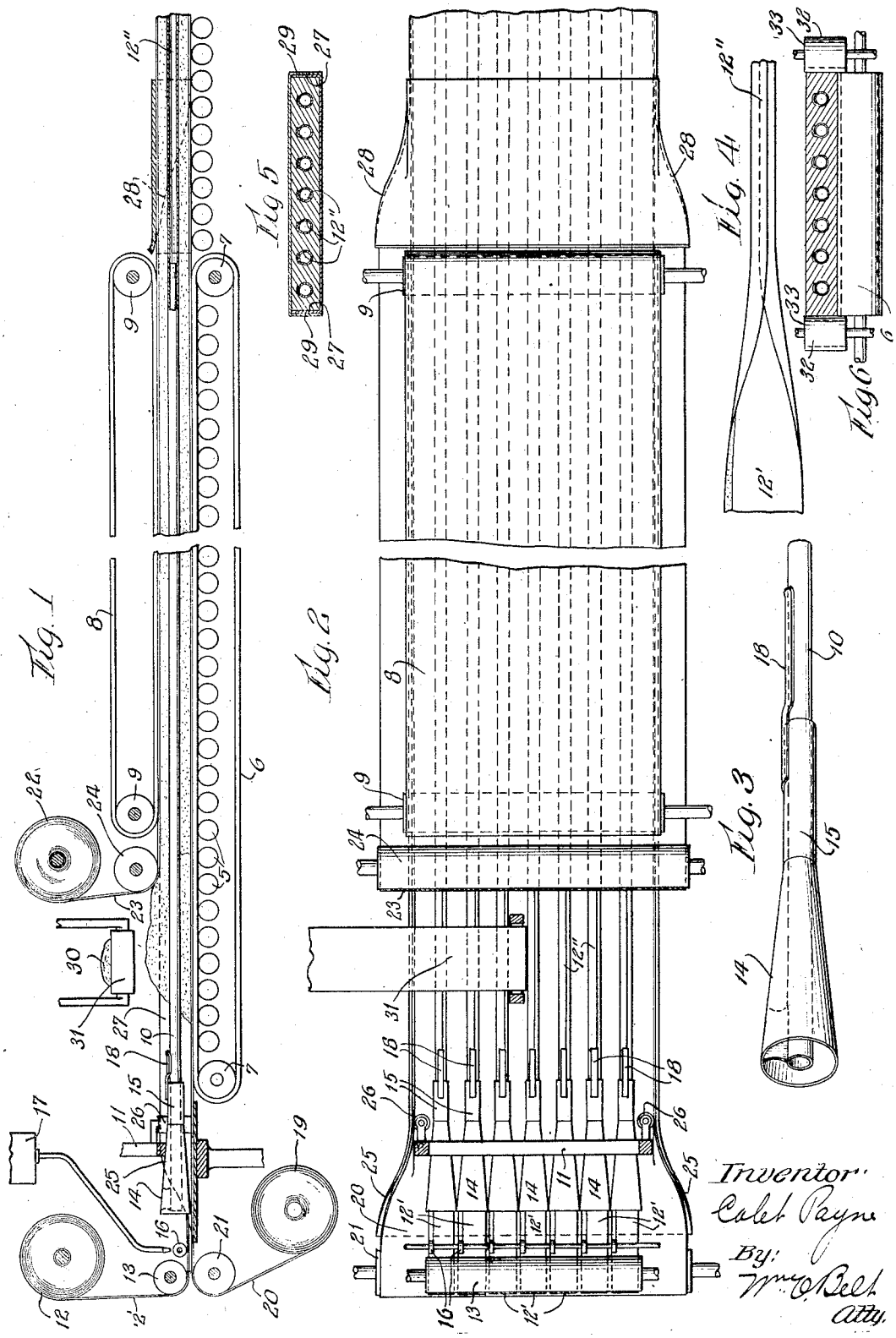
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METHOD AND APPARATUS FOR MAKING WALL BOARD

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CALEB PAYNE, OF CHICAGO, ILLINOIS, ASSIGNOR TO GYPSUM ENGINEERING & MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

METHOD AND APPARATUS FOR MAKING WALL BOARD.

