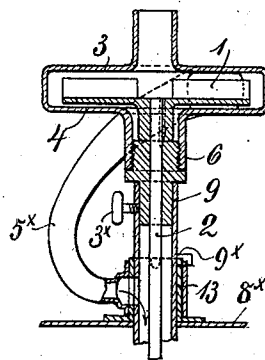
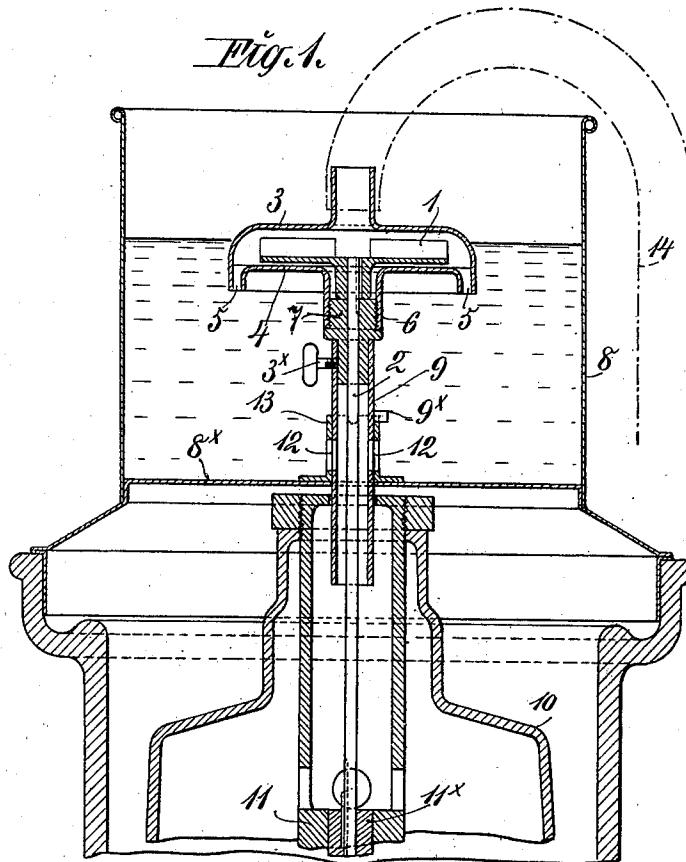


C. A. & O. W. HULT.
 MEANS FOR FEEDING LIQUID INTO CENTRIFUGAL LIQUID SEPARATORS.
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WITNESSES:

W. H. Benigan
F. H. Logan

INVENTORS.
 CARL ALRIK HULT and
 OSCAR WALFRID HULT,
 by *H. van Ouden*
 Attorney.

UNITED STATES PATENT OFFICE.

CARL ALRIK HULT AND OSCAR WALFRID HULT, OF STOCKHOLM, SWEDEN.

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Specification of Letters Patent. Patented June 27, 1911.

Application filed March 29, 1911. Serial No. 617,747.

To all whom it may concern:

Be it known that we, CARL ALRIK HULT and OSCAR WALFRID HULT, both subjects of the King of Sweden, and residents of Inedalsgatan 1, Stockholm, in the Kingdom of Sweden, have invented certain new and useful Improvements in Means for Feeding the Liquid into Centrifugal Liquid-Separators, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to means for feeding the liquid into centrifugal liquid separators in quantities proportional to the rotary velocity of the drum. The said means consists of a small centrifugal pump, which delivers the liquid to a vessel which is located above the centrifugal liquid separator, and from which the liquid then passes into the separating drum. When the pump is rotated at a higher speed, it keeps the liquid in the said vessel at a higher level and the liquid passes into the centrifugal drum more rapidly owing to the greater amount of pressure, and, vice versa, when the pump is rotated at a lower speed it keeps the liquid in the vessel at a lower level, so that the liquid passes into the drum more slowly owing to the lower pressure. In order that the said alteration of the level of the liquid may be effected exactly in proportion to the velocity of the drum, the shaft of the pump is connected directly to the drum. Owing to the comparatively great velocity of the drum and the great output of the pump resulting therefrom, the latter may be very small and located in or above the said vessel, so that the vessel receives the liquid directly from the pump. Owing to the said arrangements the whole device is very simple.

A modification of the device stated above consists in the vessel being dispensed with and the liquid led directly into the drum.

Figure 1 in the accompanying drawing shows the device in a vertical section. Fig. 2 shows the modification mentioned above. Only a part of the drum is shown.

