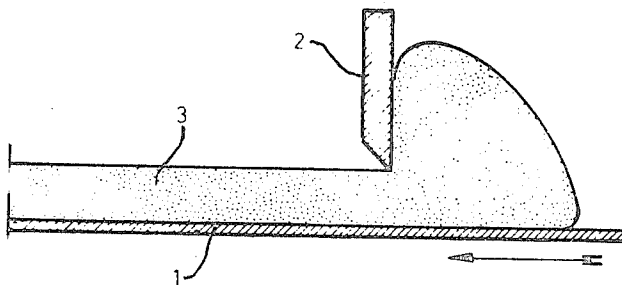


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[21] Appl. No. 788,804
[22] Filed Jan. 3, 1969
[45] Patented Oct. 26, 1971
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[32] Priority Jan. 19, 1968
[33] Sweden
[31] 765/68

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[54] PANELS FROM SETTLED PARTICLES LIQUID
BINDER AND ABSORBENT LAYER
2 Claims, 3 Drawing Figs.
[52] U.S. Cl. 156/62.2,
156/298, 264/111, 264/112
[51] Int. Cl. B29j 5/04
[50] Field of Search 156/62.2,
298; 265/111, 112

ABSTRACT: The invention is concerned with wall panels and other construction units comprising a mixture of solid particles and liquid resinous bonding agent, said mixture being distributed on a base in such a manner that the volume of bonding agent exceeds the volume of the spaces between said solid particles. The solid particles are now allowed to settle and the excess bonding agent is allowed to rise to the top of said solid particles so as to form an outer layer, into which one side of an absorbent layer is applied to absorb the bonding agent, which finally is cured. In this manner there will be obtained a strong composite construction unit having a smooth surface.



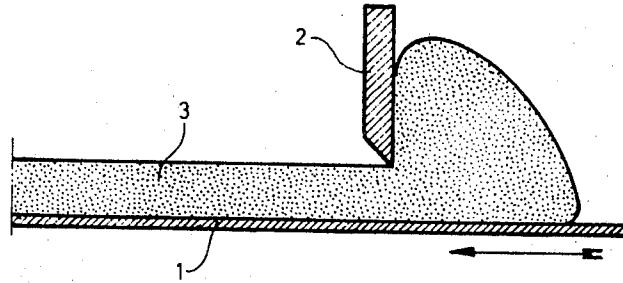


Fig 1

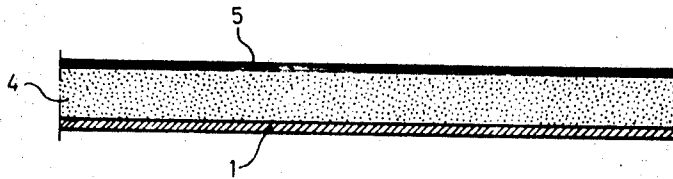


Fig 2

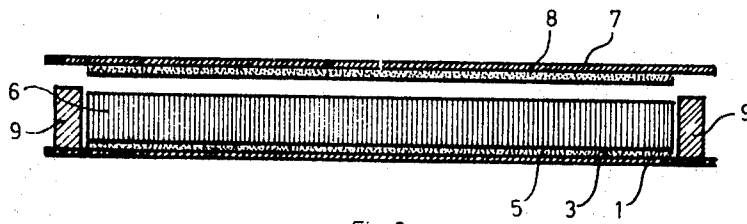


Fig 3

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PANELS FROM SETTLED PARTICLES LIQUID BINDER AND ABSORBENT LAYER

The present invention relates to the manufacture of flat or curved units, wall panels or the like for containers, silos, pipes, walls, roofs, floors or other building units, for example. A particular object of the invention is to manufacture units which are durable, tight, strong and relatively cheap to manufacture. According to the invention this is achieved by a combination of manufacturing steps including spreading out a mixture of solid particles and liquid resinous binder on a base, the quantity of said binder exceeding the volume of the spaces between the solid particles, subsequently allowing the solid particles to settle, forming from the excess binder an outer layer, inserting into said layer one side of an absorbent layer to at least partially absorb this excess and finally curing said binder in a suitable known manner.

