June 17, 1924. 1,497,980

R. J. JOHNSTON

APPARATUS FOR MAKING WALL BOARD

Filed Dec. 18, 1922

Fig. 1

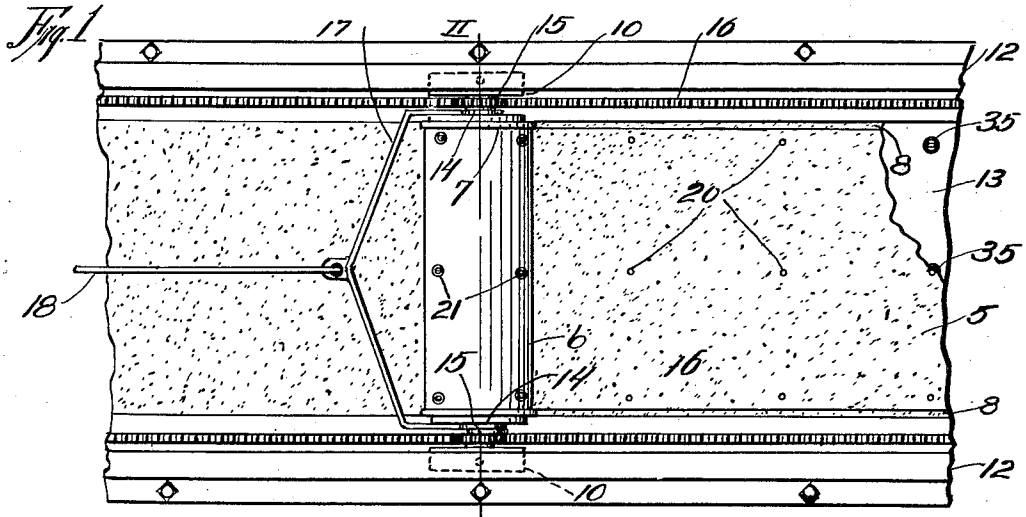



Fig. 2

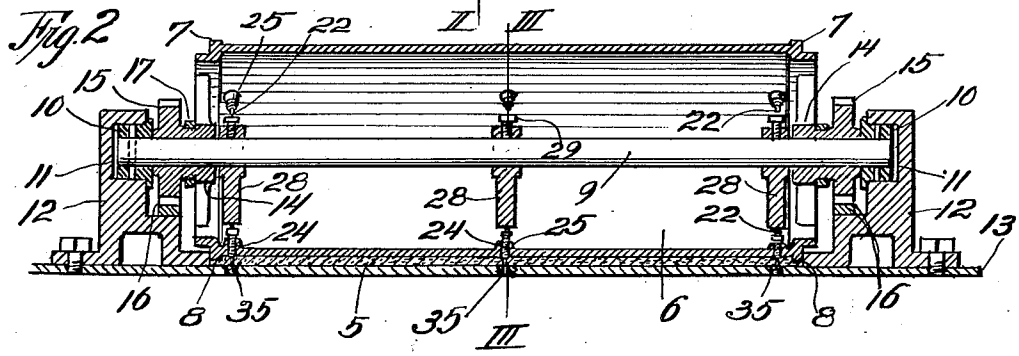



Fig. 3

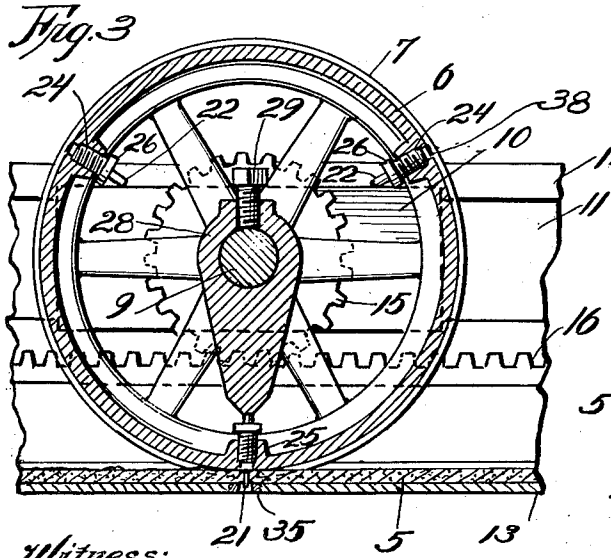
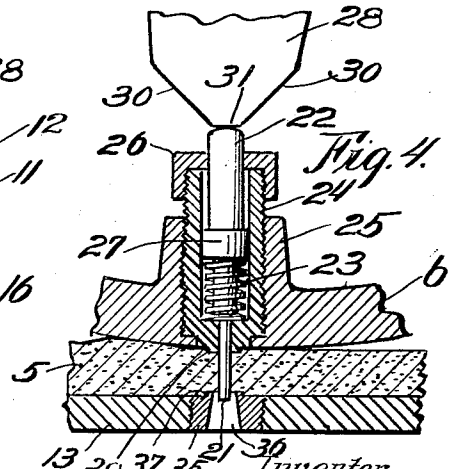



