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R. P. PERRY
CONSTRUCTION MATERIAL
Filed May 23, 1918

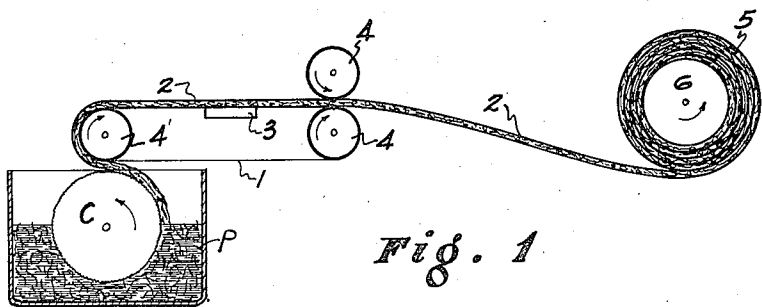
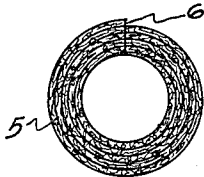


Fig. 2



Fig. 3

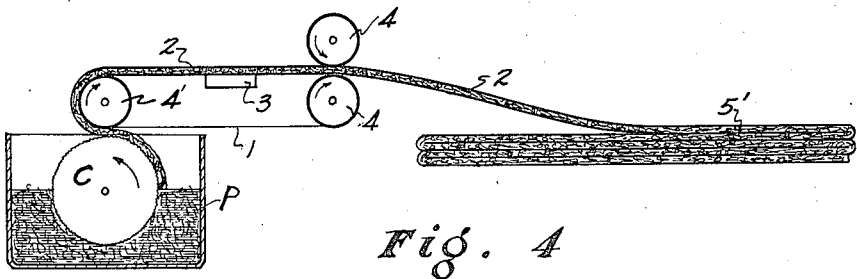
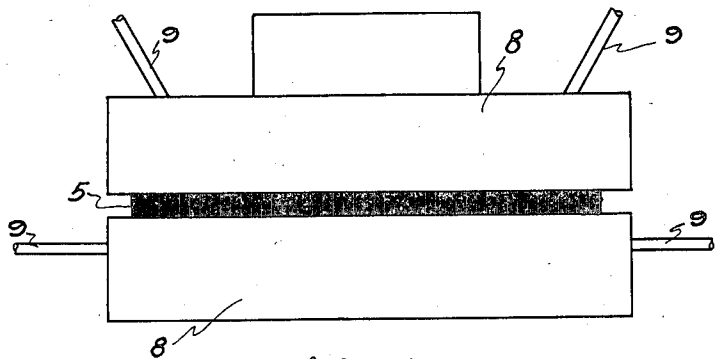


Fig. 5

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CONSTRUCTION MATERIAL.

Application filed May 23, 1918. Serial No. 236,128.

To all whom it may concern:

Be it known that I, RAY P. PERRY, a citizen of the United States, residing at Upper Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Construction Materials, of which the following is a specification.

This invention relates to a process for producing a new and useful construction material and the product thereby obtained.

The object of the invention is to produce a construction material which shall possess good wearing qualities, and which may be manufactured in large quantities in a rapid and convenient manner, and which shall be easy to handle.

Another object of the invention is to produce a construction material which may have a smooth external surface, be impervious to water, possess considerable mechanical strength, and resist splitting or fracture.

Another object of this invention is to produce a material which is suitable for a variety of uses, such as boarding, roofing, etc., where such characteristics as stiffness, economy, and attractiveness of appearance are desirable.

In the production of this product, a quantity of comminuted waterproofing material such as pitch, asphalt, resin, etc., may be mixed with a watery pulp of fibrous material, and this mixture then formed into a sheet upon an ordinary felt or paper-making machine. After the sheet has been partially freed from entrained water, it may be wound upon a mandrel or otherwise in order to form a hollow cylinder having a wall of the proper thickness which will be determined by the thickness of the sheet and the number of convolutions of the same. The sheet may, however, be wound up while very wet or after being well dried, and may be folded instead of rolled up.

