

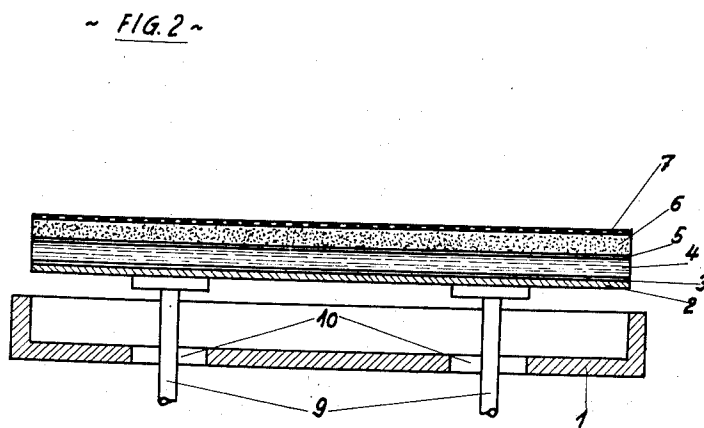
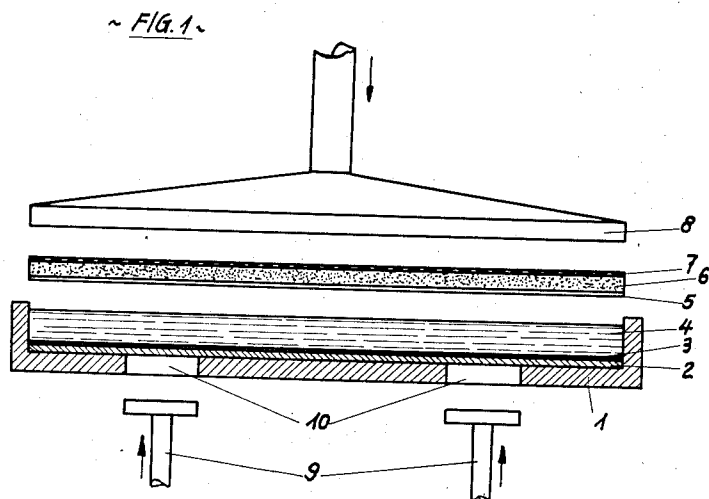
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PROCESS OF MOLDING PLATES

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PROCESS OF MOLDING PLATES

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Many processes are already known for the manufacture of slabs and other articles of cement, starting from the process as used by artisans which consists in first moulding the mortar and thereafter proceeding to smooth or polish the conditioned and hardened surfaces, down to the industrial manufacture of many different types of slabs formed from mixtures of mineral or organic fibrous materials and cementitious and analogous materials.

The process according to the present invention is entirely different from any known process and it is concerned with the industrial production of slabs which may be coloured throughout the whole body or only upon the surface with single colours, or with colours arranged in patterns as for example in imitation of natural marbles, the surface being either smooth or provided with patterns in relief and their configuration being either flat, undulating or of any other convenient form.

With a view to facilitating an understanding of the invention there will be described the manufacture of flat slabs suitable for reinforcements and coverings by reference to the diagrammatic Figs. 1 and 2 of the accompanying drawing.

Upon the surface of a mould 1 there rests a metal plate 2 covered by a flexible sheet 3 and upon this sheet 3 there is uniformly distributed for example by the aid of a suitable automatic distributor, a dry mixture of material comprising fibrous or granular elements mixed with a suitable proportion of a hydraulic cementitious material.

An elastic cushion 6 which may be formed of felt or sponge rubber free or fixed to a perforated metal sheet 7 and covered by a sheet of cloth 5 is preliminarily soaked by immersion in water or an aqueous solution of a kind suitable to ensure the setting of the hydraulic cementitious material, and is placed upon the layer of material 4 with light pressure given by means of a platen 8 operated in any convenient manner as for example by means of a hand lever, a screw or a hydraulic piston.

Fig. 2 shows the way in which the slab formed in the above described manner is lifted from the mould assembly together with the cloth and the metal sheet above referred to by the upward thrust of vertical rods passing through holes 10 provided in the mould.

