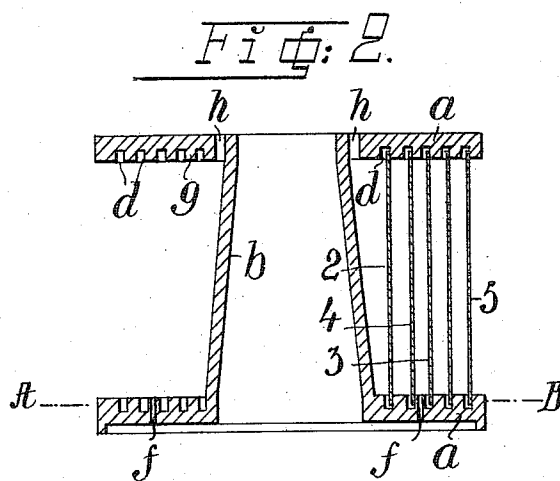
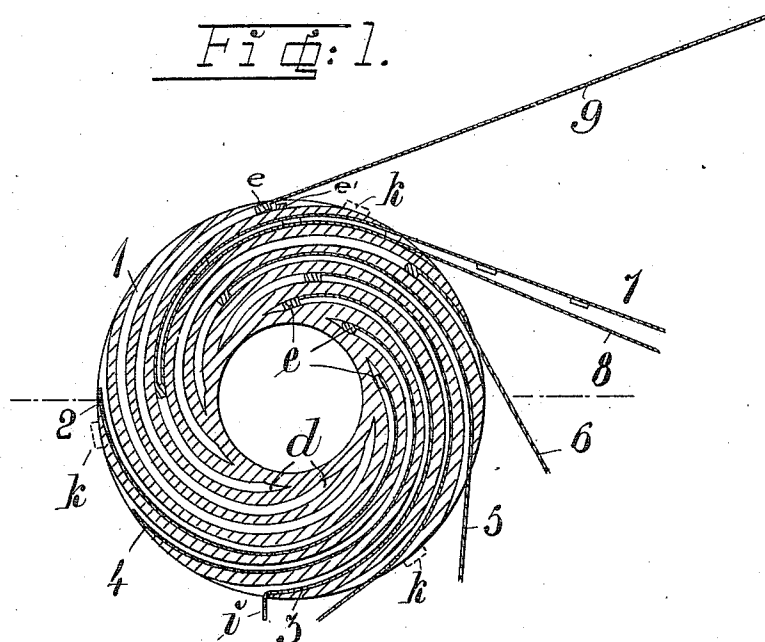


O. G. ÅBERG.
 LINER FOR CENTRIFUGAL DRUMS.
 APPLICATION FILED APR. 10, 1908.

985,876.

Patented Mar. 7, 1911.



Witnesses

Aug. Solander
Emil Wahlberg

Inventor

Oscar G. Åberg
 by *Brookman*
his Atty

UNITED STATES PATENT OFFICE.

OSCAR GOTTFRID ÅBERG, OF STOCKHOLM, SWEDEN, ASSIGNOR TO CARL ALRIK HULT,
OF STOCKHOLM, SWEDEN.

LINER FOR CENTRIFUGAL DRUMS.

985,876.

Specification of Letters Patent.

Patented Mar. 7, 1911.

Application filed April 10, 1908. Serial No. 426,213.

To all whom it may concern:

Be it known that I, OSCAR GOTTFRID ÅBERG, a subject of the King of Sweden, and resident of Stockholm, in the Kingdom of Sweden, have invented new and useful Improvements in Liners for Centrifugal Drums, of which the following is a specification, reference being had to the drawing accompanying and forming a part hereof.

This invention relates to improvements in liners for centrifugal drums, particularly such liners consisting of vertically or obliquely extending plates adapted to divide the liquid within the centrifugal drum into layers of a small thickness in radial direction. Hitherto, the several plates of such liners have usually been connected to each other by hinges, rings, or the like, so that they may be folded apart, after the liner has been removed from the drum, in substantially the same manner as the leaves of a book.

The object of the invention is to do away with the said connections between the plates and to make the said plates cheap in manufacturing, easily accessible for cleaning and equally distributed in the drum.

The invention consists, chiefly, in that the plates are loosely inserted, with their upper and lower edges, into grooves formed on or in the adjacent sides of two disks or other similar parts of a plate supporting frame. The plates may be initially bent in the shape of a spiral or, preferably, they may be plane and elastic in such a manner as to easily assume the form of the grooves, when inserted therein, and resume their plane form, when removed.

In the drawing, I have shown a liner embodying my invention.

Figure 1 is a horizontal section on line A—B of Fig. 2. Fig. 2 is a vertical central section of the liner.