If the sheet is wound on a mandrel, as is preferred, it will be severed at the proper time and the cylinder will be slitted longitudinally along one side thereof and opened out into a flat sheet. By means of heat and pressure this sheet is dried and solidified until the successive layers become intimately joined together. This intimate union of the sheets is greatly promoted by the particles of bituminous material which become fused by the heat and effectively cause the

sheets to become united. At the same time, the fibers distributed throughout the mass serve to give strength and rigidity to the same, which would not be obtained by a sheet of fibers or a sheet of waterproofing material alone.

The invention will be readily understood from the accompanying drawings in which,

Fig. 1 is a view showing the sheet coming from a paper-making machine and being wound up;

Fig. 2 is an end view of the slitted cylinder;

Fig. 3 shows the unfolded laminated sheet of material;

Fig. 4 is a view similar to Fig. 1 showing the laminated sheet being formed by folding instead of rolling it up; and

Fig. 5 represents diagrammatically a press for the sheet.

In the drawings, reference character 1 designates the usual "wet blanket" of an ordinary paper-making machine P. Carried along this blanket 1 is the sheet 2 of material which has preferably been formed on the cylinder C of the paper-making machine P. This sheet 2 is produced by mixing the desired proportions of fibrous and comminuted waterproofing materials in a suitable beater, introducing a water pulp of the same into the paper-making machine where it is formed into a sheet on the cylinder C and passes out along the blanket 1 as indicated. Any other suitable means may be used for forming the thin sheet of the mixture, the paper-making machine being indicated merely for illustrative purposes. The amount of waterproofing material may vary from 50% to 90% or more of the water free content of the finished material, and will preferably be introduced into the beater in the form of filaments, or slender, cylinder-like bodies when an ordinary paper-making machine is used.

The sheet 2 passes over the suction box 3 where a portion of the water will be extracted, and then passes between the rollers 4 where more of the water is squeezed out. From the rollers 4 the partially dried sheet 2 may be wound up into a cylinder 5 upon a mandrel 6, or formed into a cylinder in any other convenient manner so that the successive convolutions are in contact with each other. Instead of the sheet being rolled up as indicated in Fig. 1 to form the cylinder 5,

it may be folded back and forth upon itself to form the laminated sheet 5' as indicated in Fig. 4. When a sufficient number of turns have been taken in Fig. 1 to produce the desired thickness of the cylinder wall 5, or a sufficient number of laps have been made in Fig. 4 to produce the desired thickness of the laminated sheet 5', the sheet 2 is severed and a new cylinder or laminated sheet is begun. The sheet 2 should preferably be made quite thin and a large number of convolutions or laps be used to produce the proper thickness of the finished article. Very satisfactory results have been obtained, for example, by making the sheet 2 only a few hundredths of an inch thick and using about 25 layers of the same.

An excellent finished product has been obtained by removing sufficient water by means of the suction box 3 and rolls 4, so that the sheet 2, when rolled or folded up, contains less than 60% by weight of water. The successive layers of this damp sheet stick together to some extent, thus facilitating the subsequent operations of the process for the production of the finished article. It is to be understood, however, that the sheet 2 may contain more or less water than indicated above or may be completely dried before being rolled or folded up without departing from the spirit of this invention. The rolling or folding up while the sheet 2 is still moist or damp appears to give a better initial clinging of the layers together than is obtained by first drying it and then forming the laminated article.

When the walls of the cylinder 5' have reached the proper thickness, the sheet 2 is cut off, the cylinder 5 is slitted longitudinally from end to end as indicated by the line 6 in Fig. 2, and spread out into the laminated sheet 7.

The laminated sheet 7, Fig. 3, or the laminated sheet 5', Fig. 4, is then dried and pressed in order to more thoroughly unite the layers and form a more rigid, hard and more nearly homogeneous product. The drying may be done in a drying room or in any convenient and well known manner. Fig. 5 shows means by which the laminated sheet 5 may be heated and pressed. The sheet 5 is placed between the two pressure members 8 of a hydraulic or other press, which may be heated, if desired, by means of suitable heating means such as is represented by reference characters 9. Irrespective of whether the sheet 5 is dried before or after being admitted to the press, the waterproofing material, being hot, fuses and intimately unites the several layers into an integral mass of great solidity. The fibers on the adjacent surfaces of the laminations seemingly mat or intermingle during the pressing operation, or at least are firmly attached to each other so that there is very

little, if any, plane of demarcation between any two adjacent layers after the hot pressing operation is completed. The product is in effect one integral, homogeneous mass.

