

Feb. 20, 1934.

L. V. CASTO

1,947,459

PROCESS OF IMITATING SURFACES

Filed Feb. 29, 1928

2 Sheets-Sheet 1

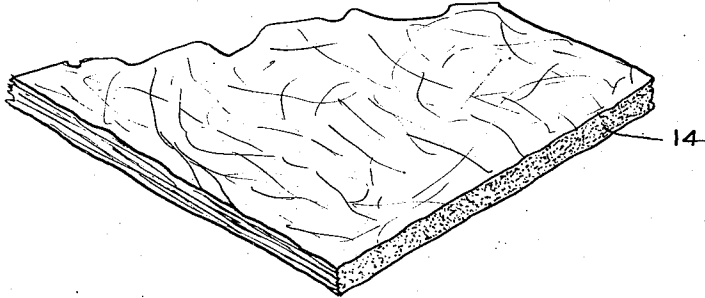


FIG.-1

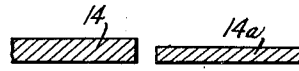


FIG.-3a

FIG.-3

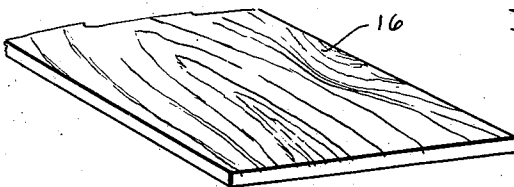
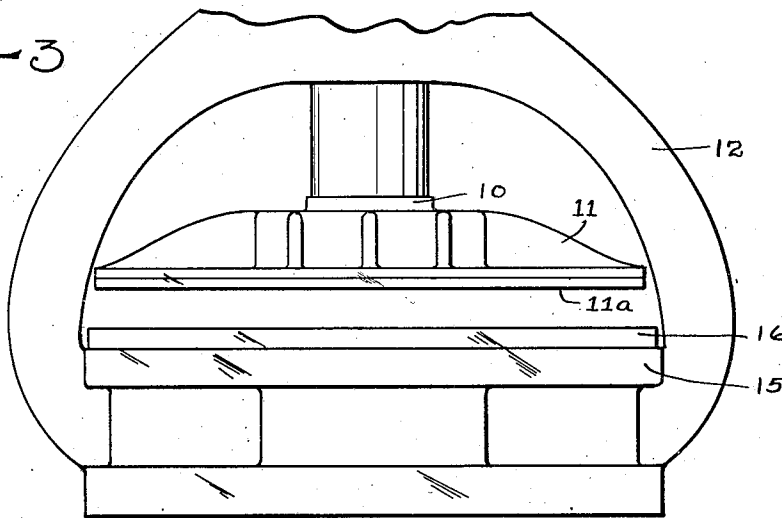


FIG.-2

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2 Sheets-Sheet 2

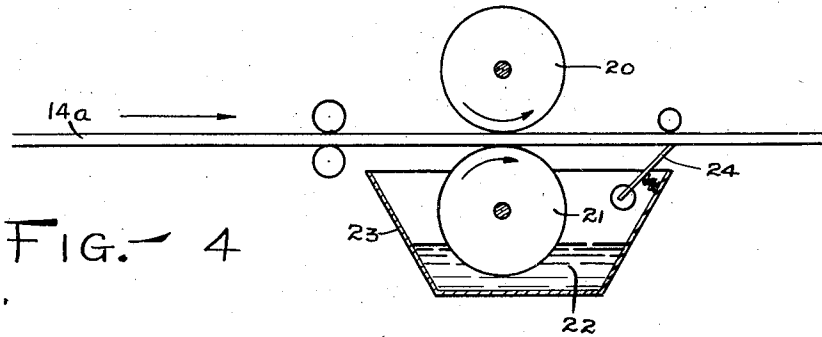


FIG.-4

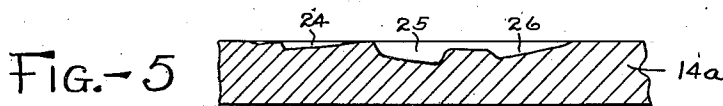


FIG.-5



FIG.-6



FIG.-7

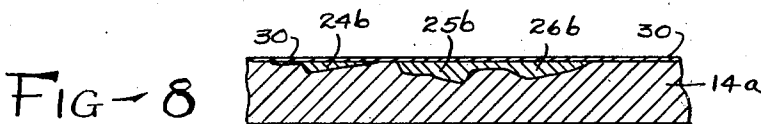


FIG.-8

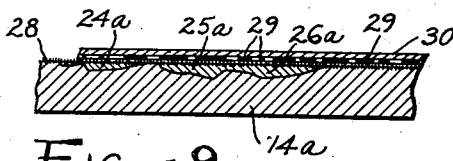


FIG.-9

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UNITED STATES PATENT OFFICE

1,947,459

PROCESS OF IMITATING SURFACES

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Application February 29, 1928. Serial No. 257,931

7 Claims. (Cl. 41—30)

This invention is concerned with the art of simulating the natural appearances of building materials, and other materials, and has for its general object the provision of a process of forming surfaces on partition and wall board such as plaster board, asbestos board, etc., whereby when the board is finished it will have the appearance of building material such as grained wood, marble, tile and the like.

