United States Patent [19]

Petterson

[11] **3,905,766**

[45] **Sept. 16, 1975**

[54] **METHOD FOR THE LIQUID TREATMENT OF, PRIMARILY, CELLULOSIC PULP**

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[73] Assignee: **Sunds Aktiebolag,** Sundsvall, Sweden

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[21] Appl. No.: **476,076**

Related U.S. Application Data

[63] Continuation of Ser. No. 850,923, Aug. 18, 1969, abandoned.

[30] **Foreign Application Priority Data**

Sept. 18, 1968 Sweden 12572/68

[52] **U.S. Cl.** ..... **8/156;** 68/181 R; 162/199; 162/272

[51] **Int. Cl.²** **D21D 5/02**

[58] **Field of Search** ..... 162/60, 251, 199, 272; 8/156; 68/18 F, 181 R; 210/412

[56] **References Cited**

UNITED STATES PATENTS

1,214,152	1/1917	Genter	210/412 X
3,622,262	11/1971	Leffler	68/181 R X

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Assistant Examiner—Philip R. Coe
Attorney, Agent, or Firm—Pierce, Scheffler & Parker

[57] **ABSTRACT**

In withdrawing liquid from cellulosic pulp by a procedure comprising passing a column of a slurry of the pulp to be dewatered through a cylindrical vessel, in one direction, and flowing the liquid towards a chamber for withdrawn liquid, said chamber having a pervious wall immediately adjacent said column, it is desirable — in the interest of preventing clogging of the pervious wall — intermittently to interrupt inflow of liquid into said chamber by pressure variations induced by a gaseous fluid into the top of said chamber.

