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INTRODUCTION OF REAGENT IN FROTH FLOTATION

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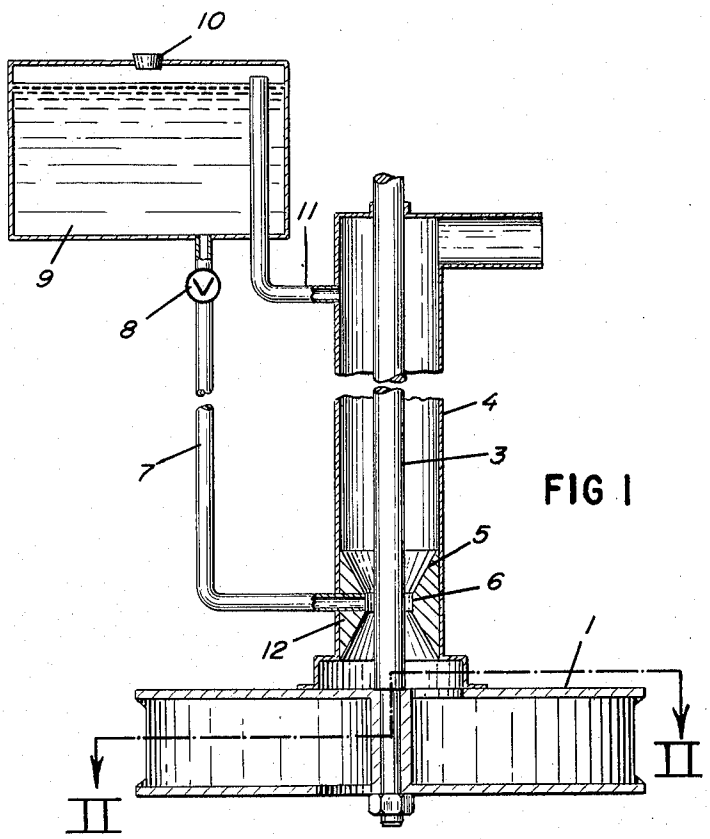

FIG 1

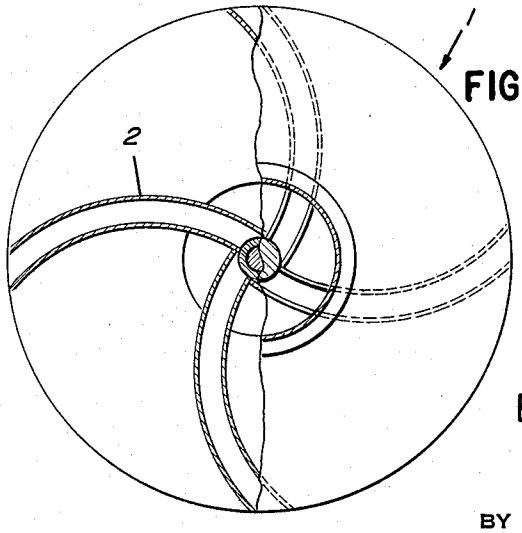

FIG 2

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INTRODUCTION OF REAGENT IN FROTH FLOTATION

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5 Claims. (Cl. 259—23)

This invention relates to the dispersion of a liquid and a gas particularly useful in froth flotation cells.

In froth flotation cells one tries to obtain a homogeneous diffusion of the reagent in the pulp, the expression "the reagent" extending in the present text to the case where several reagents are used. This diffusion must be such that the reagent presents a maximum surface of contact when introduced in the pulp, so as to reduce, as much as possible, the time necessary for its action on the latter.

The known processes of reagent feeding do not comply with these conditions as the reagent is not introduced directly into the pulp and the homogenisation is only obtained after a rather long contact between the pulp and the reagent.

The object of the present invention is a process which enables the drawbacks of the known processes to be remedied by introducing the reagent into the pulp in an extremely divided state, thus ensuring a maximum contact surface.

It consists essentially of finely dividing a stream of reagent by compressed gas for the introduction of reagent into a froth flotation cell.

Following a specially desirable embodiment of the invention, the pulverisation is effected by a venturi tube located on the compressed gas inlet tube, the reagent distributing tube emerging after the neck of the venturi tube.