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This invention relates to the manufacture of a structural material which I call "wall board" to take the place of partition blocks and plaster board. The wall board is made of a hydrated cementitious material which I refer to generally as "stucco", reinforced and strengthened in accordance with my invention and generally enclosed in a paper covering. And while it is intended for such structural and other uses to which partition blocks and plaster board are now employed, it is superior to partition blocks because it can be made in sections of greater width and length and of less thickness; it is more economical to install; and it should reduce the cost of manufacture. It is superior to plaster board because it has greater strength and rigidity than plaster board and does not require studding or other means for supporting it.

The wall board, as an article of manufacture, has a plurality of openings extending longitudinally therein and lined with paper or other suitable material in tubular form, which reinforces and strengthens the body of the wall board, and this forms the subject matter of my companion application, Serial No. 693,527, filed February 18, 1924.

The object of the invention is to make wall board for use as a structural material and with longitudinally extending openings therein in a simple and economical manner, as a continuous operation, and in such predetermined width and thickness as may be required.

Another object of the invention is to provide a hollow core for forming each of the openings in the wall board and preferably to remain therein as a permanent part of the wall board.

And a further object of the invention is to reinforce and strengthen the wall board by the provision of a reinforcement in the longitudinal openings of the wall board and which is preferably bonded to the walls of the openings.

In the accompanying drawings, I have illustrated an apparatus which can be employed for carrying out my improved method, and referring thereto,

Fig. 1 is an elevation, partly in section.

Fig. 2 is a plan view, partly in section.

Fig. 3 is a detail view of a former for making the tubular reinforcement.

Fig. 4 illustrates the way the reinforcement is made.

Fig. 5 is a transverse sectional view of the wall-board.

Fig. 6 is a similar view illustrating another embodiment of the invention.

A roller bed 5 is supported in a suitable manner, and a belt 6 travels over the rolls 7 and over a portion of the roller bed. Another belt 8 travels over rolls 9 above the belt 6. A plurality of mandrels 10 are mounted in a frame 11 and they project forward between the belts 6 and 8, being spaced apart in a predetermined manner, which may vary as conditions will require. A plurality of rolls 12 carrying a supply of strip paper or other suitable material are supported preferably at an elevation above the rear ends of the mandrels, and the strips 12′ travel from the supply rolls over roll 13 and thence into the formers located on the mandrels. Each of these formers comprises a conical section 14 and a tubular section 15, the two sections being suitably connected and the tubular section being slightly larger than the mandrel. The paper strip travels into the conical section and the curved wall of this section causes the strip to curl transversely until, at the neck formed at the juncture between the two sections 14 and 15 the paper is caused to curl or wrap itself around the mandrel, changing from the flat strip 12′ to the tubular core 12″ (Fig. 4).

It is desirable that the overlapped marginal edges of the paper strip should be adhered and this may be done in various ways. The paper strip may be provided with adhesive along one marginal edge and this adhesive may be moistened by a moistening roller 16 supplied with water from a tank 17 and located between the roll 13 and the former 14 to moisten the adhesive on the strip sufficiently so that when the marginal edges are overlapped, as shown in Fig. 4, the adhesive will cement the marginal edges together during the passage of the core through the tubular section 15. But to insure adhesion of the marginal edges I may

also provide a spring finger 18 mounted on the former and projecting forward to press upon the overlapped marginal edges of the tubular reinforcement when it emerges from the former and for a sufficient time to insure adhesion. The roller 16 may be supplied with adhesive from the tank 17 instead of water, to apply the same to the strip 23, but at present I prefer using paper already supplied with adhesive at one marginal edge because I realize the difficulties of applying adhesive to the strip as it passes into the former.