The final product obtained by this invention possesses characteristics different from those possessed by hitherto known products obtained from fibrous and waterproofing materials. Its surface may be smooth, and polished; its specific gravity may be greater than unity depending upon the materials and pressure used; a board made from high melting point bituminous material will not soften and sag in the sunshine; it resists penetration by moisture or hard substances such as nails; but it can be nailed or screwed without splitting or fracture.

It has been found by testing certain sheets made in accordance with this process at a given pressure, that when the sheet contains 25% of pitch it will absorb 85% of water by weight when immersed in water for 20 hrs.; when the sheet contains 33% of pitch it will absorb 58% of water, and when the sheet contains 67% of pitch it will absorb only 13% of water when immersed in water for the same length of time. The sheets can evidently be made so that they will absorb a smaller percentage of water by using higher pressures for their formation.

What I claim is:

1. The process of producing a construction material which comprises the steps of forming a sheet of mixed fibrous and comminuted waterproofing materials, superposing a plurality of said sheets upon each other, and subjecting substantially the entire area of said sheets to pressure at one time and heating the same so that the waterproofing material becomes fused and the sheets firmly united.

2. The process of producing a construction material which comprises the steps of forming a thin sheet of mixed fibrous and comminuted waterproofing materials, superposing a plurality of said sheets upon each other, and drying, heating and pressing said sheets to unite the same by pressure applied only perpendicularly to said sheets.

3. The process of producing a construction material which comprises the steps of providing fibrous material, mixing therewith more comminuted bituminous material, than the weight of the fibrous material, forming a thin sheet of the mixture, superposing a plurality of said sheets upon each other, and drying, heating and pressing said sheets by pressure applied only perpendicularly to said sheets to unite the same.

4. The process of producing a construction material which comprises the steps of forming a thin sheet of mixed fibrous and comminuted bituminous materials, winding said sheet to form a cylinder, slitting said cylinder and opening it into a laminated

sheet, drying, heating, and pressing said laminated sheet so that the bituminous material becomes fused and the layers united.

5 5. The process of producing a construction material which comprises the steps of forming a thin sheet of mixed fibrous material and comminuted pitch, winding said sheet to form a cylinder, slitting said cylinder and opening it into a laminated sheet, 10 drying, heating and pressing said laminated sheet so that the pitch becomes fused and the layers united.

15 6. The process of producing a construction material which comprises the steps of forming a thin sheet of mixed fibrous and comminuted waterproofing materials on a paper-making machine, superposing a plurality of said sheets upon each other, and 20 subjecting substantially the entire area of said sheets to pressure at one time and heating the same so that the waterproofing material becomes fused and the sheets firmly united.

25 7. The process of producing a construction material which comprises the steps of forming, as a moist sheet, a layer of mixed fibrous and comminuted waterproofing materials, superposing a plurality of said sheets upon each other, and drying, heating and 30 pressing said sheets by pressure applied only perpendicularly to said sheets to unite the same.

35 8. The process of producing a construction material which comprises the steps of forming a thin sheet of mixed fibrous and

comminuted waterproofing materials, superposing a plurality of said sheets upon each other, and drying, heating and pressing said sheets by pressure applied only perpendicularly to said sheets so as to make the mass 40 substantially homogeneous throughout.

9. The process of producing a construction material which comprises the steps of forming a thin sheet of paper-making fibers and comminuted pitch, superposing a plurality of said sheets upon each other and 45 subjecting substantially the entire area of said sheets to pressure at one time and heating the same so that the pitch becomes fused and the several sheets become united. 50

10. As an article of manufacture, a construction material comprising a plurality of layers of fibrous and bituminous materials in substantially the proportions of one to three which have become intimately united 55 with each other by heat and pressure applied substantially perpendicularly to the surfaces of said sheets.

11. As an article of manufacture, a construction material composed of a plurality of sheets which have been intimately united 60 by heat and pressure applied substantially perpendicularly to the surfaces of said sheets to produce a substantially homogeneous material, said sheets containing a felted mass 65 of fibrous material and bituminous material in excess of the fibrous material.

In testimony whereof I affix my signature.

RAY POTTER PERRY.