According to one embodiment described, by way of example, with reference to the accompanying drawings in which

FIG. 1 shows a section of a layer of the panel during manufacture,

FIG. 2 shows this layer ready made and

FIG. 3 illustrates a later stage in the manufacture.

The manufacture may be carried out in the following manner:

A preferably uniform layer 3 of a mixture of liquid resinous binder and solid particles is spread by means of a scraper or doctor knife 2, or in some other way, onto a preferably flat, nonabsorbent base 1 (for example a sheet of stainless steel) treated with release agent. The quantity of binder should exceed the volume of the spaces between the solid particles. When the mixture has been spread out the solid particles settle on the base (FIG. 2) and at the same time air bubbles rise to the surface.

The time taken before sedimentation has taken place and the air bubbles have ceased to rise to the surface is, inter alia, dependent on the density and size of the solid particles and the viscosity and surface tension of the liquid binder. The excess binder rises to the surface and forms an outer layer 5. The outer layer 5 is now combined with an absorbent layer 6 (for example corrugated board placed transversely, FIG. 3) which is pressed down into the outer layer so that the excess liquid binder will be absorbed into the absorbent layer 6. On top of the absorbent layer 6 is now possibly applied a layer 8 with release agent applied on a reversed sheet 7, similar to the layer 3, 5, with the excess resinous binder 5 facing the absorbent layer 6 so as to cause the latter to absorb the resinous binder 5. When the resinous binder has cured a rigid hart product is obtained.

As is clear from FIG. 3, there are provided spacing runners 9 between the sheets 1 and 7 which, with sufficient accuracy, give the finished product the correct thickness and ensure that it will be parallel and flat.

In order to produce curved constructions, for example segments for cylinders, the layer 3 is spread as now described onto mouldable sheets on a flat base. When the layer 3 has settled, an intermediate layer or absorbent layer of sand mixed with a deficiency of polyester and curing agent is spread to the desired thickness on one of the sheets. The sheet is then shaped to the desired radius. When this has been done, the outer layer applied on the second sheet is placed on the top side of said absorbent layer. The absorption capacity of the absorbent layer must be such that it absorbs a suitable quantity of the excess liquid binder. If the absorbent layer has too great an absorption capacity, the settled part 4 is leached, which causes unsatisfactory adhesion between the layers. If the absorption capacity is insufficient, a layer will remain between the absorbent layer 6 and the settled layer 4. When the liquid binder has solidified, the intermediate layer obtained in this way will have greater shrinkage than the two other layers where shrinkage is practically eliminated. Shrinkage tensions thus arising may cause cracking and/or deformation.

The liquid resinous binder may consist, for example, of an isophthalic, phthalic, bisphenolic or other polyester together with a suitable curing agent, for example in the form of hexamethylenetetramine. These substances are only mentioned as examples which are suitable, and which, as is well known in the art, will harden or "cure" without the application of extra heat or pressure.

The solid particles may consist, for example of sand having, for example an average particle size of 0.15 mm., of the type "Baskarp-sand No. 7," cement, granular slag, metal powder or iron powder, etc. The absorbent layer may consist, for example of a mixture of sand with a deficiency of polyester or concrete or corrugated pasteboard (so-called "Tvarwell").

What we claim:

1. Method of manufacturing flat or curved units, wall panels or the like, comprising the steps of spreading out a mixture of solid particles and liquid resinous binder on a base, the quantity of said binder exceeding the volume of spaces between the solid particles, subsequently allowing the solid particles to settle and to form a settled layer of particles with binder therebetween, forming from the excess binder an outer layer, inserting into said outer layer one side of an absorbent layer to absorb at least partially said excess binder, and finally allowing said binder to harden.

2. Method according to claim 1, wherein a similar unit consisting of a settled layer of solid particles with binder therebetween and an outer layer of excess binder is applied on an other opposite side of said absorbent layer with the excess binder facing said opposite side, after which the binder is allowed to harden on both sides of the absorbent layer simultaneously.

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