I prefer to enclose the wall board in a paper covering and for this purpose a supply roll 19 is suitably supported and a paper strip 20 therefrom travels over a roll 21, beneath the formers and mandrels and over the belt 6. Another paper roll 22 is suitably supported and the paper strip 23 therefrom travels over a roll 24 and beneath the belt 8. As the strip 20 passes from the roller 21, its marginal edges engage guides 25 and rollers 26 which turn up sides 27 on the strip 20 to form a trough for retaining the stucco on the strip and to cover the side edges of the wall board. The marginal edges of the strip 23 engage guides 28 which turn down sides 29 on the strip 23 to overlap the sides 27 on the strip 20 whereby the stucco body is wholly enclosed within a paper covering. The guides 25 will, of course, be located between the bed 5 and the guide roller 21, so that the strip 20 will be formed into a trough before the strip receives the stucco; and the guides 28 will, of course, be located beyond the belt 8 to turn down the overlapping sides 29 after the body has been formed.

The stucco 30 is carried to the apparatus on a belt 31 and is discharged upon the cores and the strip 20 thereunder, said strip being supported by the belt 6, which in turn is supported by the rolls 7—7 and the roller bed 5. The stucco is at once carried forward beneath the roll 24 which operates as a guide roll for the strip 23 and also as a spreading or distributing roll for the stucco; but the customary screed may be provided in addition to the roll 24 if it should be found desirable.

It will be noted that the tubular cores are completely formed on the mandrels when they receive the stucco and the mandrels preferably extend sufficiently forward to form a firm and rigid support for the cores while the board is being formed. The cores are of sufficient strength to resist any tendency to crush after they leave the mandrels, and by which time the wall board has taken its shape, and they form a support for the body while the stucco is setting. The stucco will bond the overlapping marginal edges of the paper strips and also bond the cores to the body.

I have not shown the operating mechanism because that may be provided in many different ways to meet many different conditions. The invention provides a simple apparatus for making wall board in a continuous length and having longitudinal openings therein lined with material to strengthen and reinforce the body and at the same time enclosing the body in a paper covering, which I believe will be found to be the most desirable embodiment of the invention.

The operation of the apparatus may be as rapid as found desirable, consistent with satisfactory work, and after the operation begins the core material will be drawn from the rolls and formed into cores and caused to travel forward by the body of the wall board as the body is made.

If it is desired to make a wall board similar to a partition block and embodying my reinforcing cores, for such uses as partition blocks are now put, or for other uses, I may dispense with the paper rolls 19, 21, 22 and 24, and the paper strips 20 and 23 and also with the belt 8 and the rolls 9—9 and provide the customary screed at or about the position of the roll 24 for distributing and spreading the stucco. In such case I would provide side belts 32 (Fig. 6) traveling on a plurality of rolls 33 at the side edges of the belt 6 to support the stucco and form the side edges of the body. The belts 6 and 32 would be of sufficient length to support the body until the wall board becomes self-supporting, whereupon the wall board would be delivered on to a suitable conveyor which may be a continuation of the roller bed 5.

In the manufacture of partition blocks, it has been customary heretofore to mold the cores on mandrels (generally termed cores) which are drawn from the block after it is molded, at some stage of the setting.

I avoid the difficulties involved in the use of mandrels, (or cores) in this manner which are known in the art, and likewise avoid the necessity for the use of more or less complicated machinery and also the great waste that occurs in the manufacture of blocks in this way. By making the hollow cores upon which the body is formed, and preferably supporting the hollow cores on the mandrels during at least the initial part of the body forming step, I entirely eliminate the difficulties presented in connection with the use of cores in the manufacture of partition blocks and in withdrawing the cores from the blocks during the manufacture thereof, because, in the first place, my cores are never withdrawn from the body, but are formed in and remain in the body for all time, and in the second place, because the mandrels constitute only a support for and they are entirely covered by and enclosed in the cores, so that they are wholly

unaffected by and do not come in contact with the stucco material. This is a very important step in the manufacture of my wall board aside from the importance of the cores as reinforcements for the wall board, and it is apparent that my invention can be employed in the manufacture of blocks similar to the ordinary partition blocks, except that the blocks will be made on my cores substantially as hereinbefore described, with or without the paper covering, and the cores will remain in the blocks for whatever reinforcing value they may have in such blocks.

