No. 832,837. PATENTED OCT. 9, 1906.

N. S. BÖK.

DISTRIBUTING DEVICE FOR CENTRIFUGAL SEPARATOR BOWLS.

APPLICATION FILED APR. 17, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

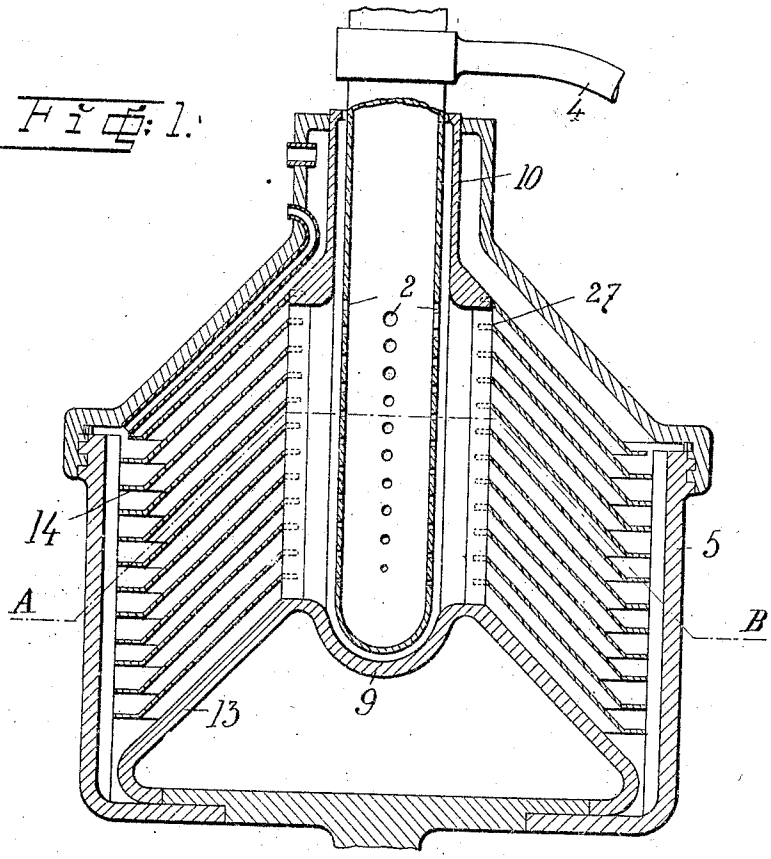
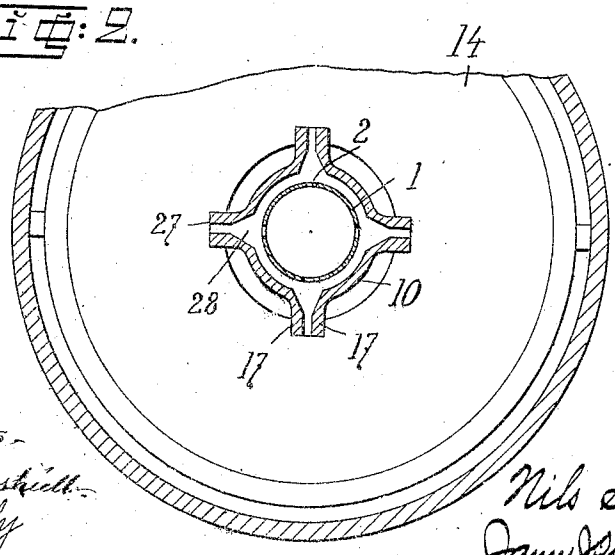


Fig. 2.



Witnesses.
Wm. C. Dashiell.
W. C. Healy

Inventor.
Nils S. Bök.
By James Shelby
Atty.

No. 832,837.

PATENTED OCT. 9, 1906.

N. S. BÖK.

DISTRIBUTING DEVICE FOR CENTRIFUGAL SEPARATOR BOWLS.

APPLICATION FILED APR. 17, 1905.

2 SHEETS—SHEET 2.

Fig. 3.

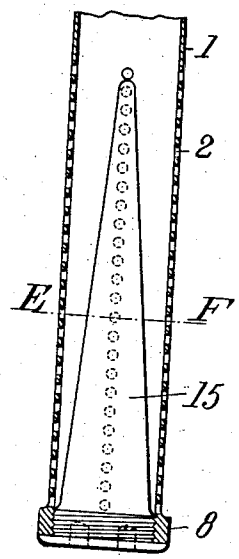


Fig. 5.

