

## UNITED STATES PATENT OFFICE.

RAY P. PERRY, OF UPPER MONTCLAIR, NEW JERSEY, ASSIGNOR TO THE BARRETT COMPANY, A CORPORATION OF NEW JERSEY.

## BUILDING MATERIAL.

No Drawing.

Application filed July 10, 1920. Serial No. 395,336.

This invention relates to improvements in the manufacture of building or construction material, such as roofing, siding, etc. More particularly it relates to the manufacture of felted sheets and bodies which are made from a pulp mixture of fibrous material and comminuted waterproofing material.

Heretofore it has been customary in this art to form a sheet of fibrous material on a paper making machine, to dry the sheet and then saturate it with waterproofing material and afterwards coat it on one or both sides with plastic material such as asphalt after which a layer of wear-resisting material such as crushed stone or slate may be applied. In such sheets difficulty is sometimes experienced in obtaining the desired amount of saturation especially if wood fibres or paper making stock is used in forming the sheet, and in order to overcome this difficulty comminuted bituminous material is sometimes introduced into the paper making machine along with the water pulp fibrous material and becomes incorporated into the sheet as it is formed. In this case trouble arises on account of sticking to the hot drying rolls during the drying operation.

The object of the present invention is to overcome the above enumerated and other difficulties and to produce a sheet that is well saturated, can be readily dried of water, and will retain its flexibility for a long time.

In carrying out this invention, the comminuted waterproofing material may be in the form of small bodies produced by making an emulsion of the waterproofing material, such as tar, pitch, or asphalt in water, to which clay has been added.

In many cases it is desired to use relatively soft and low melting point bituminous materials, such as tar or asphalt, so as to produce a sheet having considerable flexibility even in cold weather. For example, it may be desirable to use such a material having a melting point of about 100° F., the melting point being determined by the well known half inch cube method. Such a material is usually quite sticky at normal room temperatures, and although stickiness may be greatly reduced by using the material in the form of a watery emulsion, nevertheless it is often troublesome in that, when the usual paper making machine is used for

producing the sheet, the pulp mixture or sheet may stick somewhat to the wire cylinder of the paper machine or to the press rolls where surplus water is removed by pressure before the sheet goes to the driers. By using higher melting point materials, this sticking trouble on the wire and press rolls may be obviated but the use of higher melting point material gives a stiffer, less flexible sheet which is more brittle in cold water.

I have discovered a method by which the advantage of using the higher melting point material in forming the sheets can be secured without the disadvantage of having a stiff and brittle product. I secure this result by using relatively high melting point comminuted bituminous material and after the sheet has been formed on the paper machine and dried, I then temper the sheet by treating it with a relatively quite soft and low melting point grade of waterproofing material, which acts to soften and cut back the high melting point material in the sheet. I may, for example, do this by immersing the sheet of felt containing high melting point asphalt in a saturating bath containing very low melting point asphalt. Some of the low melting point asphalt will act to cut back or soften the high melting point asphalt. For example, I may use asphalt of say 160 to 180° F. melting point in forming the sheet and then pass the dried sheet through a hot bath of 70 to 90° melting point asphalt.

In making the sheet upon a paper making machine, the emulsion may be used in such amounts that there will be 70% or more of the emulsion by weight to 30% or less of the fibrous material, and a sheet may be formed in the manner commonly used in paper manufacture. It has been found in actual practice that a sheet will not form when a paper making machine of the type having a foraminous cylinder is employed, if the bituminous material used in making the emulsion is too liquid or has too low a melting point and is used in as large proportions as are desirable for saturation purposes. If the bituminous material is too soft the machine will be gummed up during the making of the sheet.

During the saturation step by means of the oily or asphaltic material the "emulsified" and dried sheet is passed through a hot bath of a saturant which is absorbed and imparts

the enhanced desirable qualities to the sheet. In this step of the process the harder bituminous material used in the emulsion seems to be "cut back" by the softer hot saturant so it takes a much longer time for it to lose sufficient volatile material to cause the sheet to become brittle. It is well known that the softer grades of oily and asphaltic materials are capable of losing more volatile materials and it will take a correspondingly greater length of time for them to become hard than it will take the grades of higher melting points.

Some of the advantages obtained by this invention are: a better saturated sheet is obtained than is usually produced by the old processes; the sheets can be rapidly produced without putting the machines out of commission; the difficulty of sticking to the hot drying rolls is eliminated, a sheet of good lasting qualities is produced; and materials of low cost can be utilized in producing the sheet.

I claim:

1. The herein described process which comprises forming a sheet containing fibrous material and an emulsion of bituminous material, an emulsifying agent and water, drying said sheet, and introducing into said sheet waterproofing material having a larger percentage of volatile constituents than said bituminous material.

2. The herein described process which comprises forming a sheet containing fibrous material and an emulsion of bituminous material, clay, and water; drying said sheet; and introducing into said sheet waterproofing material having a lower melting point than said bituminous material.

3. The herein described process which comprises forming a sheet containing fibrous

material and an emulsion of bituminous material, clay, and water; drying said sheet; and introducing into said sheet asphaltic material.

4. The herein described process which comprises forming a sheet containing fibrous material and an emulsion containing asphaltic material, drying said sheet; and introducing into said sheet asphaltic material of a lower melting point.

5. The herein described process which comprises forming a sheet containing fibrous material and an emulsion containing asphaltic material of about 170° F. melting point, clay, and water; drying said sheet; and introducing into said sheet asphaltic material of a melting point about 80° F.

6. The herein described process which comprises forming a sheet containing fibrous material and an emulsion of bituminous material, clay, and water; drying water out of said sheet; and passing said sheet through a bath of low melting point waterproofing material.

7. The herein described process which comprises forming a sheet containing fibrous material and an emulsion of bituminous material, clay, and water; drying water out of said sheet; and passing said sheet through a hot bath of asphaltic material of low melting point.

8. The herein described process which comprises forming a sheet containing about 30% fibrous material and 70% of an emulsion of asphaltic material of high melting point, clay, and water, drying said sheet, and saturating it with a low melting point asphaltic material.

In testimony whereof I affix my signature.

RAY P. PERRY.

### CERTIFICATE OF CORRECTION.

Patent No. 1,663,095.

Granted March 20, 1928, to

RAY P. PERRY.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, line 65, for the word "water" read "weather"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of May, A. D. 1928.

(Seal)

M. J. Moore,  
Acting Commissioner of Patents.

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