More specifically, my invention is concerned with the provision of a process for finishing the surfaces of wall and partition board during the manufacture thereof, whereby the board surface may be completely finished and ready for installation in the building construction without necessitating any further painting, staining, varnishing, etc.

Other objects of my invention will hereinafter become apparent from the following description which refers to the accompanying drawings, illustrating a form of means for effectively working the steps of my process. The essential characteristics of the invention are summarized in the claims.

In the drawings, Fig. 1 is a fragmentary perspective view of a semi-manufactured wall board; Fig. 2 is a perspective view of an impression plate for effecting the formation of interstices in grain pattern upon the board during the process of its manufacture; Fig. 3 is a form of press in which the plate shown in Fig. 2 may be used to exert a final gauging compression on the semi-finished board illustrated in Fig. 1; Fig. 3a is a fragmentary section comparing finished and unfinished boards and illustrates the reduction in thickness which may be effected by the press; Fig. 4 is a diagrammatic representation of a machine adaptable for use in applying finishing materials to the surface of the body of the board after it has been completely formed; Fig. 5 is an enlarged cross sectional view of a portion of the board after having been formed in the press shown in Fig. 3; Fig. 6 is a view similar to Fig. 5 but showing the board with the surface interstices thereof filled to present a smooth surface; Fig. 7 shows one manner of completing or finishing the board surface by the use of a stain and a coating of transparent or translucent material such as varnish, etc.; Fig. 8 shows an alternate manner of completing the finished surface of the board; and Fig. 9 illustrates a form of my invention wherein two patterns are placed on the board.

My invention contemplates the treating of the material comprising the body of the plaster board

during the process of the manufacture of the board, and particularly at the time the board is being reduced from a semi-plastic to a hard consistency, or when the board is being reduced to gauge thickness. Wall board or partition board may be formed of various materials, usually fibrous in nature, such as asbestos board and wood pulp board, but other forms of board may comprise a layer or body of gypsum between thick paper layers, and for the purpose of setting forth one way of using my process I will explain the manner of its use in connection with the manufacture of asbestos board.

The mineral asbestos as is well known in its natural state, is a fiber in soft rock formation which is first treated by being disintegrated in such manner as to not destroy the elongation characteristic of the individual fibers, and these fibers are treated by the use of the usual paper process of flotation and screening to bring the material into a sheet form, which will have sufficient body to permit of its being handled during the final manufacturing steps of producing a hard board. These sheets are usually placed in a press and subjected to severe pressure, in some instances while in the environment of heat, to reduce the board to the desired hardness and gauge. An asbestos board produced in this manner has the appearance of resembling somewhat that of a gray plaster, but the color may be controlled to a certain extent by the introduction in the mixture comprising the body of the board of a coloring matter.

I propose to form in the surface of the board, as it is being subjected to the final forming pressure, interstices in the finished face thereof, which are prearranged in such form as to give a graining effect in simulation of the natural appearance of wood or the natural configuration or formation of the marble grain or vein usually present or observable in a slab of marble, and I thereafter fill these interstices with a plastic pigment or I may fill these pockets or surface openings with a plaster sufficiently dissimilar in its body structure from the body structure of the asbestos board whereby, when the board and filling are stained, a contrast corresponding to the natural contrast of colors in the material being imitated, will be presented. I may thereafter treat such ground surface in several ways to bring about the desired highly pleasing result in the appearance of the board surface.

