Aug. 3, 1948. H. L. HORN 2,446,418

ELECTROLYTIC APPARATUS FOR USING BAGASSE TO MAKE PAPER PULP

Filed July 13, 1944

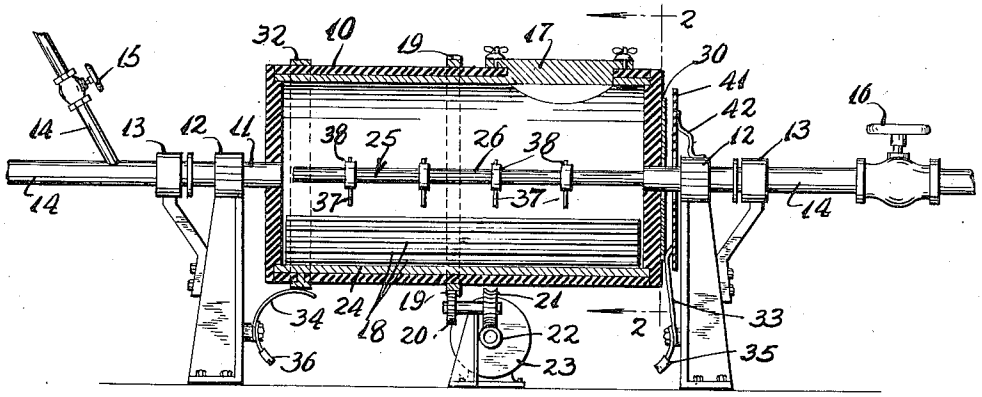


Fig. 1.

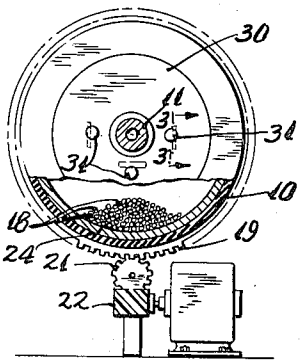


Fig. 2.

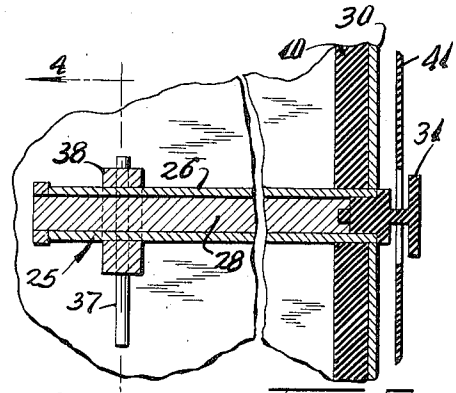


Fig. 3.

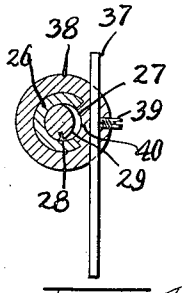


Fig. 4.

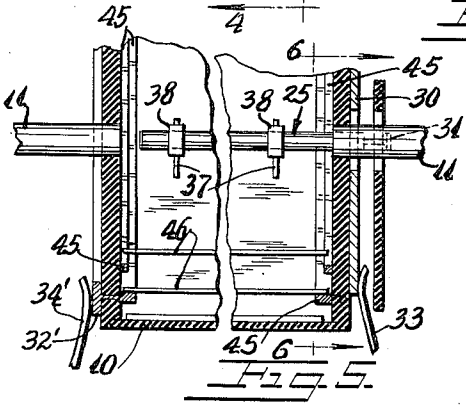


Fig. 5.

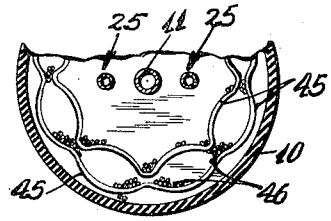


Fig. 6.

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ELECTROLYTIC APPARATUS FOR USING BAGASSE TO MAKE PAPER PULP

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Application July 13, 1944, Serial No. 544,806

2 Claims. (Cl. 204—213)

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This invention relates to new and useful improvements in an apparatus for carrying out a method for using bagasse to make paper pulp. This invention is an improvement on the invention disclosed in my Patent No. 1,779,971 granted October 28, 1930. This invention also relates and is similar in subject matter to the subject matter of a method application Serial No. 544,807 filed on July 13, 1944, and simultaneously with this application.