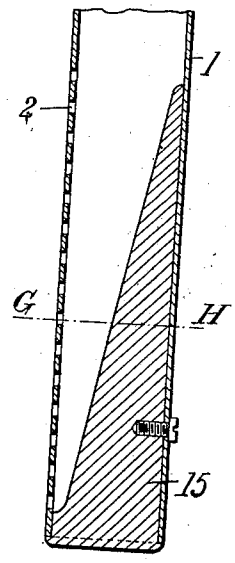


Fig. 4.

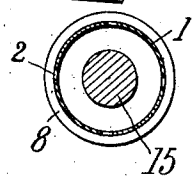


Fig. 7.

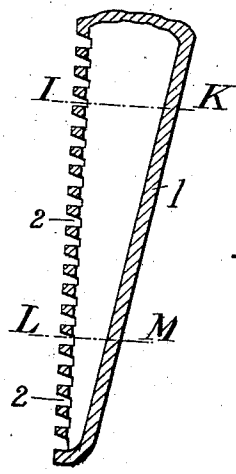


Fig. 6.

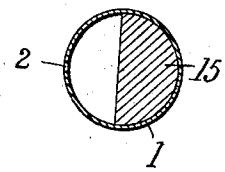


Fig. 8.

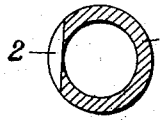
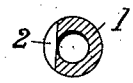


Fig. 9.



Witnesses.
Wm. C. Dashiell.
W. C. Healy

Inventor.
Nils S. Bök.
By James J. Healy
Atty.

UNITED STATES PATENT OFFICE

NILS SVENSSON BÖK, OF STOCKHOLM, SWEDEN.

DISTRIBUTING DEVICE FOR CENTRIFUGAL SEPARATOR-BOWLS.

No. 832,837. Specification of Letters Patent. Patented Oct. 9, 1906.

Application filed April 17, 1905. Serial No. 256,090.

To all whom it may concern:

Be it known that I, NILS SVENSSON BÖK, a subject of the King of Sweden, and a resident of Stockholm, Sweden, have invented new and useful Improvements in Distributing Devices for Centrifugal Separator-Bowls, of which the following is a specification, reference being had to the drawings accompanying and forming a part hereof.

This invention relates to improvements in distributing devices for centrifugal separator-bowls the interior of which by means of a liner is divided in several separating-spaces.

The object of the invention is to provide means by which the liquid to be introduced into the said separating-spaces will be distributed in such manner that each separating-space will receive a quantity of liquid corresponding to its separating capacity.

The invention consists, briefly, in the combination, with a centrifugal separating-bowl having a liner therein dividing the liquid-space of the bowl into several separating-spaces and a central orificed pipe, of an orificed non-rotating distributer in the said central pipe. The orifices of the said non-rotating distributer or the cross-sectional area of the latter should be decreasing in the direction of the flow of liquid in the distributer in order to obtain the desired distribution of the liquid in the orifices of the central pipe surrounding the distributer.

In the accompanying drawings I have shown several constructions embodying my invention.

Figure 1 shows in vertical section a centrifugal separating-bowl having a distributing device constructed in accordance with my present invention. Fig. 2 is a section on line A B in Fig. 1. Fig. 3 shows a central vertical section of another form of the non-rotating distributer. Fig. 4 is a cross-section on line E F in Fig. 3. Fig. 5 shows a third form of the non-rotating distributer, likewise in central vertical section. Fig. 6 is a cross-section on line G H in Fig. 5. Fig. 7 shows a central vertical section of a fourth form of the non-rotating distributer. Fig. 8 is a cross-section on line I K in Fig. 7, and Fig. 9 is a cross-section on line L M in Fig. 7.

Like reference-numbers indicate same or corresponding parts throughout all the figures.