In Fig. 3 of the drawings I diagrammatically show a press comprising a ram 10, carrying a head 11, which ram is supported on a frame 12. The

head 11 may have a flat smooth surface 11a adapted to be lowered into contact with a semi-finished board mat 14 shown in Fig. 1 by a hydraulic ram or other suitable press mechanism to press the board uniformly throughout its extent downwardly upon a bed 15 which supports a surface plate 16, and I prefer to form either the surface 11a of the head 11 or the exposed surface of the plate 16 in cameo relief obtained by either a reverse photogravure process or other satisfactory etching process to bring about this relief formation of the desired design or grain contour, so that when the semi-finished mat 14 is compressed between the bed 15 and head 11 of the press, one surface thereof will have formed in it, interstices, conforming in design and contour to the configurations and outline of the cameo or relief of the plate surface 16. During this operation the thickness may be reduced as shown by a comparison of the semi-finished board 14 and the finished board 14a in Fig. 3a. This completes the manufacture of the board, and I thus effect the first step in my process of the board finishing in an incidental manner during the final step of manufacturing the usual plain finished asbestos board.

The next step of my invention comprises treating the board surface with a plastic medium or pigment, whereby all of the interstices will be filled, and I remove all surplus filler material so that a smooth surface is presented, the configurations or grains being preliminarily represented or displayed by reason of the pigment filling the interstices in contrast to the natural appearance of those portions of the board surface which had not been indented, pocked or intersticed.

In Fig. 4 I show conventionally an apparatus for conveniently filling the interstices of the board. The board 14a may be passed between a pressure roller 20 and a resilient roll 21, which is adapted to rotate in a bath 22 of a pigment disposed within a tray or container 23, comprising a part of the machine frame. The roller 21, as the board is passed between the two rolls, coats the entire surface of the under-intersticed side of the board and as the board moves from left to right a scraper 24 which may be resiliently mounted to contact with the surface of the board entirely across its width, serves to scrape off or remove all surplus pigment on the underside of the board, leaving only that pigment which has found its place in the interstices of the board surface.

In Fig. 5 I show on an enlarged scale and in cross section, a portion or a section of the board 14a with interstices 24, 25 and 26 formed in the surfacing thereof and their cavitory contours in the aggregate, define the major contour or outline of the design which it is desired to impart to the surface of the board being finished. It will be noted that these cavities vary in depth in accordance with the varying tonal effect to be ultimately produced by this process.

In Fig. 6 I show the condition of the board after it has been passed through the machine shown in Fig. 4 with the interstices 24, 25 and 26 now filled by slugs or bodies 24a, 25a and 26a of the pigment or plaster, or with material of whatever physical characteristics it is desired to use as filler for the board surface.

In Fig. 7 I show the smooth filled surface of the board 14a treated with a stain (indicated by the lines 28) which stain will vary in tone, depending upon the depth of the fillings in the cavities, and also vary where the stain is applied

to the normal surface of the board where no filling is presented.

In Fig. 8 I show an alternate finishing construction for the board 14a, wherein the fillings 24b, 25b and 26b have a predetermined color relative to the color of the material forming the body of the board, and accordingly where no stain is used but in both methods of finishing the board, the final step of my process is to seal the surface by the use of a transparent coating of varnish or lacquer or other transparent seal or coating 30, and in some instances a colored or translucent varnish or lacquer may be used.

In Fig. 9 I show another method of finishing the surface of the board, wherein the smooth, filled surface of the board is treated with a stain indicated by the lines 28 and thereafter, another graining pattern, shown at 29, is placed on the board by means of a resilient transfer roll. The surface may then be sealed with a clear lacquer, or similar substance, as in the previous examples. The method shown in this figure of the drawings is particularly suited to cases wherein it is desired to employ more than one color to finish the board.

I have found that a very satisfactory manner of forming the engraved relief surface on the impression plate 16 is to select a slab of natural material, such as wood, marble, tile, etc. for the desirability of its appearance, and by proper treatment thereof condition such surface whereby it may be effectively photographed to produce a negative film. I may then use this film with a suitable screen, known as a reverse Rembrandt screen, for producing a carbon resist, which resist becomes a positive, and when used as an etching mat on the surface of the plate 16 will produce a negative or cameo or relief etching, the degree of relief depending upon the full tone, half tone, quarter tone, etc., graduations of exposure of the original negative, and conversely of the carbon resist. If desired, however, the use of a screen may be omitted, but I find that the screen produces a block etching in relief on the plate surface, the plate thus forming minute pockets of varying depths in the surface of the board being finished. The varying depth of the interstices thus formed in the board greatly assists in the reproducing of the full tones, half tones, quarter tones, etc., and furthermore, the block formation assists in retaining the material in the interstices of a board thus formed, but it is to be understood, that my invention is not limited to the use of a photogravure process for the reproduction of a cameo relief but any suitable process or method may be utilized without departing from the spirit of my invention.