2 Claims, 3 Drawing Figures

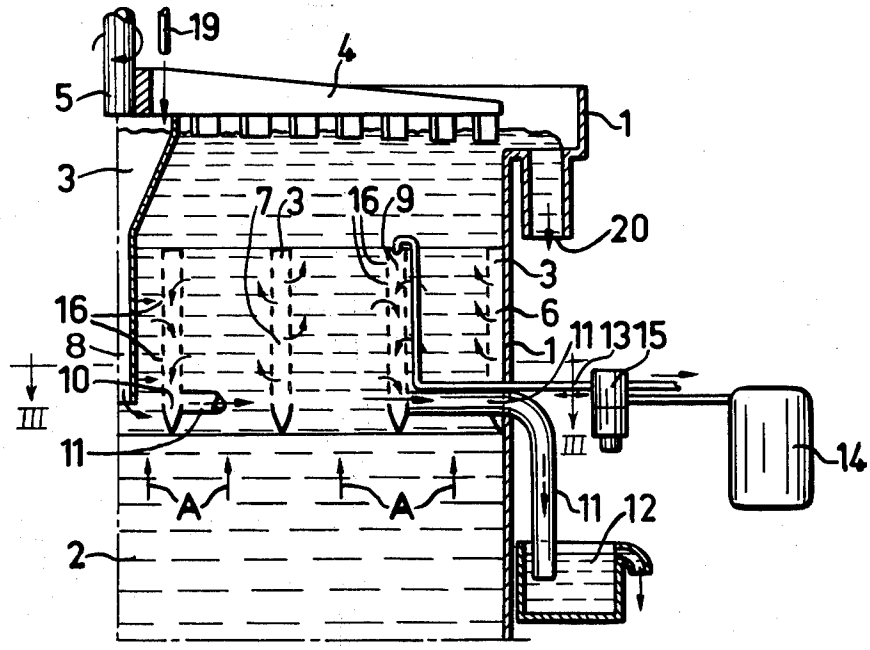


FIG.1

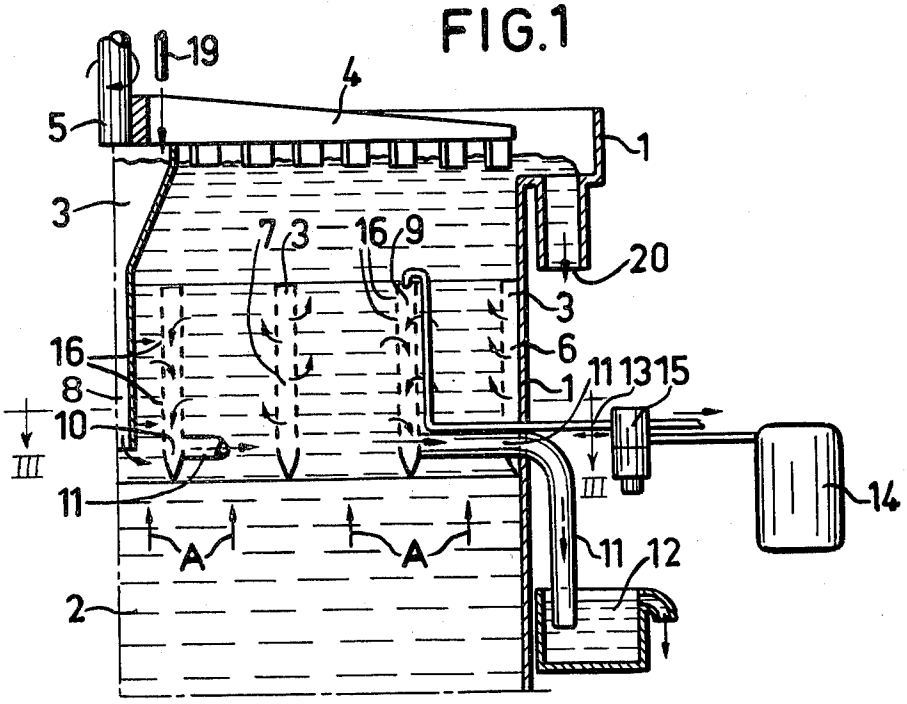

19
4
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1
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16
9
20
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1
11
13
15
III
III
11
14
A
A
11
12
2

FIG.2

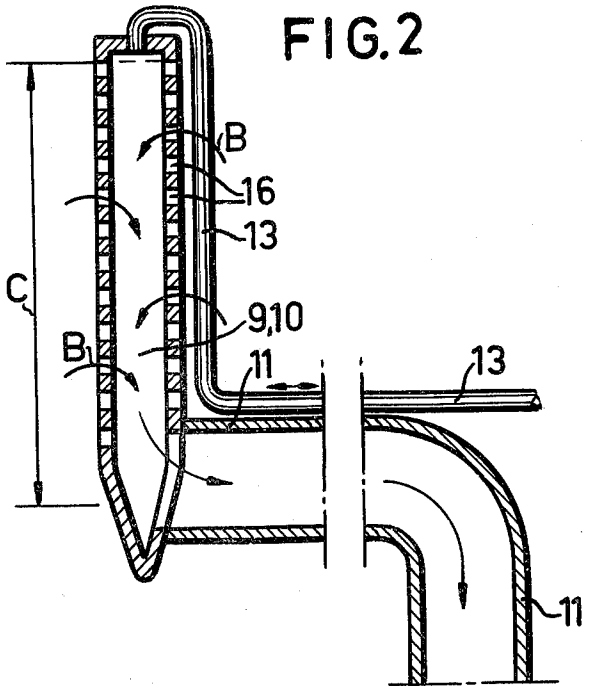
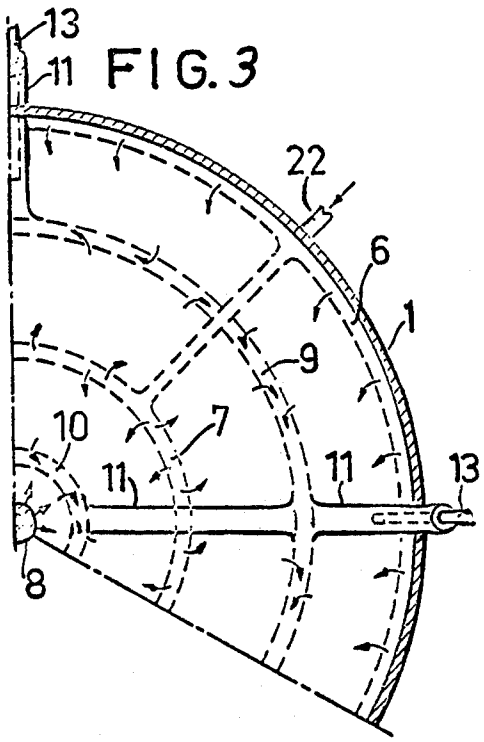

B
16
13
C
9,10
B1
11
13
11

FIG. 3



METHOD FOR THE LIQUID TREATMENT OF, PRIMARILY, CELLULOSIC PULP

This is a continuation, of application Ser. No. 850,923 filed Aug. 18, 1969, and now abandoned.

The U.S. Pat. Nos. 3,622,262 and 3,729,961 relate to a method of and, respectively, an apparatus for the liquid treatment, primarily, for the washing (but also for the displacement and dewatering) of material, primarily fibrous material, suspended in a liquid and fed through a preferably upright container of suitably cylindrical shape in the axial direction of said container, said treatment being carried out in that part of the container which is filled with the material, the treatment liquid being caused to flow through the suspension of material from at least one supply chamber for the treatment liquid towards at least one collecting chamber for withdrawn liquid, said collecting chamber having a pervious wall. In the method in question the influx of the withdrawn liquid into the collecting chambers is interrupted, entirely or partly, at suitable intervals, in order to prevent clogging of the pervious walls of the collecting chambers and/or to facilitate the travel of material past or along said surfaces. In that connection it has been proposed to generate the pressure variations through the intermediary of a fluid, primarily water.