The slab thus formed, still enclosed between the two sheets is placed upon the pile of slabs previously formed in a similar manner and preferably resting upon a suitable carriage or con-

veyor which finally is pushed beneath a hydraulic press for the purpose of effecting the simultaneous compression of the slabs at for example a pressure of 100 kgs. per square centimetre.

As a result of the application of the cushion 6 containing water upon the dry mixture 4 there is achieved a damping of the mixture of fibrous and cementitious materials by the hygroscopic effect, and thereafter there is produced a complete soaking of the mixture with water or liquid contained by the cushion as a result of the pressure exerted by the piston 8.

The surface of the metal sheet 2 is flat and smooth if the slab which it is desired to produce is to be flat. The plate may however, be provided with reliefs or depressions or it may be provided with undulations or it may be given any other convenient form according to the form of surface which it is desired to give to the slab to be moulded.

The flexible sheet 3 may be formed of thin sheet metal, or of Celluloid, rubberized fabric or the like and it serves to make possible the rapid detachment of the formed slab from the metal plate 2. In other processes usually employed up to the present the slabs are moulded upon a mould of sheet metal, marble or cement the surface of which is required to be suitably lubricated to make possible the detachment of the slab. In such case it is necessary that the slab shall be conditioned to a suitable extent in order to avoid breakage during detachment as a result of the quite substantial force which it is necessary to exert in order to overcome the resistance of the atmospheric pressure which opposes the separation of two rigid and substantially non-elastic plates which are in intimate contact with one another, through having been moulded one upon another. Consequently if the plate to be detached has not acquired a suitable mechanical strength it is liable to become broken under these circumstances. The insertion of the flexible sheet 3 serves to reduce and in fact substantially to annul the reciprocal surface contact, since this surface is reduced to a line forming the generatrix of the tangential contact between the cement slab and the flexible sheet which can be rolled on the slab and thus permits the immediate removal of the slab from the mould whilst ensuring a perfect surface for the slab.

Furthermore the moulding of dry material as contrasted with material which is already petrified results in very important advantages.

(a) Satisfactory removal of the slab from the mould can be achieved, it being understood that

even when the flexible sheet is employed, if the mixture is wetted or soaked to an excessive degree clinging of the material at a multiplicity of points will be liable to occur with the consequent spoiling of the surface of the finished slab.

(b) The proportioning of the constituents forming the slab composition may be effected with accuracy and ease and in such a manner as to ensure perfect uniformity throughout the thickness of the finished slabs.

(c) Slabs may be formed of a number of layers of various materials variously coloured without the risk of one material soiling the others.

(d) The slabs having a maximum mechanical strength can be produced by virtue of the fact that it is an easy matter to introduce into the mixture the exactly correct quantity of water or aqueous solution which is necessary, it being understood that an excess of moisture in a cementitious mixture reduces the mechanical strength obtained.

(e) There may be introduced with the greatest of ease into the water for wetting the mixture correct quantities of solutions of materials for rendering the cement impermeable or of preservative materials suitable for the preservation of the organic, vegetable or animal fibres which may be employed.

The perforated metal sheet 7 is intended to permit the escape of excess liquid contained in the cushion 6 and which is required to be absorbed by the mixture formed with the materials 4 when this liquid is expelled from the cushion as a result of the pressure due to the plate 8.

After the operation of compression, separation from the mould is at once effected and the slabs are placed upon conditioning tables suitably piled in conditioning chambers where they remain for about a week, and in such a manner that the removal of any part of the water or of the liquid necessary to ensure the setting and the hardening of the cement and for achieving the required maximum strength is prevented.