Fig. 4




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# UNITED STATES PATENT OFFICE.

ROBERT J. JOHNSTON, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-HALF TO GEORGE F. ROGGE, OF CORDER, MISSOURI.

## APPARATUS FOR MAKING WALL BOARD.

Application filed December 18, 1922. Serial No. 607,568.

*To all whom it may concern:*

Be it known that I, ROBERT J. JOHNSTON, a citizen of the United States, and resident of Kansas City, county of Jackson, State of Missouri, have invented a certain new and useful Improvement in Apparatus for Making Wall Board, of which the following is a complete specification.

The present invention relates to apparatus for use in the manufacture of wall board, such as is used for providing an interior wall facing, and with special reference to that kind of wall board which is made up in sections each formed with shouldered lips extending longitudinally along its opposite side edges, so that these sections are adapted to be arranged with their side lips matched together in lapping relation, for providing a wall board structure of substantially even and uniform cross section throughout.

One of the special objects of the invention is to provide an apparatus which is adapted not only for spreading the wall board material in sheets of uniform thickness and with the necessary lips of reduced thickness along the side edges of the sheets, but also for punching rows of nail-holes through the sheets at given distances apart, for facilitating the nailing operation when the wall board is to be secured in place.

Accordingly, I have devised an apparatus which comprises a suitable roller for spreading the material, and also preferably producing the shouldered lip formation, together with means operating simultaneously during the spreading action to punch one or more rows of perforations in the material, said punching means being preferably incorporated in the roller structure and operating in conjunction therewith.

With this general object in view, the invention will now be described by reference to the accompanying drawing illustrating one form of construction which I have devised for embodying the proposed improvements, after which those features deemed to be novel will be particularly set forth and claimed.

In the drawing—

Figure 1 is a plan view illustrating an apparatus constructed in accordance with the present invention;

Figure 2 is a section taken on the line II—II of Figure 1, but on a larger scale;

Figure 3 is a section taken on the line III—III of Figure 2; and

Figure 4 is an enlarged detail sectional view, illustrating one of the punching devices.

Referring now to the drawing in detail, this illustrates an apparatus of a character similar in certain respects to that shown in my copending application Serial No. 534,454, filed February 6, 1922, which has become Patent No. 1,452,742, the function being the same so far as pertains to the spreading of wall board material (such as straw board, wood pulp, or wood fibre and plaster, while in a plastic condition) into sheet form as indicated at 5, this operation being effected by means of a roller 6 having a flange 7 at each end for producing the shouldered lips 8 at each side of the sheet 5.

In the present construction, the roller 6 is journaled upon a shaft 9, the ends of which are secured to slide blocks 10 operated along guideways 11 in longitudinal frame members 12 secured the proper distance apart upon the supporting bed or surface 13 according to the width of sheet 5 to be manufactured, the flanged ends of the roller travelling along the lower inner edges of said member 12 (see Figure 2). The roller journals 14 are formed with gears 15 meshing with parallel racks 16 supported by the frame members 12 beneath the end portions of the shaft 9, with a view to securing, by the travel of said gears along said racks, an even, uniform movement of both ends of the roller in the spreading operation, as well as a smooth and accurate operation of the punching means, presently to be described. The roller structure may be operated in any desired manner, as by a bail member 17, the ends of which are swiveled upon the journals 14 of the roller, the bail being also provided with a pulling link or cable 18 for producing the necessary travel of the roller longitudinally of the frame members 12.