It has now been found that, in accordance with an advantageous, further development of the above described way of proceeding, it is possible to use a gas, for instance air, as the medium for transmitting the pressure variations. A considerable advantage of using, for instance, air as the medium for transmitting the pressure variations consists therein that the acceleration forces, acting on the impulse medium, will be of an entirely different order than if using, for instance, water because the volumetric weight of air at an atmospheric pressure of 1 and at a temperature of 0° C amounts to only about 1/800 of the volumetric weight of water. Furthermore, because of the lower density of the impulse medium (gas, air) and/or the longer time of impulse that can be used (the time factor is not critical at the impulsation), a more uniform distribution of pressure is obtained. Finally, a higher speed of reflux and a higher effective speed of drainage of the liquid can be obtained.

The invention will be explained in greater detail in the following description, reference being had therein to the accompanying drawing, in which FIG. 1 shows a vertical sectional view of part of an apparatus suitable for the practical use of the invention, the apparatus being connected to an upright container for the treatment of fibrous material, FIG. 2, in a vertical sectional view and on an enlarged scale, showing that part of the device which is connected to the gas- (air-) pulsator. FIG. 3 is a cross-sectional view, taken on line III—III of FIG. 1, showing how the supply of liquid is introduced and caused to flow substantially tranversely of the direction of flow of the suspension; how liquid is withdrawn; and how gas is supplied.

Numeral 1 indicates part of the upper portion of an upright, preferably cylindrical container, adapted to be continuously traversed by material to be treated, preferably cellulosic pulp 2, in the direction indicated by the arrows A. The entire room for introducing the treatment (washing) liquid is indicated by 3 and numeral 4 indicates a surface skimming means of a known kind stationarily mounted on a rotary shaft 5. Numerals

6, 7 and 8 indicate supply chambers for washing liquid, which chambers may be stationarily and/or rotatably mounted in a known manner, for instance, in the manner appearing from the disclosure of Swedish Pat. No. 198,496 corresponding to U.S. Pat. No. 3,372,087. Also, they may be embodied in a manner known per se, for instance, in the way shown in the just mentioned Swedish Patent No. 198,496. Numerals 9 and 10 indicate collecting chambers for withdrawn liquid, said chambers being preferably devised as hollow annular sieves, as shown in FIG. 3. With the collecting chambers 9 and 10 there communicate one or more pipes 11 for leading away the withdrawn liquid by way of an overflow 12. With the collecting chambers 9 and 10 there also communicate at least one pipe 13, which is connected to a means for generating pressure variations by means of a gas, primarily air. The means in question comprises a container 14, to which gas (air) is to be supplied. Within the pipe 13 there is provided a solenoid valve 15, controlled by, for instance, a time relay. Said time relay alternately connects the collection chambers with the pressure container 14 and with the atmosphere, respectively. The genreated pressure variations produce a flow of gas (air) and/or liquid through the slots or holes 16 in the walls of the collecting chambers 9 and 10 which prevents clogging of said holes 16 and thus facilitates the collection of the withdrawn liquid (indicated by arrow B). The limits of the level of liquid in the sieve is marked in FIG. 2 by a double arrow C. At the highest level only liquid and at the lowest level only gas flows through the holes 16. A conduit 19 leads washing liquid to space 3, 8, while conduit 22 supplies annular spaces 6 and 7. Washing liquid flowing from spaces 8, 6 and 7 flows transversely through the column of suspension towards spaces 9 and 10 in which spaces withdrawn liquid is collected and led away through pipes 11.

What is claimed is:

1. In a method for withdrawing of liquid from a fibrous material suspended in a liquid and fed through a generally upright container, in the axial direction of said container, said container being, in the part where the withdrawal is carried out, filled with the suspension, involving the steps of flowing the liquid towards at least one chamber for collecting withdrawn liquid, said chamber being positioned within the suspension and said chamber having a pervious wall, subjecting said pervious wall to the action of pressure variations which at least partially interrupt the influx of withdrawn liquid into said collecting chamber, thereby preventing the clogging of the pervious wall of the collecting chamber and facilitating the travel of material past or along said surface, the improvement which consists in producing said pressure variations through the intermediary of a gas, said gas being transmitted through a conduit into the top of the collecting chamber and being subjected to pressure impulses, free passage of said gas being maintained in said conduit and in the top of said chamber thereby obtaining rapid transmission of the pressure impulses to the surface of liquid collected in said collecting chamber.

2. In the improved method according to claim 1, characterized in flowing a treatment liquid substantially transversely of the direction of flow of the suspension from at least one means for supplying treatment liquid, said means being positioned within the suspension, towards said at least one chamber for collecting withdrawn liquid.

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