PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Method and Apparatus for the Centrifugal Treatment of Rubber Latex

We, AKTIEBOLAGET SEPARATOR, a Swedish Company, of Fleminggatan 8, Stockholm, Sweden, and GUSTAV HARRY ANDERSSON, a Swedish Subject, of Drottningholmsvägen 70, Stockholm, Sweden, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

This invention relates to a method and apparatus for the treatment of rubber latex and is concerned more particularly with the production of a rich rubber concentrate from rubber latex.

In the preparation of a rich rubber concentrate from rubber latex, by centrifugation, it has been customary hitherto to employ centrifugal bowls having intermediate discs. The use of bowls without such discs, which would in some ways be advantageous, is not possible owing to the fact that separation would be rendered difficult on account of the small dimensions of the rubber particles. During separation it is desired partly to get as many of the rubber particles as possible carried over to the concentrate, and partly to get a concentrate having the highest possible percentage of rubber.

When concentrating rubber latex in bowls with intermediate discs it is possible to obtain a concentrate with a high rubber content by employing a bowl of substantially the same construction as that used in a milk separator. It has, however, been found that the central part of the bowl eventually becomes clogged with a thick rubber concentrate, making it necessary to stop the separator periodically for cleaning.

The object of the present invention is to provide a method and apparatus by which it is possible to obtain, at the same high separating efficiency, a rich rubber concentrate, but in which the risk of clogging is reduced considerably as compared with methods previously employed. The method is based on the fact that the clogging starts at the inner edge of the discs, and that it gradually increases towards the outer edge.

Further it has been found that rubber latex concentrate of the percentage normally separated adheres readily to the intermediate discs but that rubber latex concentrate of a somewhat lower percentage does not.

For these reasons we have found it suitable to divide up the concentration process into two steps, both of which are carried out in the same centrifugal bowl.

The first step is carried out in a portion of the bowl which is provided with intermediate discs. The rubber latex is led into the pile of discs in the usual way through holes situated at a suitable distance from the inner edge of the discs. In the part of the pile of discs lying outside said holes the main part of the rubber particles are separated from the liquid. The particles move along the surface of the discs towards the centre of the bowl. In the part of the pile of discs lying inside the inlet holes a concentration of the particles separated out in the outer part takes place. The dimensions are chosen in such a way that the concentration is not driven so far as to cause any danger of the particles adhering to the discs.

The second step is carried out in a space inside the pile of discs, in which a further concentration takes place and which is so arranged that the risk of the rubber concentrate adhering is much smaller than when using intermediate discs. We have found that a sufficient concentration is obtained without the use of intermediate discs in the said space, providing it is of suitable dimensions. In certain cases however, it is preferable to provide intermediate discs in this space also, but such discs differ from those used in the outer separating chamber in that they are arranged at a considerably greater distance apart. This can be effected in various ways, for example by employing thicker caulks on the discs. The risk of the rubber sticking to the discs can also be reduced in other ways, for instance by giving to the discs a larger top angle than that used for the discs in the separating chamber.

In order that the invention may be more clearly understood one particular

construction of bowl suitable for carrying out the method is shown in cross-section in the accompanying drawing.

The latex to be separated is fed into the bowl through the tube 1 and streams from there through the central element 2 into the space 3 from where it is led out through the holes 4 in the element 2 into the channel formed by the holes 5 in the intermediate discs 6. The separation takes place in the spaces between the discs. The part of the liquid more or less liberated of rubber particles is led into the chamber 7 and discharged through the channel 8. The part of the liquid containing the rubber particles, that is the concentrate, moves towards the centre and leaves the pile of discs at the inner edge 9. The final concentration is not carried out in the pile of discs but in the space 10 provided for the purpose inside the discs. This space extends radially from the inner edge 9 of the discs 6 to the outer surface of the central element 2 and vertically through the control hole in the pile of discs. In many cases the space 10 can, as shown in the drawing, be formed without any surfaces to which the concentrate can adhere; in other cases it may be preferable to provide the space with vertical radially directed lists or wings, serving as guiding lists for the discs or as conveying wings for the concentrate. In certain other cases the said space 10 is suitably provided with intermediate discs placed at considerably greater distance or of a larger top angle.

In the embodiment shown in the drawing the discharge opening 12 for the concentrate is situated at a greater distance from the axis of the bowl than the inner limit 11 of the space 10, whereby the concentrate can form a free liquid level at 13. This is advantageous as the viscous concentrate can move upwards more easily towards the discharge opening 12 if the liquid level is free than it could if it were possible for it to adhere to the surface 11. The increase in the concentration obtained in the space 10 is determined, for example, by the distance in radial direction between the disc edges 9 and the level 13, and the greater this distance the greater the increase in concentration. The concentration of the concentrate when leaving the pile of discs cannot be above a certain limit without the risk of clogging. If a considerably higher concentration is desired sufficient space must be provided inside the discs for the final increase in the concentration up to the value desired.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A method of preparing a rich rubber concentrate from rubber latex, by centrifugation in a centrifugal bowl provided with intermediate discs, characterised in that the concentrate separated out in the pile of discs is submitted to further concentration in a space inside the discs, in which the concentrate can freely move towards the discharge openings of the bowl.

2. A centrifuge when used for carrying out the method according to claim 1, characterised in that the space inside the discs extends radially from a point inside the outlets for the concentrate to a point outside said outlets and vertically through the central hole in the pile of discs and the liquid to be treated is led into the pile of discs through channels formed by superposed holes in said discs.

3. Method of preparing a rich rubber concentrate from rubber latex substantially as described and set forth.

4. Apparatus for use when carrying out the method according to Claim 1, substantially as described with reference to the accompanying drawing.

Dated this 18th day of September, 1935.

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