

# UNITED STATES PATENT OFFICE.

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## PROCESS OF MANUFACTURING COMPOSITION BOARDS.

940,450.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, JOHANN FERLÀ, a citizen of Switzerland, residing at St. George, county of Richmond, New York, have invented new and useful Improvements in Processes of Manufacturing Composition Boards, of which the following is a specification.

This invention relates to improvements in processes of manufacturing composition boards, and it has for its object the provision of an improved process whereby composition boards of great strength and durability may be economically produced from a mixture of hydraulic cement, asbestos and other ingredients.

In practicing the process, the ingredients preferably employed are hydraulic cement, hemp, asbestos, acetic acid, liquid glue and coloring matter, if desired. The asbestos and hemp are first cut and crushed into very small and fine pieces, almost to a powder, these operations being preferably performed by means of a special cutting machine and right and left revolving crusher. The materials are then elevated, preferably by suction, to a storage room or bin. The finely cut and crushed asbestos and hemp are then mixed in the dry state with cement and coloring matter by any suitable mixing apparatus, such as a rotary mixer or revolving kettle. The dry mixture is then transferred to another mixing machine, where the necessary quantities of acetic acid, liquid glue and water are added. At this stage, the mixture is a pasty mass which is then transferred to a large tank provided with an agitator to prevent the material from settling or hardening. From this tank the paste is carried by a conveyer to a canal where water is added in sufficient quantity to make the mixture flow freely, and from the canal the thin paste flows into tanks of different sizes provided with automatic outlets each adapted to permit the paste to flow from the tank in precisely the proper quantity for the production of composition board of a certain thickness. All of these tanks discharge upon a traveling web or screen, preferably of wire-cloth, which permits the bulk of the water in the mixture to drain off. From this web or screen the material passes to an endless strip of felt running between adjustable rollers which serve to gage thickness of

the composition board with accuracy. The felt absorbs a certain portion of the water remaining in the mixture and while traveling upon the felt the material hardens sufficiently to be cut as it leaves the felt into pieces of any desired dimensions. The pieces of material are then taken from the cutting apparatus to a powerful hydraulic press and piled in the pressure chamber of the press in numbers corresponding to the capacity of the press. The layers of material are separated by suitable spacing-plates of thin sheet iron or steel to prevent the transformation of the separate pieces into a single compact mass under pressure, and the pressing operation is carried on in a hermetically closed chamber connected at top and bottom with suction pumps. The suction pump at the top exhausts the air from the chamber and the material and the other at the bottom of the chamber removes the water from the material, thus supplementing the action of the press in producing a thoroughly homogeneous material entirely free from air-holes or pores. After the pressing operation the material is still somewhat plastic and may be pressed by suitable dies into any ornamental design or shape or may be readily cut into ornamental patterns by suitable cutting apparatus.

Before the material is ready for use it should be allowed to harden or set for seventy-two hours after leaving the presses and then should be dipped for a few seconds into water and allowed to dry off. The material is then ready for use and is characterized by great strength, firmness and solidity, but is susceptible of working with ordinary wood-working tools and is entirely free from warping. It is also fire-, acid- and water-proof and is excellent material for insulating electrical conductors.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The process of producing composition boards consisting in first mixing hydraulic cement and fibrous material in the dry state, and then adding to the dry mixture glue, an acid solvent for glue and water in sufficient quantity to make the material flow readily, next forming layers from the mixture, then pressing the layers and finally allowing the pressed layers to set or harden.

2. The process of producing composition boards consisting in first mixing asbestos, hemp and hydraulic cement in the dry state, then adding acetic acid, glue and water in  
5 sufficient quantity to make the mixture flow freely, forming layers of material from the mixture, pressing the layers and allowing them to set or harden.

3. The process of producing composition  
10 boards which consists in forming a mixture containing mineral fiber, hydraulic cement and water in sufficient quantity to make the mixture flow freely, forming a layer of the mixture, draining the excess of liquid from  
15 the layer, pressing the layer in a vacuum and allowing it to harden.

4. The process of producing composition boards consisting in forming a mixture containing mineral fiber, hydraulic cement and  
20 water in sufficient quantity to make the mixture flow freely, flowing the mixture on a moving perforated screen in a layer to permit the excess water to drain off, pressing the layer in a vacuum and allowing it to  
25 set or harden.

5. The process of producing composition boards consisting in first making a mixture containing mineral fiber, hydraulic cement and water in sufficient quantity to make the  
30 mixture flow freely, flowing the mixture on a moving screen in a layer to allow the excess of water to drain off, piling a plurality of the layers of material in a press with interposed pieces of sheet metal, pressing the  
35 layers in a vacuum, and finally allowing the material to set or harden.

6. The process of producing composition boards consisting of mixing asbestos, hemp, hydraulic cement, acetic acid, glue and water  
40 in sufficient quantity to make the mixture flow freely, flowing the mixture on a moving

perforated screen in a layer, pressing the layer in a vacuum and allowing it to set or harden.

7. The process of producing composition  
45 boards, consisting of first mixing asbestos, hemp, acetic acid, hydraulic cement, glue and sufficient water to make the mixture flow freely, forming a layer from the mixture and draining the water therefrom, sub-  
50 jecting the layer to pressure in a hermetically sealed chamber and simultaneously producing a vacuum in said chamber by suction pumps connected with the chamber at both top and bottom, and finally allowing  
55 the material to set or harden.

8. The process of producing composition boards consisting in mixing asbestos, hemp, cement, acetic acid, glue and water in sufficient quantity to make the mixture flow  
60 freely, forming layers of material from the mixture, piling the layers so formed in a press with interposed pieces of sheet metal, pressing the layers in a hermetically closed chamber and simultaneously producing a  
65 vacuum in said chamber by means of pumps connected with the chamber at the top and bottom, and finally allowing the material to set or harden.

9. The process of producing composition  
70 boards consisting in mixing fibrous material, hydraulic cement, acetic acid, glue and water, forming a layer of the material, pressing the layer, allowing it to set or harden, then dipping it in water for a few  
75 moments and allowing it to dry.

In testimony whereof, I have signed my name in the presence of two witnesses.

JOHANN FERLÄ.

Witnesses:

WM. BRADFORD,  
GILBERT GANNON.