April 2, 1940. J. C. F. C. RICHTER 2,195,680

APPARATUS FOR CONTINUOUS TREATMENT OF WOOD PULP, CELLULOSE, AND SIMILAR MATERIAL WITH BLEACHING LIQUID, ALKALI, OR OTHER CHEMICALS

Filed Dec. 1, 1936 2 Sheets-Sheet 1

Fig. 1.

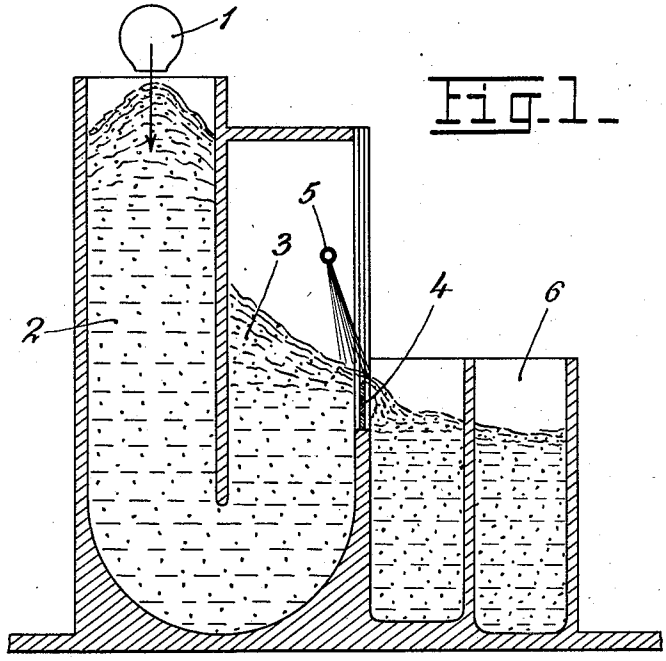
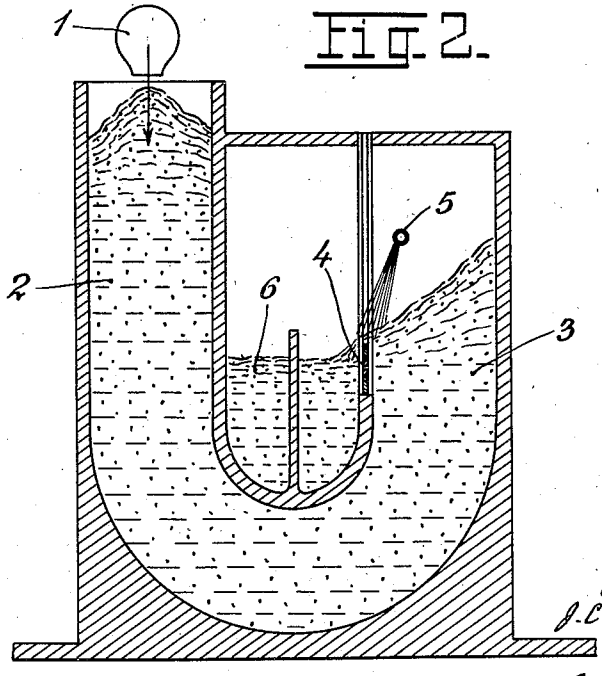


Fig. 2.



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Fig. 3.

