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G. B. HINTON

PROCESS FOR MAKING CELLULAR CEMENTITIOUS MATERIALS

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Fig. 1.

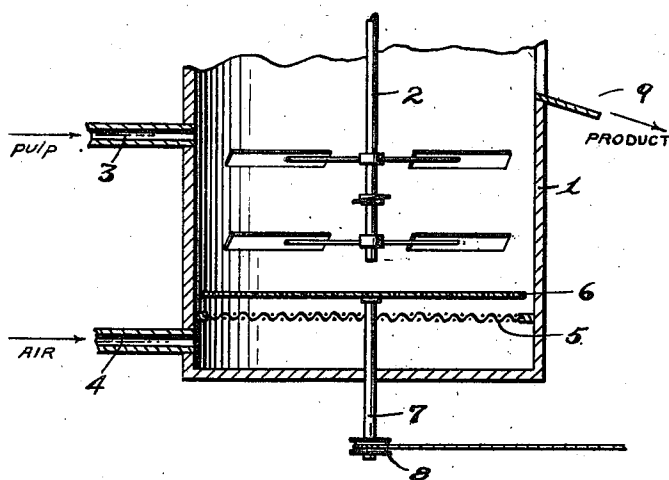
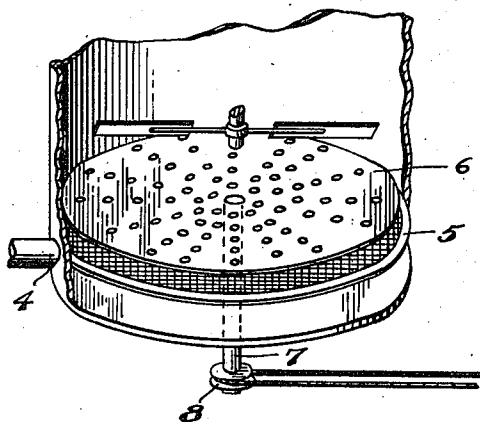


Fig. 2.



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PROCESS FOR MAKING CELLULAR CEMENTITIOUS MATERIALS.

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This invention relates to processes of preparing cellular cementitious materials and it comprises a process in which a pulp of cement, containing a frothing flotation reagent is agitated in a tank into which air, advantageously in fine streams is introduced, the air stream being continuously intercepted or cut as it comes into contact with, and enters, the pulp, so that bubbles or volumes of air of relatively small size are initially introduced into and made a part of the pulp.

My invention is directed to that process of forming cellular cementitious materials in which a pulp of such materials is aerated with a stream of air, in making of which products it is highly desirable that the bubbles or cells in the set product be of small size.

My improvements reside in a process by which small bubbles are initially formed in the pulp so that agitation of the pulp is primarily for the purpose of mixing the bubbles with the pulp rather than to also subdivide the bubbles.

I have found, that porous or cellular cementitious materials can be easily and readily prepared by introducing air into a pulp undergoing agitation in the presence of a flotation oil to give a product containing small bubbles providing the entering air stream is intercepted or cut as it enters the pulp so that large bubbles are precluded from forming therein. Thus by my invention, the bubbles, as they enter the pulp, are initially of small size so that the action of the agitator is primarily to mix in the bubbles, the subdivision thereof having been already taken care of.

Reference is directed to the accompanying drawings which show by way of illustration one advantageous type of apparatus for carrying out my process.

In the drawings:

Fig. 1 is a cross section of an assembled apparatus,

Fig. 2 is a fragmentary view of the air intercepting mechanism.

Referring more particularly to Fig. 1, a tank 1 is provided for the reception of the pulp to be aerated, an agitating device 2, being disposed therein. The pulp to be treated is introduced into the tank through the inlet 3, and air inlets, in the bottom of the tank, are shown at 4. Over the inlets, perforated plates 5 are positioned to break

up the air into fine streams. Just above the screens 5, there is disposed a rotating perforated disc 6 which is keyed to a shaft 7 having a pulley 8, or other means to rotate the shaft. The finished aerated material tumbles over the side of the tank through the trough 9.

Fig. 2 illustrates in perspective the position of the perforated disc 6 with respect to the bottom of the tank, the air inlets 4 and the perforated plates or canvas 5.

It is obvious that other means may be employed to intercept the air streams. A rapidly revolving knife-bladed cutter can be used in place of the perforated disc shown. In another modification, a perforated cylinder may be used, in this case, the whole apparatus being horizontally disposed with the pulp inside the cylinder. Or, if desired, the perforated cylinder can be arranged in a vertical position, the air inlets then being along the sides of the tank with the cylinder in close proximity to the wall of the tank.

I do not regard my invention as being restricted to any particular type of apparatus. I regard it broadly new with me to intercept the air stream as it enters the pulp for the purpose of controlling the size and number of bubbles introduced without depending upon the agitation as such of the pulp to subdivide the bubbles.

In the absence of means to intercept or cut the air stream after it passes through the canvas or perforated plate and just before or just as it comes into contact with the pulp, the air on the pulp side of the canvas or plate builds up to form large sized volumes of air. There is comparatively little movement of the pulp at this point because of the high viscosity of the pulp so that the movement of the pulp itself is insufficient to chop off the bubbles formed as the air stream passes through the plate 5.

By means of a rapidly rotating perforated disc, or other suitable means, however, the air streams formed are immediately intercepted or sliced so that small separated bubbles enter and mix with the slurry. The size of the bubbles can be regulated by the speed of rotation of the disc.

What I claim is:

1. In the process of making set cellular cementitious products by aerating a pulp of cement in the presence of a frothing flotation reagent, the steps which comprise ini-

tially forming small bubbles of air of substantially the size desired in the final set product in the pulp of cement from an entering air stream and then mixing said bubbles with said cement pulp without substantial change in size of the bubbles.

2. In the process of making set cellular cementitious materials, the steps which comprise bringing a stream of air into contact with a pulp of cement, rapidly intercepting the entering air stream as such intermediate the point of introduction of the air stream and the point of contact thereof with the pulp and at all times independently of any agitation or movement of the pulp, so as to initially form small segregated volumes of air in said pulp, and mixing said volumes of air with said pulp.

3. In the process of aerating a pulp of cement in the presence of a frothing flotation reagent to form set cellular products, the step which comprises rapidly intercepting the aerating air streams as such at a point intermediate the point of introduction of the air stream and the point of contact

thereof with the pulp and at all times independently of any agitation or movement of the pulp so that small bubbles of air are initially formed in the pulp.

4. In the process of making set cellular cementitious materials, the steps which comprise bringing a stream of air into contact with a pulp of cement, rapidly intercepting the entering air stream as such and at all times independently of any agitation or movement of the pulp, so as to initially form small segregated volumes of air in said pulp, and mixing said volumes of air with said pulp.

5. In the process of aerating a pulp of cement in the presence of a frothing flotation reagent to form set cellular products, the step which comprises rapidly intercepting the aerating air streams as such and at all times independently of any agitation or movement of the pulp so that small bubbles of air are initially formed in the pulp.

In testimony whereof I have affixed my signature.

GEO. B. HINTON.