For producing as many rows of nail-openings 20 in the wall board sheet 5 as are desired, the roller 6 is provided with an equivalent number of sets of punching devices, and these sets are spaced apart a dis-

tance equal to the distance between said rows of openings 20, and the distance between the punching devices of each set is made to correspond to the distance between the openings 20 of each row. Each punching device comprises a punch 21 carried by a plunger 22 actuated by a spring 23 into normally retracted position within a sleeve 24 threaded through a boss 25 formed on the interior of the roller 6. Each sleeve 24 is fitted with a cap collar 26 adapted to limit the retracting movement of the plunger 22 by engagement with a shoulder 27 on the inner end of the latter. For actuating the punching devices, the shaft 9 is provided with a series of cam members 28, one for each set of punching devices, said members 28 being secured to the shaft by clamping screws 29. Each cam member 28 extends in depending relation to the shaft, and at its lower end is formed with an irregular cam edge, comprising two inclined portions 30 and a short intermediate horizontal portion 31, all as clearly illustrated in Figures 3 and 4.

In the operation of the apparatus, it will be understood that the roller is caused to travel over the material 5 by a pulling force exerted upon the bail 17, resulting in rotation of the roller and its punching devices, with translational movement of the shaft 9 which is prevented from rotating by the blocks 10 as the latter slide forward along the guideways 11. As the roller operates to spread the plastic material into sheet form and to produce the lips 8 along the side edges of the sheet, each of the cam members 28 actuates the corresponding set of punching devices as these are brought consecutively, by the roller's rotation, into engagement with the cam edges 30 and 31. The plungers 22 of the punching devices, as above stated, remain normally in retracted position until their inner ends become engaged with the forward cam edge 30, whereupon they are sharply actuated to thrust the punch 21 through the sheet of material 5, as the plunger traverses the cam edge portion 31, after which the plunger is as sharply retracted as it moves along the other cam edge 30, by the action of the spring 21 for withdrawing the punch from the material 5.

I also prefer to promote the efficiency of the punching operation by providing a row of socket elements 35 corresponding to each row of nail-openings 20 to be produced, these socket elements 35 being set in the bed or supporting surface 13. Each socket element 35 is formed with a central upwardly tapered opening 36, with the boss 37 at its upper end, which produces a slight depression in the wall board sheet 5 around the nail-openings for the purpose of countersinking the nail, while the object of the tapering shape of the opening 36 is to permit such clearance as is required for the punch 21 to accommodate the angular movement of the latter in passing into and out of vertical position. The outer end of each sleeve 24 is formed with a boss 38 (see Figure 4) similar to the boss 37, for producing a slight depression around the nail-openings on the upper face of the sheet 5.

It is thus apparent that I have devised a simple and compact apparatus for carrying out both the material spreading and nail-hole punching processes in a practical and efficient manner, and while I have illustrated and described what is now deemed to constitute the preferred form of construction for embodying the proposed improvements, I desire to reserve the right to make such changes or modifications as may fairly fall within the scope of the appended claims.

What I claim is:

1. In apparatus for making sheets of wall board, a bed providing a supporting surface for receiving the wall board material in plastic condition, a roller operable to spread said material into a sheet of uniform thickness over said supporting surface, a punching device carried by said roller into punching position with relation to said sheet once for each complete rotation of said roller, and means for actuating said punching device automatically each time the same arrives in punching position.

2. In apparatus for making sheets of wall board, a bed providing a supporting surface for receiving the wall board material in plastic condition, a roller operable to spread said material into a sheet of uniform thickness over said supporting surface, a punching device carried by said roller into punching position with relation to said sheet once for each complete rotation of said roller, and means moving with said roller in fixed relation to the axis thereof for automatically actuating said punching device each time the same arrives in punching position.

3. In apparatus for making sheets of wall board, a bed providing a supporting surface for receiving the wall board material in plastic condition, a shaft having only translational movement across said supporting surface and having a roller journaled thereon for spreading said material into a sheet of uniform thickness, a punching device carried by said roller into punching position with relation to said sheet once for each complete rotation of said roller, and an arm fixed to said shaft and operative to actuate said punching device automatically each time the same arrives in punching position.