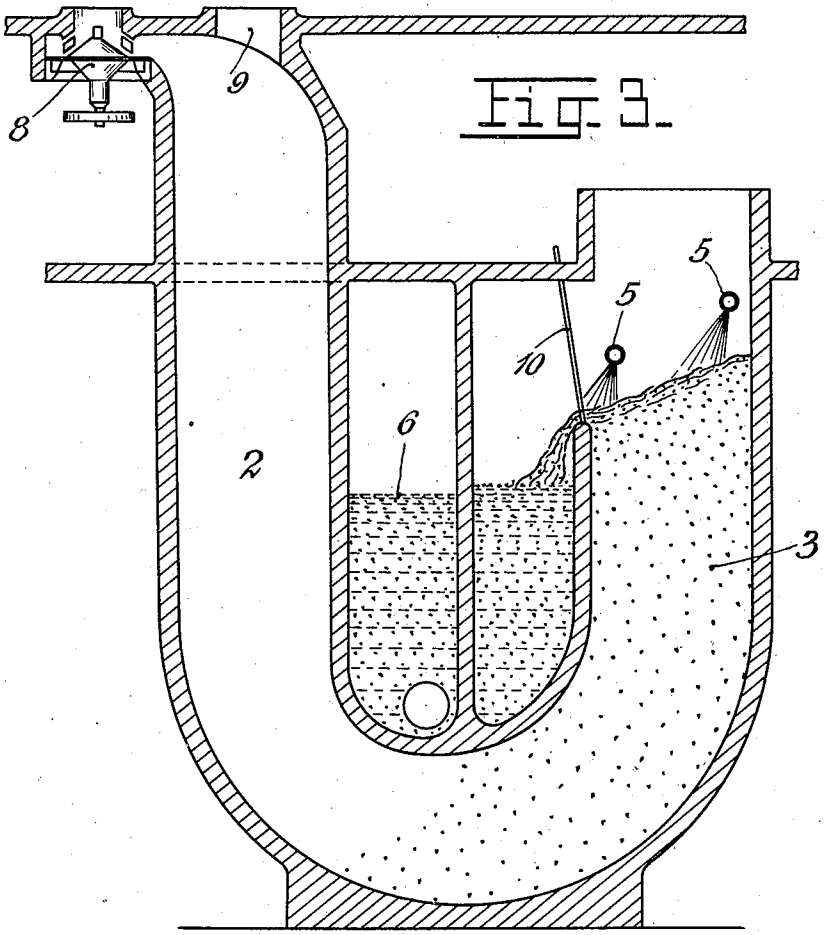
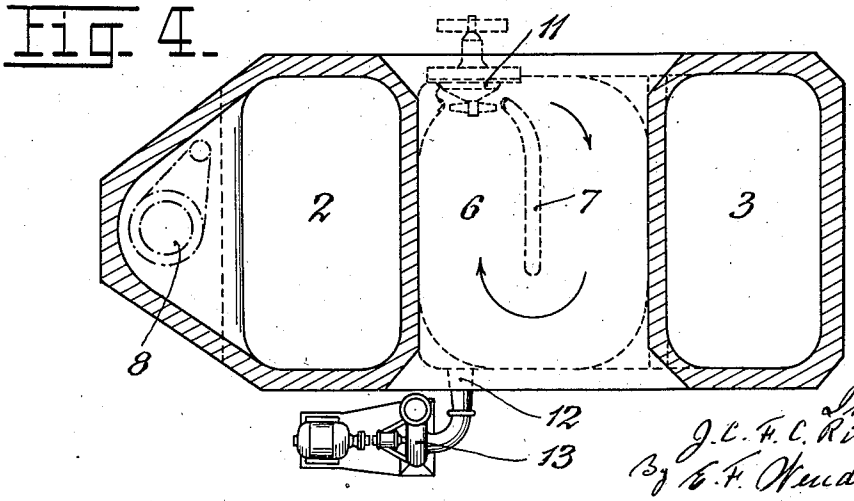


Fig. 4.



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APPARATUS FOR CONTINUOUS TREATMENT OF WOOD PULP, CELLULOSE, AND SIMILAR MATERIAL WITH BLEACHING LIQUID, ALKALI, OR OTHER CHEMICALS

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Application December 1, 1936, Serial No. 113,722
In Sweden December 9, 1935

2 Claims. (Cl. 92—7)

The present invention has for its object an apparatus for continuous treatment of wood pulp, cellulose and similar material, and the purpose of the invention is to provide an apparatus of this type, in which the treatment can take place continuously without the necessity of conveyors, scrapers, stirring devices or similar movable parts in the apparatus. Particularly the invention relates to the treatment of stock having a medium consistency, i. e., from 5 to 12 or 14% dry material.