In forming so-called gypsum board and plaster board, the board may be treated in the manner described, or if desired, a pressure roll may be formed with the surface thereof in relief after the manner hereinbefore set forth, and the indentations or interstices may be formed in the board by passing it between a pair of pressure rollers, and thereafter the board treated in the manner described to bring about the application thereto of pigment or semiplastic contrasting colored material to accentuate the grains or grain effect on the board surface. When it is desired to produce a finish involving the use of more than one color, the process illustrated in Fig. 9 may be employed and a separate engraved plate and transfer roll may be used to produce a second layer or grained pattern 29 over the first pattern but in a different color in the manner

set forth in my co-pending application Serial No. 163,200 on a marbelizing process which has become United States Patent No. 1,682,067, issued August 28, 1928.

According to the process set forth in this patent an etched plate is formed from the design to be reproduced by a photographic process in such manner as to obtain a reverse reproduction of the original image. From this plate a transfer of the design is made by means of an elastic roll to the surface to be coated, and then other transfers in different colours are superposed on, but out of register with the first transfer. By a like method I may superpose a design in a different colour on a plaster board having a surface preliminarily prepared in the manner described herein.

It will be obvious to those skilled in the art that my method of thus treating the board in the course of its manufacture may be economically applied in the finishing of the board, and highly satisfactory results may be obtained without necessitating the use of expensive skilled building labor. It will also be apparent to those skilled in the art, that the filler material used for filling the interstices of the board surface should have a co-efficient of expansion conforming somewhat to the co-efficient of expansion to the material forming the body of the board, whereby the use of this process and the introduction of the addition of material of the board surface will not tend to warp the board under varying humidity conditions.

It will be obvious to those skilled in the art that the present process may be utilized to reproduce tile effects, the mortar joints being represented by depressed fillings and the individual tile thus represented may each have a distinctive surface design of its own, all represented by filled depressions in the manner hereinabove set forth.

I claim:

1. A process for effecting a simulation of the surface appearance of building slabs, comprising forming a slab of plastic-material, subjecting the material before it has hardened to pressure against a surface bearing an ornamental design, which will form in the surface of the material interstices of predetermined contour and depth while the material is being hardened by such pressure, and subsequently filling the interstices thus formed with a material having different physical characteristics than the material forming the body of the slab to thus present a smooth uniformly flat surface.

2. A process for effecting a simulation of the surface appearance of building slabs, comprising forming a slab of plastic-material, subjecting the material before it has hardened to pressure against a surface which will form in the surface of the material interstices of predetermined contour and depth while the material is being reduced to uniform gauge thickness by such pressure, and subsequently filling the interstices thus formed with a dissimilar material.

3. A process for effecting a simulation of the

surface appearance of building slabs, comprising preparing a surface having an ornamental design impressed thereon in relief, forming a slab of material, subjecting the material thus formed to pressure against said surface thereby forming in the surface of the material a cameo of interstices of predetermined contour and depth while the material is being hardened and reduced to gauge thickness by such pressure, and subsequently filling the interstices thus formed with a material of contrasting color relative to the body color of the material forming the slab, and coating the surface thus formed with a protective transparent material.

4. The art of forming building material panels, comprising subjecting the semi-formed panel to pressure to reduce it to gauge size against a reverse intaglio surface to thereby form in the surface of the panel before the panel has hardened, a design simulating the surface appearance of natural building materials, and subsequently filling the interstices thus formed in the panel surface with a material dissimilar to material forming the body of the panel to accentuate the design or grain outlined by the depressions.

5. The art of forming building material panels, comprising subjecting the panel to pressure against a reverse intaglio surface to thereby form in the panel surface a depressed design, the contour of which simulates a grain outline of the natural surface to be reproduced, filling the interstices thus formed in the panel surface with a material dissimilar to the material forming the body of the panel, staining the surface thus filled to accentuate the design, superposing on the surface thus prepared a second grain outline by the use of a resilient roller and engraved plate or roll, and finally sealing the surface with a protective coating.

6. The art of forming building material panels, comprising subjecting the panel to pressure against a reverse intaglio surface to thereby form in the panel surface a depressed design, the contour of which simulates a grain outline of a natural surface to be reproduced, filling the interstices thus formed in the panel surface with a material dissimilar to the material forming the body of the panel to accentuate the design or grain outlined by the depressions, superposing on the surface thus prepared a second grain outline by the use of a resilient roller and an engraved plate or roll, and finally sealing the surface with a protective coating.

7. The art of forming panels of artificial material, comprising subjecting the panel to pressure against a reverse intaglio surface to thereby form in the panel surface a depressed design, the contour of which simulates the grain outline of the natural surface to be reproduced, filling the interstices thus formed in the panel surface with a pigmented material, and superposing on the surface thus prepared a second grain outline of different color.

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