The pump comprises the small wing wheel 1, its shaft 2 and the two side walls 3, 4 of the pump casing. Between the said side walls, which are connected in any suitable manner and of which the top wall incloses the bottom wall, a downward extending outlet opening 5 is provided. The pump casing is fixed to a collar 7 by means of a

central hollow stud 6, provided on its lower side. A pipe 9 forms an extension of the said piece 7 and is passed through the bottom of the vessel 8 and extends downward for some distance into the drum 10. The said piece 7 also serves as the bearing of the shaft 2 of the pump, which shaft is passed through the piece and extends with its lower end into a suitable recess, provided in the bottom of the center tube 11 of the drum or in the shaft 11^x of the drum extending into the said tube 11. The shaft 2 is connected with the tube 11 or with the shaft 11^x by means of a key or the like. The pipe 9 is guided by a sleeve 13, which is fixed to the bottom of the vessel 8 and incloses the pipe 9. The pipe 9 and the sleeve 13 are provided with side openings 12. By rotating the pump casing and the pipe 9 with relation to the sleeve 13 the said openings are opened to a greater or less extent or closed. Notches provided in the top edge of the sleeve and a pin 9^x fixed to the pipe hold the pipe in the adjusted position. The pump communicates with a tank containing the liquid through a hose 14 or the like.

When the centrifugal liquid apparatus is to be used, the openings 12 are first closed and the vessel filled with liquid to such a level, that the pump is also filled and the hose partially. As the centrifugal apparatus is then started the pump sucks at once liquid from the reservoir, so that the liquid level in the vessel 8 is raised. The exit openings 12 are now opened. Owing to the pressure in the vessel 8 the liquid passes into the centrifugal drum and the liquid level descends until a state of continuous operation is effected, *i. e.* the said level remains constant. If the velocity of the drum is increased, the action of the pump is also increased and the level of the liquid in the vessel is raised. Consequently, the liquid passes more rapidly into the drum, so that a greater quantity is fed into the same. If the said velocity is decreased the quantity of liquid fed into the drum is also decreased.

The pump is fixed to the pipe 9 by means of a thumb screw 3^x or the like. After the said screw has been untightened, the pump can be lifted up and removed from the vessel together with the shaft and the wing wheel of the pump. The connecting piece 7 also serves as a support to the wheel. The manner, in which the parts are connected, may, evidently, be modified. The pump may for

instance be connected directly with the top end of the pipe 9, while a piece 7 still is used.

The device may be modified in such manner, that the vessel 8 is dispensed with and the pump is provided with an outlet pipe 5* of the type used in ordinary centrifugal pumps, as shown in Fig. 2. The said pipe 5* incloses the sleeve 13, fixed to the cover 8* of the centrifugal apparatus. The pipe 5* can be rotated with relation to the sleeve 13, around the same, so that the openings leading to the centrifugal drum are opened to a greater or less extent or are closed in the same manner as stated above.

Having now described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a centrifugal liquid separator the combination of the rotatable separating drum and a centrifugal pump supplying the liquid to the drum and having its shaft directly connected with the said drum, substantially as described.

2. In a centrifugal liquid separator the combination of the rotatable, separating drum, a centrifugal pump which is located above the drum, co-axially to the same, and the shaft of which is connected with the said drum, so that it rotates at the same velocity as the drum, and means for conducting, to the drum, the liquid discharged from the pump.

3. In a centrifugal liquid separator the combination of the rotatable, separating drum, a centrifugal pump, which supplies the liquid to the drum and the casing of which is connected with the drum by means of a central pipe, the rotating wing wheel of the said pump, the shaft of the said wheel passed through the said pipe and connected with the drum, and means for conducting to said pipe the liquid discharged from the pump.

4. In a centrifugal liquid separator the combination of the rotatable separating

drum, a centrifugal pump, which supplies the liquid to the drum and the shaft of which is operatively connected with the drum, and means for conducting to the drum the liquid discharged from the pump.

5. In a centrifugal liquid separator the combination of the rotatable separating drum, a centrifugal pump which supplies the liquid to the drum and is connected directly with the same, and a vessel located above the drum, which receives the liquid from the pump and delivers the same to the drum through openings provided in the bottom of the vessel in quantities proportional to the pressure in the vessel controlled by the velocity of the pump, equal to the velocity of the drum.

6. In a centrifugal liquid separator the combination of the rotatable, separating drum, a centrifugal pump, which supplies the liquid to the drum and is connected with the same, and a vessel located above the drum and provided in its bottom with an outlet leading to the drum, which vessel receives the liquid from the pump, located in the vessel or above the same at a suitable level and co-axially to the drum.

7. In a centrifugal liquid separator the combination of the rotatable separating drum, a centrifugal pump connected with the drum and supplying the liquid to the same, and a vessel located above the drum and provided in its bottom with an outlet, in which vessel the pump is located, the said pump being provided with an outlet, extending around the periphery of the casing and located between the side walls of the same and leading to the said vessel.

In witness whereof, we have hereunto signed our names in the presence of two subscribing witnesses.

CARL ALRIK HULT.

OSCAR WALFRID HULT.

Witnesses:

AXEL EHRNER,

ROBERT APELGREN.