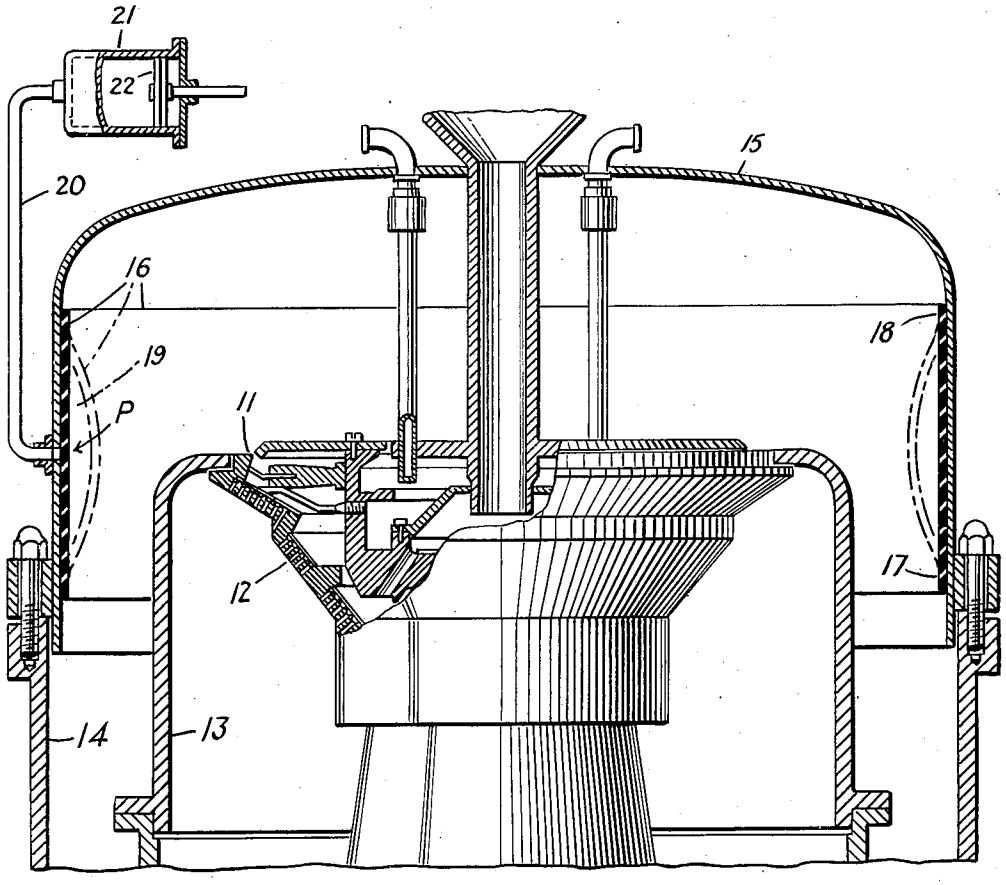
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CENTRIFUGAL SEPARATOR

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CENTRIFUGAL SEPARATOR

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3 Claims. (Cl. 210—73)

The present invention pertains to the centrifugal dehydration of solids and relates particularly to the provision of a centrifugal separator of improved construction designed to effect removal of liquid from solids. An example of a separating operation for which the machine of the invention is especially suitable is the separation of mother liquor from crystals formed by the cooling of such liquor. This invention relates to an improved machine for effecting such a dehydrating step in an operation involving removal of the liquor by centrifugation, followed by continuous or frequent intermittent discharge of solids from the centrifugal rotor.

A difficult problem has been encountered in the operation of machines of the prior art designed to perform separating functions of this character, in that the solids discharged from the centrifugal rotor have had a tendency to adhere to surfaces which they strike after such discharge. In many cases, solids discharged build up progressively in the form of a cake to such an extent as to block further discharge of solids from the rotor. The present invention relates particularly to a machine designed to avoid this tendency of discharged solids to adhere to impacted surfaces, and an important feature of the invention consists in the fact that it provides an economical means of avoiding this difficulty.

The problem of crystal stickage is solved in the machine of the present invention, by providing a flexible and deformable member in the line of discharge of solids from the rotor. This member is periodically deformed to break loose crystals which may adhere to it, thereby avoiding accumulation and cementing together of such crystals.

The invention can be best understood by consideration of the attached drawing, in which the single figure illustrates the part associated with the rotor and upper end of a centrifugal separator of the invention, the view being partly in cross section and partly in side elevation. Referring to the drawing by reference characters, a rotor 10 is illustrated which affords a plurality of successive separating stages. The general features of design of the machine by which the solids are dehydrated and discharged from the upper end 11 of the rotor may be of any known character, but these features are preferably similar to these illustrated in the prior patent to L. P. Sharples, No. 2,095,206. The dehydrated solids are preferably discharged from the rotor by means of a plurality of plows 12 which are arranged at an angle to the wall of the rotor and rotated at a speed slightly different from that of the rotor in order to discharge the solids in a manner well understood in this art. Reference is made to the patent to Brewer, No. 1,991,490 for a more detailed description of the construction and principle of operation of plows of this character. Features of rotor and plow design form no part of the present invention.