It will be understood, therefore, that by the expression "wall board" as used herein, I mean to cover and include any material of the nature of that herein described which can be made in accordance with my invention, whether or not it is covered with paper, and regardless of its size and thickness; and this would specifically include a comparatively thin material covered with paper or the like, probably in most cases thinner than partition blocks and thicker than plaster board, for use as a structural material, as well as a material more or less like the commercial partition blocks which are generally made, so far as I am aware, without any covering and which are of a substantial thickness.

It will be understood that my invention is valuable for making a new wall board such as I have heretofore defined, and is also valuable for making a wall board similar to the ordinary partition block, in such sizes as may be demanded, because of the facility which the cores provide for making the openings in such wall board; the cores perform a double function of facilitating the formation of the wall board, of whatever character it may be, and also of reinforcing the wall board.

I have shown an apparatus suitable for practicing the method herein described, but I appreciate that various changes may be made in this apparatus to satisfy different conditions, and I consider myself entitled to make all such changes as fairly fall within the scope of the following claims.

I claim:

1. A continuous method of making wall board which consists in forming paper cores continuously and moving the cores lengthwise as they are formed, depositing cementitious material upon and about the cores, and moving the cementitious material along with the cores and forming it to the shape and dimensions of the body of the wall board as it moves along.

2. A continuous method of making wall board which consists in forming paper cores continuously on a plurality of mandrels and moving the cores lengthwise of the mandrels as the cores are formed, depositing cementitious material upon and above the cores while they are on the mandrels and moving the cementitious material along with the cores and forming it to the shape and dimensions of the body of the wall board as it moves along, and applying paper sheets to the sides of the body as it is formed.

3. A continuous method of making wall board which consists in forming paper cores continuously on a plurality of mandrels and moving the cores lengthwise of the mandrels as the cores are formed, depositing cementitious material upon and above the cores while they are on the mandrels and moving the cementitious material along with the cores and forming it to the shape and dimensions of the body of the wall board as it moves along, and enclosing the body in a paper covering as it is formed.

4. An apparatus for making wall board, comprising a suitable bed, a mandrel supported above the bed, a core former on said mandrel, means for supplying core material to the mandrel and former to be formed thereby into a tubular core, means for delivering a hydrated cementitious material upon the core, and means for forming the body of the wall board on said core.

5. An apparatus for making wall board comprising a bed, a mandrel supported above the bed, a former comprising a conical section arranged on the mandrel, means for supplying core material to the mandrel and former to be formed thereby into a core, means for delivering hydrated cementitious material upon the core, and means for forming the body of the wall board upon the core.

6. An apparatus for making wall board, comprising a bed, a mandrel supported above the bed, a former on the mandrel and comprising a conical section and a cylindrical section, means for supplying core material to the mandrel and former to be formed thereby into a tubular core, means for delivering hydrated cementitious material to the core, and means for forming the body of the wall board on the core.

7. An apparatus for making wall board comprising a bed, a mandrel supported above the bed, a former on the mandrel, means for supplying core material to the mandrel and former to be formed thereby into a tubular core, means for adhesively affixing the overlapping edges of the core, means for delivering hydrated cementitious material to the core, and means for forming the body of the wall board upon the core.

8. An apparatus for making wall board comprising a bed, a mandrel suported above the bed, means for forming a hollow core on the mandrel, means for delivering hydrated cementitious material upon the core while on the mandrel, and means for forming the body of the wall board on the core.

9. An apparatus for making wall board comprising a bed, a mandrel supported above

the bed, means for forming a hollow core on the mandrel, means for delivering hydrated cementitious material upon the core while on the mandrel, and means for forming the body of the wall board on the core and at the same time moving the wall board through the apparatus.

10. An apparatus for making wall board comprising means for forming a tubular core, means for forming the body of the wall board on the core, and means for applying a covering to the body of the wall board.

CALEB PAYNE.