4. In apparatus for making sheets of wall board, a bed providing a supporting surface for receiving the wall board material in plastic condition, a shaft having only translational movement across said supporting surface and having a roller journaled thereon for spreading said material into a sheet

of uniform thickness, a series of spring-retracted punching devices each carried by said roller into punching position with relation to said sheet once for each complete rotation of said roller, and an arm fixed to said shaft and formed with a cam edge operative to actuate said punching devices automatically as the same arrive successively in punching position.

5. In apparatus for making sheets of wall board having a shouldered edge along one side of the sheet, a bed providing a supporting surface for receiving the wall board material in plastic condition, a roller operable to spread said material into a sheet of uniform thickness and provided with an annular enlargement operative to produce said shouldered edge by depressing the material along one side of the sheet, a series of spring-retracted punching devices each carried by said roller adjacent said enlargement and moved by said roller successively into punching position with relation to said edge portion of the sheet once for each complete rotation of said roller, and an arm fixed to said shaft and formed with a cam edge operative to actuate said punching devices automatically as the same arrive successively in punching position.

6. In apparatus for making sheets of wall board, a bed providing a supporting surface for receiving the wall board material in plastic condition, a roller operable to spread said material into a sheet of uniform thickness over said supporting surface, gear and rack means for producing uniform travel of both ends of said roller, a series of punching devices each carried by said roller into punching position with relation to said sheet once for each complete rotation of said roller, and means moving with said roller in fixed relation to the axis thereof for actuating said punching devices automatically as the same arrive successively in punching position.

7. In apparatus for making sheets of wall board, a bed providing a supporting surface for receiving the wall board material in plastic condition, a roller operable to spread said material into a sheet of uniform thickness over said supporting surface, a plurality of sets of punching devices carried by said roller for punching separate rows of nail-holes running longitudinally of the sheet, the punching devices of each set being operated by the movement of said roller successively into punching position with relation to the sheet once for each complete rotation of the roller, and means moving with said roller in fixed relation to the axis thereof for automatically actuating the punching devices of both sets as said devices arrive successively in punching position.

8. In apparatus for making sheets of wall board, a bed providing a supporting surface for receiving the wall board material in plastic condition, a roller operable to spread said material into a sheet of uniform thickness over said supporting surface, spaced longitudinal frame members carried by said bed and formed with parallel guideways, a shaft having its opposite ends provided with slide blocks movable along said guideways for permitting translational movement of the shaft at a uniform height over said supporting surface, a roller journaled on said shaft and movable therewith to spread said material into a sheet of uniform thickness, a punching device carried by said roller into punching position with relation to said sheet once for each complete rotation of said roller, and an arm fixed to said shaft and operative to actuate said punching device automatically each time the same arrives in punching position.

9. In apparatus for making sheets of wall board, a bed providing a supporting surface for receiving the wall board material in plastic condition, a roller operable to spread said material into a sheet of uniform thickness over said supporting surface, a punching device carried by said roller into punching position with relation to said sheet once for each complete rotation of said roller, means for actuating said punching device automatically each time the same arrives in punching position, and a row of socket members in said bed providing openings in said supporting surface in positions for receiving the end of said punching device as the latter is projected below the underface of the sheet in the successive punching operation.

10. In apparatus for making sheets of wall board, a bed providing a supporting surface for receiving the wall board material in plastic condition, a roller operable to spread said material into a sheet of uniform thickness over said supporting surface, a punching device carried by said roller into punching position with relation to said sheet once for each complete rotation of said roller, means for actuating said punching device automatically each time the same arrives in punching position, and a row of socket members in said bed providing openings in said supporting surface in positions for receiving the end of said punching device as the latter is projected below the underface of the sheet in the successive punching operation, the upper edges of said socket openings being provided with bosses to form depressions around the openings produced by said punching device.

11. In apparatus for making sheets of wall board, a bed providing a supporting surface for receiving the wall board material in plastic condition, a roller operable

to spread said material into a sheet of uniform thickness over said supporting surface, a punching device carried by said roller into punching position with relation to said sheet once for each complete rotation of said roller, and means for actuating said punching device automatically each time the same arrives in punching position, said roller being provided with a boss for forming a shallow depression around the opening produced by said punching device.

In witness whereof I hereunto affix my signature.

ROBERT J. JOHNSTON.