A stationary casing 13 surrounds the rotor and receives liquid discharged therefrom through opening 12 provided in the wall of the rotor. A second casing 14 surrounds the casing 13, and this casing 14 is provided with a cover 15 through which conduits for feeding material to be treated and rinse liquid are passed to the rotor. If the special arrangement constituting the feature of the present invention were not provided, solids discharged from the upper end 11 of the rotor would strike the cover 15 at about the point indicated by the arrow P, and a large part of these solids would adhere to the cover at this point, gradually accumulating until they might even reach the outer edge of the rotor. In order to avoid this difficulty, I secure an annular strip 16 of deformable, and preferably also elastic, material to the cover 15 at the normal zone of annular discharge of solids against that cover. Thus, an elastic strip of vulcanized rubber may be bonded to the cover at the points 17 and 18, as illustrated, in order to form a fluid tight chamber 19 surrounding the zone of solids impingement against the annular strip 16.

Means are provided for periodically flexing the strip 16, in order to forcibly dislodge solids which may strike this strip and adhere thereto. While any suitable means may be employed to accomplish this end, I have illustrated in the drawing an arrangement in which the chamber 19 is connected by a conduit 20 with the cylinder 21 of a fluid pressure motor provided with a slowly reciprocating piston 22. As the piston 22 moves to the left, it forces air from the cylinder 21 into the space 19, thereby causing the flexible strip 16 to be moved from the full to the dotted line position of the drawing. This movement causes dislodgment of solids, and prevents their accumulation.

While the invention has been illustrated as applied to a flexible strip secured to the top 15 of the casing 14, and this illustration has included provision of fluid pressure means for deforming the strip, I wish it to be understood that this

is but one of a number of forms which the invention may take. The invention may be practiced by deforming a flexible deflector for the discharged solids by any suitable pneumatic or mechanical means, within the broad scope of the invention. Various modifications will be obvious to those skilled in the art, and I do not therefore wish to be limited except by the scope of the following claims.

I claim:

1. In a centrifugal separator, the combination including means for separating solids from liquids and for discharging said solids separately from said liquids comprising a centrifugal rotor from which solids are adapted to be discharged peripherally during rotation of the rotor, a deformable deflector mounted in the line of discharge of said solids, and means independent of said discharged solids for positively flexing said deflector to dislodge solids adhering thereto.

2. In a centrifugal separator, the combination including means for separating solids from liquids and for discharging said solids separately from said liquids comprising a centrifugal rotor from which solids are adapted to be discharged peripherally during rotation of the rotor, an elastic and deformable deflector mounted in the line of discharge of said solids, and means independent of said discharged solids for positively flexing said deflector to dislodge solids adhering thereto.

3. In a centrifugal separator, the combination including means for separating solids from liquids and for discharging said solids separately from said liquids comprising a centrifugal rotor from which solids are adapted to be discharged peripherally during rotation of the rotor, an annular deformable deflector mounted in the line of discharge of said solids, and means independent of said discharged solids for positively flexing said deflector to dislodge solids adhering thereto.

4. In a centrifugal separator, the combination including means for separating solids from liquids and for discharging said solids separately from said liquids comprising a centrifugal rotor from which solids are adapted to be discharged peripherally during rotation of the rotor, a deformable deflector mounted in the line of discharge of said solids, and means independent of said discharged solids for positively and periodically flexing said deflector to dislodge solids adhering thereto.

5. In a centrifugal separator, the combination including means for separating solids from liquids and for discharging said solids separately from said liquids comprising a centrifugal rotor from which solids are adapted to be discharged peripherally during rotation of the rotor, a fluid tight chamber provided with a deformable deflector surface mounted in the line of discharge of said solids, and means for passing fluid under pressure to said chamber for flexing said deflector to dislodge solids adhering thereto.

6. In a centrifugal separator, the combination including means for separating solids from liquids and for discharging said solids separately from said liquids comprising a centrifugal rotor from which solids are adapted to be discharged peripherally during rotation of the rotor, an annular fluid tight chamber provided with a deformable deflector surface mounted in the line of discharge of said solids, and means for passing fluid under pressure to said chamber for flexing said deflector to dislodge solids adhering thereto.

7. In a centrifugal separator, the combination including means for separating solids from liquids and for discharging said solids separately from said liquids comprising a centrifugal rotor from which solids are adapted to be discharged peripherally during rotation of the rotor, a fluid tight chamber having a wall consisting of an elastic deformable deflector mounted in the line of discharge of said solids, and means for forcing fluid under pressure into said fluid tight chamber for flexing said deflector to dislodge solids adhering thereto.

8. In a centrifugal separator, the combination including means for separating solids from liquids and for discharging said solids separately from said liquids comprising a centrifugal rotor from which solids are adapted to be discharged peripherally during rotation of the rotor, a fluid tight chamber having a wall consisting of an elastic deformable deflector mounted in the line of discharge of said solids, and means for intermittently forcing fluid under pressure into said fluid tight chamber for flexing said deflector to dislodge solids adhering thereto.

LEO D. JONES.