An important object of the invention relates to an improvement in the mechanism for carrying out the electrolytic process of the apparatus. More specifically, it is proposed to provide the container which holds the electrolyte and the bagasse to be treated, with certain rigid electrical conductors arranged longitudinally of the container and upon which electrodes are mounted. It is proposed that the current flow from these electrodes through the electrolyte to an interior shell of the container.

The invention also proposes a novel construction for holding the electrodes in proper positions.

Still further the invention proposes a modification in which the circuit through the container is varied. Specifically, it is proposed to have the current flow from the electrodes through the electrolyte to the electric conductor rods in the container and from the rods to supporting tracks and a collector ring.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a longitudinal sectional view through the apparatus for carrying out a method for using bagasse to make paper pulp in accordance with this invention.

Fig. 2 is a transverse vertical sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary enlarged vertical sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a fragmentary vertical sectional view taken on the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary longitudinal sectional view similar to Fig. 1 but illustrating a modified form of the invention.

Fig. 6 is a fragmentary transverse sectional view taken on the line 6—6 of Fig. 5.

The apparatus for carrying out the new and improved method for using bagasse to make paper pulp, in accordance with this invention, includes a rotative electrically insulated container 10 for electrolyte and for the bagasse to be treated. This container 10 is shown constructed of insulation material. It is supported by a pair

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of end pipes 11 which are coaxially connected with the ends of the container and which are rotatively supported in bearings 12. The pipes 11 connect with swivel joints 13 by which they are connected with stationary pipes 14. These stationary pipes 14 are provided with control valves 15 and 16. Through said pipes 14 it is possible to supply the container 10 with the necessary electrolyte, the necessary chemicals, and the necessary steam and other fluids used in carrying out the method for treating the bagasse.

The container 10 is provided with an opening closed by a removable cover 17. A plurality of rods 18 of electric nonconductive material are arranged within the container 10 and are for the purpose of beating the bagasse. The container 10 is provided with an external ring gear 19 which is engaged by a gear 20 connected with a worm wheel 21 engaging the worm 22 on the shaft of an electric motor 23 by which the container 10 may be rotated.

A metallic shell 24 serves as a lining for the side walls of the container 10. A plurality of rigid electrical conductors 25 extend longitudinally of the container 10 and are mounted on one of the ends of said container. Each rigid electrical conductor 25 includes an outer tube 26 which is open along one side, presenting the opening 27, and an interior rod 28 which has a flattened side 29. The rods 28 extend through the end wall of the container 10 and electrically connect with a collector ring 30 mounted upon the outside face of the wall of the container. Each rod 28 is provided with an insulation handle 31 by which it may be turned. Another collector ring 32 is mounted about the container 10. An electric circuit is provided for supplying electric current to the collector rings 30 and 32, and this circuit includes brushes 33 and 34, respectively engaging the collector rings 30 and 32. These brushes 33 and 34 are connected with the leads 35 and 36 of the electric circuit.

Electrodes 37 are adjustably mounted on the rigid conductors 25. Each electrode 37 is mounted through a side portion of a collar 38. A set screw 39 holds each electrode 37 in an adjusted position on said collar 38. The collar 38 is slidably mounted on the outer tubes 26 of the rigid conductors 25. Each collar 38 has an internal projection 40 engaging into the side openings of the outer tubes 26 of the electric conductors 25. As illustrated in Fig. 4 each collar 38 is free to be shifted longitudinally upon the tube 26. When said collars are placed in suitable positions, the rods 28 are turned by turning the handles 31 so that the flattened sides of the rods are moved away from the opposed projecting portions 40 of the collars 38. The rods 28 when turned engage against the internal projections 40 and so lock the collars 38 in position.

A guard of insulation material 41 is supported

by a bracket 42 upon the casing of one of the bearings 12, and engages across and covers and guards the collector ring 30 so that this element can not be accidentally touched.