The process now to be described enables slabs to be produced of coloured cement and asbestos in a single colour throughout the whole thickness of the slabs as well as slabs formed of a number of layers between which the colours are varied. Thus there may be produced a thin superficial surface layer having for example a thickness of 1 mm. and formed of high quality coloured cement and this may be applied to a layer formed of hard cement and of a thickness of say 5-6 mm. In this latter case the superficial surface layer may be formed of a mixture of coloured cement and marble granules whilst the remainder of the slab may consist of a mixture of hard cement and asbestos fibres. The surface formed of cement and coloured marble granules after conditioning may be given a high polish with the aid of a suitable abrasive material in the same manner as that adapted in the polishing of natural marble. Naturally it will be understood that this superficial surface layer formed of coloured cement and marble granules may be moulded with a single colour or with a plurality of colours in imitation of natural marbles or geometric and other designs in many colours may be produced with the aid of moulds or stencils or masks according to various colours. Slabs may also be produced by the use of mixtures of wood fibre and cement with the addition of preservative materials to the water, such slabs being capable of utilisation in many industrial and commercial applications.

Similarly, there may be formed a layer of a mixture of coloured cement and granules, or of coloured cement and asbestos fibre, a further layer of cement and vegetable fibres, and finally a third layer of coloured cement and asbestos fibre in such a way that ply panels are produced having an internal layer of light material bases on vegetable fibres and outer or superficial layers which are compact and coloured and are formed on the basis of mixtures comprising marble granules or asbestos.

The improved process offers the great advantage that production can be varied to meet the conditions existing on the market since it permits ready changing without any inconvenience or lengthy cessation of work, of the colour and type of the slabs produced so that the necessity for creating large stores of each kind of slab and of the various colours, with the consequent locking up of capital, is avoided.

With the process according to the present invention a further very important process of manufacture is made possible, that is to say slabs with undulating surfaces for linings may be produced by following a process which is identical with that previously described with the exception that the surface of the sheet 2 instead of being flat, is provided with an undulating upper surface and the perforated metal sheet 7 is also similarly undulated.

For the production of slabs, which are either undulated or made up with patterned surfaces, and in order to avail oneself of the special and practical advantage of moulding the dry mixture on a flat, instead of on an undulated surface, the following method has been resorted to:

A flat metal plate, which is made to pass through a slot in the mould trough, is allowed to rest upon the undulated (or patterned) surface in the bottom of the mould. This flat metal plate is covered by a flexible sheet on which the dry mixture is being uniformly distributed, in the same way as for the formation of the flat slabs.

As soon as the material is formed, it is covered by the elastic cushion and the flat metal plate is taken away, through the slot.

Once the plate is pressed downwards and the concrete is raised in the same manner as said for the flat slabs by pushing forwards the conveyor, the new slab thus pressed can be added on to the pile ready to be hydraulically pressed.

It is obvious that the mixture instead of being completely dry, will contain so much humidity as it is necessary to cause the cement to set. In spite of the fact that the even distribution of the material will be somewhat difficult, the idea underlining the principle involved will be substantially the same.

In connection with the slabs thus pressed and which are specially indicated for wall covering, a very simple and rational device has been found, to provide the fixing media.

Normally the slabs as produced in any other manner are fixed on to the walls by screws passing through the entire depth of the slabs and which are most unsightly. In the new slabs instead it will be possible to sink in the depth of the soft and dry material the necessary hooks made of twisted iron or zinc wire (or small plates) which will stick out at the back of the slab and will provide a perfect fixing without defacing the outer surface.

In the present description nothing has been said about the formation of the material within

the mould, by a device that can be either manual or mechanic.

What I claim is:

1. A process of molding plates and the like of cement mixture comprising preparing the cement mixture and distributing it in the dry state in a layer over the bottom of a mold, placing over the layer of dry mixture a spongy layer saturated with aqueous medium, squeezing the spongy layer to force aqueous medium therefrom and cause said medium to be absorbed by the layer of dry cement mixture, removing the thus initially molded plate and spongy layer from the mold, and subjecting said plate and layer to further and greater pressure.

2. A process of molding plates and the like of cement mixture comprising preparing a plurality

of different cement mixtures and distributing them in the dry state and in layers over the bottom of a mold, placing over the layers of dry mixture a spongy layer saturated with aqueous medium, squeezing the spongy layer to force aqueous medium therefrom and cause said medium to be absorbed by the layers of dry cement mixture, removing the thus initially molded plate and spongy layer from the mold, and subjecting said plate and layer to further and greater pressure.

3. A process according to claim 1 in which particles of different colors are included in the cement mixtures to simulate marble in the product.

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