Referring to the drawing, the plate supporting frame suitably comprises two round disks *a* which may be connected to, or made integral with, a central tube *b*, or which may be otherwise connected to each other at a distance apart corresponding to the height of the plates 2 to 9. In the disks *a*, at the sides thereof facing each other, are grooves *d* of a form corresponding to that to be assumed by the plates when in operative position, said grooves being, preferably, located oppo-

site or approximately opposite to each other, though they may, obviously, be placed at an angle to each other so as to cause the plates to take up a slanting or turned position between the disks *a*. The plates 2 to 9 are, preferably, so thin and of such a material as to be easily bent, whereby the plates, even if originally plane, may be easily caused to enter into and assume the form of the suitably curved grooves *d*. When the plates have been fully inserted into the grooves, which may extend up to the central tube *b*, the liner may be inserted into the drum, the plates being then secured in position by the inner wall of the drum. If the plates are not thick enough to entirely fill out the whole width of the grooves, each plate will be pressed, by the action of the centrifugal force, onto the outer side of the corresponding groove so that the plates will place themselves at equal distances from each other, during working. The plates should, preferably, be thin and elastic in order to be light and capable of assuming a substantially plane form, when removed for cleaning. Preferably, the plates should be made of hard-rolled sheet-aluminum so that they need not be placed in predetermined grooves, in order to balance the liner, but, obviously, the plates and grooves may be numbered, if desired, so that the plates may be inserted into predetermined grooves. If it is not desired to entirely detach the plates from the supporting frame, stops or abutments *e* may be provided at the inner ends of the plates in position to coöperate with similar stops or abutments *e'* at the outer ends of the grooves by which the plates are prevented from being entirely detached but may be pulled out to such a degree as to be accessible for cleaning, as shown by plate 9. If desired, the grooves may be wide enough to allow two or more plates to be introduced therein. In such case the said plates should be provided with studs or the like for keeping the plates apart from each other, as shown at the plates 7 and 8.

In the embodiment of the supporting frame shown in Fig. 2 the part connecting the two disks *a* has been constructed in the form of a central tube *b* adapted to serve as a distributor for the liquid. The liquid supplied to the said tube enters through openings *f* between the plates at suitable dis-

tances from the center. *g* are the ridges between the grooves *d*, and *h* are outlet openings for the separated lighter liquid.

Fig. 1 shows the curved grooves and the plates 2 to 9 inserted therein. 1 is an empty groove. 2, 3, and 4 are plates entirely inserted. 5 and 6 are plates partly inserted. 7 and 8 are two plates partly inserted into one and the same groove. 9 is a plate almost entirely retracted, but retained at the supporting frame by means of the stop *e*.

The plates may be folded or rounded at their inner edges in order to afford the least possible resistance during their insertion into the grooves. The outer edges of the plates may be bent so that, when the plates have been entirely inserted into their grooves, the bent parts *i* project outside the edges of the disks *a*. The projecting bent edges will bear on the inner side of the wall of the drum so that there will be a certain space (slime-chamber) between the liner and the drum. Such a space may also be formed by lugs *k* projecting from the disks *a* in which case the bent parts *i* of the plates may be dispensed with. When the plates are bent at their outer edges, as shown in the drawing, the bent parts *i* may be used as handles in inserting or retracting the plates. The disk of the supporting frame situated next to the outlet for the liquid must leave a space between its outer edge and the inner side of the wall of the drum so as to allow the liquid to run off, for which purpose the said disk may be made somewhat smaller in diameter than the drum.

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

1. In a liner for a centrifugal drum the combination of a frame adapted to be inserted into the drum, and liner plates loosely inserted in the said frame in such a manner as to be capable of sliding horizontally and bodily outwardly and inwardly in the said frame.

2. In a liner for a centrifugal drum the combination, of a frame having grooves in the upper and lower parts thereof, and liner plates slidably inserted in the said grooves in such a manner as to be capable of sliding horizontally outwardly and inwardly in the said grooves, when the liner is removed from the drum.

3. In a liner for a centrifugal drum the combination, of a frame having horizontally curved grooves in the upper and lower parts

thereof, and liner plates slidably inserted in the said grooves in such a manner as to be capable of sliding horizontally outwardly and inwardly in the said grooves, when the liner is removed from the drum.

4. In a liner for a centrifugal drum the combination, of a frame, and flexible elastic liner plates loosely inserted in the said frame in such a manner as to be capable of sliding horizontally and bodily outwardly and inwardly in the said frame.

5. In a liner for a centrifugal drum the combination, of a central inlet tube having disks at its upper and lower ends, said disks having grooves in the sides thereof facing each other, and liner plates slidably inserted in the said grooves in such a manner as to be capable of sliding horizontally outwardly and inwardly in the said grooves, when the liner is removed from the drum.

6. In a liner for a centrifugal drum the combination, of a frame having grooves in the upper and lower parts thereof, liner plates slidably inserted in the said grooves in such a manner as to be capable of movement outwardly and inwardly, when the liner is removed from the drum, and means for preventing the plates from being wholly removed from the said grooves.

7. In a liner for a centrifugal drum the combination, of a frame having grooves in the upper and lower parts thereof, liner plates slidably inserted in the said grooves in such a manner as to be capable of movement outwardly and inwardly, when the liner is removed from the drum, and means for keeping plates inserted into one and the same grooves at a desired distance from each other.

8. In a liner for a centrifugal drum the combination, of a frame, and liner plates slidably inserted in the said frame in such a manner as to be capable of movement outwardly and inwardly, when the liner is removed from the drum, said plates being bent at their outer edges so as to form handles bearing, when the liner is inserted into the drum, on the inner side of the wall thereof.

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

OSCAR GOTTFRID ÅBERG.

Witnesses:

AUG. SÖRENSEN,
EMIL WAHLBERG.