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UNITED STATES PATENT OFFICE

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PROCESS FOR MANUFACTURING ARTIFICIAL STONE PLATES OF FIBROUS MATERIALS AND HYDRAULIC CEMENT

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The present invention relates to the manufacture of artificial stone plates from fibrous material by means of hydraulic cement.

It is known to manufacture artificial stone plates of fibrous materials and hydraulic cement by mixing fibrous asbestos with a substantial excess of cement and water, treating the mixture in the paper machine, winding up the moist web or sheet of material upon a drum, cutting off plates of a desired size and subjecting the plates to high pressure. After the setting of the cement the plates manufactured in the aforesaid manner will acquire a high strength, they are extraordinarily dense, durable and light; if required the plates may also be nailed. A certain drawback of the asbestos cement plates of the before mentioned kind is that they disintegrate under the sudden influence of high temperatures, this fact being of considerable inconvenience if buildings covered with such plates are on fire. This phenomenon is probably due to the stratified structure of the plates and to the fact that they still contain some water, that on heating is converted into steam which cannot escape and by its pressure bursts the plates.

The invention relates to improvements of the above mentioned method or process of manufacturing artificial stone plates; the improved process allows of obtaining on the paper machine, from fibrous materials, hydraulic cement and water, artificial stone plates of any desired thickness, which do not have the above mentioned disadvantages but may be heated when exposed to immediate action of an open flame, so as to become incandescent without changing sensibly, especially without bursting. I have made the surprising observation that it is sufficient to incorporate into the plates a small quantity of an oily or fatty substance, i. e. mineral oil or vegetable oil or animal fat to impart to them the desired fire proofness. The mineral oil or the like can be added in any phase of the process, that is, it can be either admixed in the vat or in the stirring box, or sprinkled on the web or sheet of material, while it is formed on the paper machine, or on the moist asbestos cement pulp wound up on the winding drum. Experiments continued for a long time have shown that the above mentioned addition has no unfavorable influence on the setting and hardening of the cement, nor does it injure in any way the qualities of the finished plates.

The process of manufacturing artificial stone plates from fibrous material and hydraulic cement under admixture of an oil is, therefore characterized thereby that the mixture of hydraulic cement, fibrous material and water is treated in a well known manner on the paper machine, and that the oil is added in any desired phase of the said process, for the purpose of obtaining artificial stone plates, which do not burst under the influence of heat.

Although fatty oils may likewise be used for the intended purpose, the process is preferably carried out by using mineral oils. As regards the properties of the mineral oils to be used I have found that oils of different quality may be applied. A refined light mineral oil of the viscosity 4, 5 at a temperature of 122° F., and of an inflammation point 392° F. of the kind, which is frequently used as lubricating oil for bearings of speedy running machine parts of small weight has proved to be very suitable. The quantity of added oil amounts to about 5 per cent of the weight of the solid constituents of the plates.

It is already known to use asphalt, bitumen, paraffine and the like for increasing the compactness of articles manufactured from cement, or cement with different additions, by admixing these substances to the bulk or applying them to the surface of said articles. It has furthermore been proposed to manufacture plates from cement and asbestos having short fibres, or asbestos powder under admixture of mineral oils. In this case, however, fibrous asbestos is not used and the treatment is not carried out on the paper machine but the mixture of cement and asbestos is uniformly mixed with mineral oil and some water and then forced through the mouthpiece of a press, the added mineral oil acting as a lubricant. In this process the cement only amounts to from one third to one half of the dry mixture, whereas in working on the

paper machine the cement amounts to a quantity exceeding by far that of the fibrous asbestos.

What I claim is:—

1. Laminated artificial stone plates, consisting of a mixture of hydraulic cement and water with fibrous material and an addition of oil, which will not burst when heated to incandescence by an open flame.

2. Laminated artificial stone plates, consisting of a mixture of hydraulic cement and water with fibrous material and an addition of mineral oil, which will not burst when heated to incandescence by an open flame.

3. Laminated artificial stone plates, consisting of a mixture of hydraulic cement and water with asbestos and an addition of oil, which will not burst when heated to incandescence by an open flame.

4. The process for manufacturing artificial stone plates which comprises mixing a hydraulic cement and water with a long fibered asbestos, forming the mixture into a web on a paper making machine, and sprinkling a light oil on the web.

5. The process of manufacturing artificial stone plates which comprises mixing a hydraulic cement and water with long asbestos fibers, forming the mixture into a web on a paper making machine, and adding a quantity of light oil amounting to about five percent of the weight of the solid constituents at any phase of the process.

6. The process of manufacturing artificial stone plates which comprises forming a mixture of hydraulic cement, water and long fibers of asbestos, forming sheets of said mixture, adding an oil to said mixture during any stage of the process, and forming a laminated plate of said sheets whereby the stone plates are prevented from bursting by influence of heat.

7. The process of manufacturing artificial stone plates which comprises forming a mixture containing water, long asbestos fibers, and a larger amount of hydraulic cement than asbestos, forming said mixture into a thin sheet on a paper making machine, adding to said sheet about five percent of the weight of said solid constituents of oil, forming a laminated plate of a plurality of sheets formed as specified, subjecting said plate to pressure, and permitting the cement to set.

In testimony whereof I affix my signature.

ROBERT KUNZ.