The operation of the apparatus is as follows: The bagasse to be treated is placed within the container 10 by first removing the cover 17. The cover is then replaced. Suitable electrolyte, steam, chemicals and other ingredients are brought into contact with the bagasse within the container and the process carried out substantially identical to that described in my prior patent mentoned, supra. However, the present apparatus differs from the prior one in the way it carries out the electrolytical process of the method for treating the bagasse.

In this form of the invention electric current from the brush 33 enters the collector ring 30 and then flows along the rigid conductors 25. From the conductors 25 it proceeds to the electrodes 37 and through the electrolyte to the shell 24. Since the shell 24 is connected with the collector ring 32, the current proceeds to the brush 34 and to the other lead of the electric cricuit.

A feature of the invention resides in the fact that the electrodes 37 may be extended or retracted in relation to the collars 38, and the collars 38 with said electrodes may be shifted along the lengths of the rigid conductors 25 to desirable positions. With this arrangement the electric current will flow through the electrolyte from the several electrodes 37. The electric current will more uniformly react with the electrolyte and more uniformly carry out the electrolytic step of the process.

In Figs. 5 and 6 a modified form of apparatus has been disclosed which is very similar to the prior form, distinguishing merely in the fact that the electrically insulated container 10 is not provided with a metallic lining. Instead its end walls are provided with a track system 45 for supporting metallic rods 46 loosely in groups. In this form of the invention the rods 46 are metallic so as to be good electrical conductors, contrasted with the first form of the invention in which the rods 18 are of insulation material. One of the tracks 45 is connected with a collector ring 32' mounted upon the outer face of one end of the container 10. This collector ring 32' is engaged by the brush 34'.

In other respects this form of the invention is similar to that previously shown and like reference numerals identify like parts in each of the several views.

The operation of this apparatus is very similar to the prior form, distinguishing in the path of the electrical current through it. The current will flow from the brush 33 to the collector ring 30, and then to the rigid electric conductors 25. From these conductors, the current proceeds to the several electrodes 37, then through the electrolyte to certain of the metallic rods 46. From these rods 46 current flows to one of the tracks 45 and the collector ring 32'. With this arrangement it is not necessary for the insulation container 10 to have a metal lining. In other respects the electric process functions substantially in the same way as previously described.

It is to be understood that this apparatus may be used for making paper pulp and paper products of all kinds.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. In an apparatus for carrying out a method for using bagasse to make paper pulp, a rotative electrically insulated container for electrolyte and for the bagasse to be treated, tracks on the inner sides of the ends of said container for loosely supporting rods, rods of electrically conductive material for beating said bagasse extended horizontally between the ends of said container and mounted on said tracks, rigid electric conductors extending longitudinally within and mounted on one of the ends of said container, collector rings connected respectively with one of said tracks and with said conductors, an electric circuit for supplying electric current to said current collector rings, and electrodes adjustably mounted on said rigid conductors, each of said rigid conductors comprising an outer tube having a longitudinal opening along one of its sides, and an internal turnable rod having a flattened side and disposed in said tube, and collars mounted upon said rigid conductors and having internal projections slidable through said open sides and engageable by said rods, said electrodes being mounted on said collars.

2. In an apparatus carrying out a method for using bagasse to make paper pulp, a rotative electrically insulated container for electrolyte and for the bagasse to be treated, tracks on the inner sides of the ends of said container for loosely supporting rods, at least one of said tracks being of electrically conductive material, rods of electrically conductive material extended horizontally between the ends of said container and mounted on said tracks for heating said bagasse, rigid electric conductors extending longitudinally of and mounted on one of the ends of and within said container, current collector rings on the outside of the container and connected respectively with one of said tracks and with said conductors, an electric circuit for supplying electric current to said collector rings, and electrodes adjustably mounted on said rigid conductors, each of said rigid conductors comprising an outer tube having a longitudinal opening along one of its sides, and a rod having a flattened side enclosed by said tube and turnable therein, and collars mounted upon said rigid conductors and having internal projections engaging through said longitudinal opening and engageable by said rods, said electrodes being mounted on said collars, and set screws for holding said electrodes in various extended positions from said collars.

HARRY L. HORN.

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