In accordance with the invention, the apparatus comprises a U-shaped channel having two vertical or inclined sections interconnected at the bottom with a curved section of substantially the same cross section.

The material to be treated is introduced at the top of one channel after having been mixed with the necessary chemicals, and the material then passes through the whole U-shaped channel, rising in the other section of the channel to a level which is dependent on the consistency of the material.

The channel section in which the material moves upwards is provided with an overflow, which may be adjustable, as well as with a device for supplying liquid for continuously removing material which has passed downwards through the first section of the U-shaped channel and upwards through the second section.

Some preferred embodiments of the invention are diagrammatically illustrated on the drawings.

Figures 1 and 2 are diagrammatical cross sections of two different forms, whereas Figures 3 and 4 show cross section and plan view of a third embodiment.

In accordance with the embodiment illustrated on Figure 1, 1 is a mixing device of suitable construction for mixing the material with the chemicals with which it is to be treated. 2 and 3 are two channels, which may have circular or polygonal cross section and which are interconnected at their lower ends by means of a curved channel having the same cross section. The mixture of material and chemicals is continuously supplied at the top of channel 2 and let out continuously at an overflow 4 in the side wall of channel 3. In the upper part of channel 3 there is located a water supply tube 5. From the overflow the material passes into a storing tank 6, the object of which is to equalize the variations in the flow of material which may occur owing to variations in the velocity of the mass passing through the channel.

In accordance with the form illustrated on Figure 2, the two parts 2 and 3 of the U-shaped channel are spaced from each other in order to obtain the smoothest possible passage through the apparatus, whereby it is obtained that the difference of level in the two passages may be kept low.

In accordance with the embodiment illustrated on Figure 2 the adjustable overflow 4 opens into the space between channels 2 and 3, in which the storing tank is located. The two channels 2, 3 need not necessarily be perpendicular, but may also be inclined at a certain angle, provided the angle of inclination is sufficiently big to allow for automatic adjustment of the difference in level between the material in the two sections of the channel irrespective of the friction during the movement of the material through the apparatus.

In accordance with the form illustrated on Figures 3 and 4 there is provided at the top of channel 2 a pump 8 for thick pulp, this pump providing an additional pressure, which is in some cases necessary with highly concentrated material in case the static pressure difference between the two parts of the channel should not be sufficient.

The material may be supplied to channel 2 either through pump 8 or through an ordinary filling opening 9.

Instead of the adjustable overflow 4 there is illustrated another type comprising a grid or screen, through which the material is removed by means of the jets 5.

The pressure in channel 2 is automatically adjustable by means of the centrifugal pump, so that the material rises to a suitable level for being driven through the lower part of the screen. The storing tank 6 is divided in two parts by means of a central wall 7, about which the material is circulated by means of a circulation pump 11. The material is removed from tank 6 through an outlet pipe 12 by means of pump 13.

In all forms of the invention it is important that the cross section of the channel is large and uniform, and it has been found preferable to have cross sections of at least 3 to 4 m^2.

I claim:

1. An apparatus for continuous treatment of wood pulp, cellulose and the like with chemicals, such as bleaching liquid, alkali or the like, comprising a substantially vertical U-shaped channel with large, substantially uniform unobstructed cross section and devoid of mechanical conveying devices, one section of the said U-shaped channel being provided at the top with means for supplying material and chemicals, the

other section being provided at the side facing the first section with an overflow for continuously removing the material treated, said overflow being located substantially below the top level in said first section, a storing tank for the treated material formed by and being located in the space between the two sections of the U-shaped channel.

2. An apparatus for the continuous treatment of wood pulp, cellulose and the like with chemicals, such as bleaching liquid, alkali or the like, comprising a substantially vertical U-shaped channel having a large, substantially uniform unobstructed cross section, the inner walls of said channel forming a storing tank for the treated material, one section of said channel being provided at the top with means for supplying material and chemicals and the other section being provided at a lower level with an overflow directed so as to empty into said tank whereby the material being treated may flow by gravity from said means for supplying material to said overflow.

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