Following another desirable embodiment of the invention the venturi tube is located at the end of the air inlet tube, the latter emerging in the agitator of the flotation cell.

The accompanying figures give an indicative and non-limitative example of embodiment of the invention. FIG. 1 is a side cross-sectional view of apparatus for practicing the present invention, and FIG. 2 is a section following II—II of FIG. 1.

A rotating agitator **1** with hollow blades **2** is mounted on a rod **3** fitted so as to rotate and is adapted to be immersed in a body of pulp or the like (not shown). A fixed tube **4** is placed concentrically around rod **3**. It includes at its lower end a venturi tube **5** whose neck **6** includes an opening **12**. One end of a tube **7**, of section smaller than that of tube **4** is fixed to opening **12** and the other end is located in a tank **9** closed by a sealing plug **10**. On tube **7** a regulating valve **8** is fitted. Above the level of the reagent in the tank, one end of a tube **11** emerges, the other end of which communicates with the part of tube **4** located ahead of venturi tube **5**.

This being so, the operation takes place as follows: The air compressed, for example, by a compressor, not represented, is fed by tube **4** and passes into venturi tube **5**, thus creating a difference of pressure between the neck of the venturi tube **6** and the part of the tube **4** located before the venturi tube, the pressure near the neck being the lower one. In tank **9**, cut off from the atmosphere by sealing plug **10**, the air above the reagent level is

directly connected by tube **11** with the higher pressure, i.e., with the part of tube **4** located before the venturi tube. The reagent is delivered by this pressure into tube **7**, passing through regulating valve **8** which enables the output to be limited, then into neck **6**. The current of air finely divides the reagent and then the mixture passes into hollow blades **2**, which distribute same into the pulp itself. The rod **3** is rotatively driven by any means, not represented.

The advantage of the present device is to mix more quickly and homogeneously reagent, air and pulp. The finely divided form producing a maximum surface, the efficiency is thus greater. When using air as vehicle for the reagent the simultaneous contact of the particles with the reagent and air, and the increased output resulting therefrom permits an appreciable diminution of the consumption of reagent.

It is evident that without exceeding the scope of the invention, similar embodiments may be devised, permitting similar results to be obtained.

For instance, the agitator may be vibrating with a hollow driving shaft used as air feeding tube. Or the agitator may consist of two rotors, one creating the pulp agitation, the other diffusing the air-reagent mixture.

What is claimed is:

1. A method of introducing reagent into a first body of liquid in a froth flotation, comprising establishing a second body of liquid reagent, directing a gas beneath the surface of said first body, said gas being under a first elevated pressure along a portion of its path of travel, accelerating the velocity of said gas along another portion of its path to produce a second pressure lower than said first pressure, establishing communication between said gas at said first pressure and a region above the surface of said second body, and establishing communication between said gas at said second pressure and said second body below the surface thereof thereby to inject a continuous stream of liquid reagent from said second body into said gas at accelerated velocity to finely divide said injected liquid reagent.

2. A method as claimed in claim **1**, in which said liquid reagent is injected into said gas at a substantial angle to the path of said gas.

3. Apparatus for introducing reagent into a first body of liquid in a froth flotation, comprising means for directing a gas beneath the surface of said first body, said gas being under a first elevated pressure along a portion of its path of travel, means for accelerating the velocity of said gas along another portion of its path to produce a second pressure lower than said first pressure, means establishing communication between said gas at said first pressure and a region above the surface of a second body of liquid reagent, means establishing communication between said gas at said second pressure and said second body below the surface thereof thereby to inject a continuous stream of liquid reagent from said second body into said gas at accelerated velocity to finely divide said injected liquid reagent, said means for directing comprising an agitator, means for moving the agitator with the agitator disposed beneath the surface of said first body of liquid, said means for moving the agitator comprising a shaft, and said means for accelerating the velocity of said gas comprising an annular venturi encompassing and spaced from said shaft.

4. Apparatus as claimed in claim **3**, the latter-named said establishing means opening into said gas through a portion of said venturi.

5. Apparatus as claimed in claim 4, said portion of said venturi being the portion of said venturi having the smallest internal diameter.

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