Referring to Figs. 1 and 2, my distributing device is applied to a separator-bowl 5, having a liner of the well-known Alpha-Laval type, consisting of conical plates 14, superposed on one another. In the center of the bowl is inserted a hollow and at the lower end closed cylinder 1, having outlet-openings 2 and adapted to be detachably connected to the usual inlet-pipe extending from the reservoir containing the liquid to be separated, the said inlet-pipe and reservoir being not shown. The liquid to be separated is let into the distributing-cylinder 1 under a pressure sufficient to press out during a unit of time the predetermined total quantity of the liquid to be separated through the distributing-openings 2. The latter are in this case with respect to their positions and working cross-sections so chosen that like quantities of the liquid to be separated will in a unit of time be pressed out through the passages 2, that are placed on parts of the wall of the distributing-cylinder of the same axial lengths. The resistance against the outflow of the liquid necessary for the uniform distribution is thus located in the said short distributing-passages. By means of the arm 4, a part of which is shown in Fig. 1 and which is secured to the frame of the machine in any convenient manner, the distributing-channel is held in its central position in the bowl. The distributer thus does not partake in the rotation of the bowl.

By means of the distributing device just described it is possible to fulfil, with respect to the uniform distribution of the liquid in front of the inlet-openings 27 of the liner shown in Fig. 1, as an example, the conditions for a uniform feeding of the thin separating-spaces between the plates 14, the said spaces being supposed to be equivalent as to the separating capacity. This is due to the fact that the outflows on the sufficient small parts of the height of the distributer are quantitatively equal per unit of time, on account whereof no axial flow takes place in the narrow axial channels 28 of the wings 17 of the usual central pipe 10, nor any unlikenesses otherwise caused by such axial flow with respect to the heights of liquid columns working in front of the respective inlet-openings 27 between the edges of the plates 14, and inasmuch as the liquid pressed out radially through the distributing-passages 2 when striking the inner cylindrical wall of the central pipe 10 will along the whole inlet zone be brought into rotation in the same degree the distributed liquid will

in front of each inlet-opening 27 between the receiving edges of the plates have one and the same effective feeding-pressure height.

In order to obviate, while determining the cross-sections of the distributing-channels of a distributer, special adjusting steps with respect to the ununiformity of the outflow-pressure, which in the above-described distributer types occurs when the liquid to be separated during the axial flow in decreasing quantities per second, and thus at decreasing speed, passes the sections of a cylindrical distributer, which sections are of equal size, one may, as is shown in Figs. 3 and 4, provide a body 15 (made in one or more pieces) extending upward into the distributer 1 and being of such shape that the axial sections of the distributer will be decreasing in the direction of flow in such proportion that the radial outflow-pressure height working in each cross-section of the channel will be approximately constant. In Figs. 3 and 4 is shown a device of the said kind which distributes the liquid symmetrically in four directions. The body 15, extending into the distributing-cylinder 1, is of approximately conical shape and may be secured to the cylinder 1 in any convenient manner—for instance, by means of screw-threads, as shown at 8 in Fig. 3. Figs. 5 and 6 show a device of similar kind distributing the liquid in one direction only. The body 15 may here have approximately the shape of a diagonally-cut cylinder. For the same purpose the walls of the axial inlet-pipe may, as will be easily understood, be of such shape that the sections are decreasing in the direction of flow. Figs. 7, 8, and 9 show such a distributer. The distributing-passages 2 may be obtained by cross-grooves in the vertical wall of the distributer 1.

The liquid to be separated should preferably be freed from solid or other particles of such form and size that by the same any of the distributing-sections would be wholly or partly clogged up.

Having now particularly described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a centrifugal separating-bowl having a liner therein dividing the liquid-space of the bowl into several separating-spaces, and a central orificed pipe; of an orificed non-rotating distributer in the said central pipe.

2. In a centrifugal separator, the combination of a separating-bowl having a liner therein dividing the liquid-space of the bowl into several separating-spaces, a central orificed pipe, and an orificed non-rotating distributer in the latter having its cross-sectional area decreasing in the direction of flow, substantially as and for the purpose set forth.

3. In a centrifugal separator, the combination of a separating-bowl having a liner therein dividing the liquid-space of the bowl into several separating-spaces, a central orificed pipe, a non-rotating distributer in the latter, and a body arranged in the said distributer for decreasing the cross-sectional area of the latter in the direction of flow, for the purpose set forth.

4. In a centrifugal separator, the combination of a separating-bowl having a liner therein dividing the liquid-space of the bowl into several separating-spaces, a central orificed pipe, a non-rotating distributing-conduit in the latter, and a conical-shaped body arranged in and fixed with respect to the distributing-conduit, for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

NILS SVENSSON BÖK.

Witnesses:

GARDA LINDKVIST,
EVALD DELMAR.