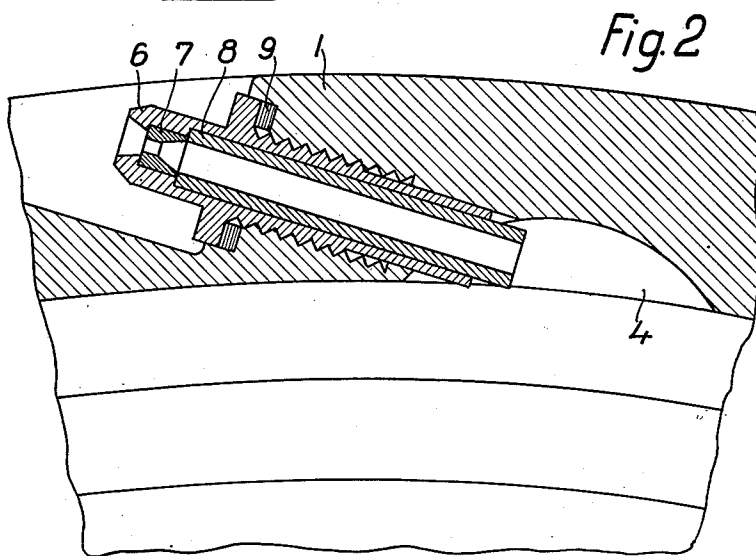
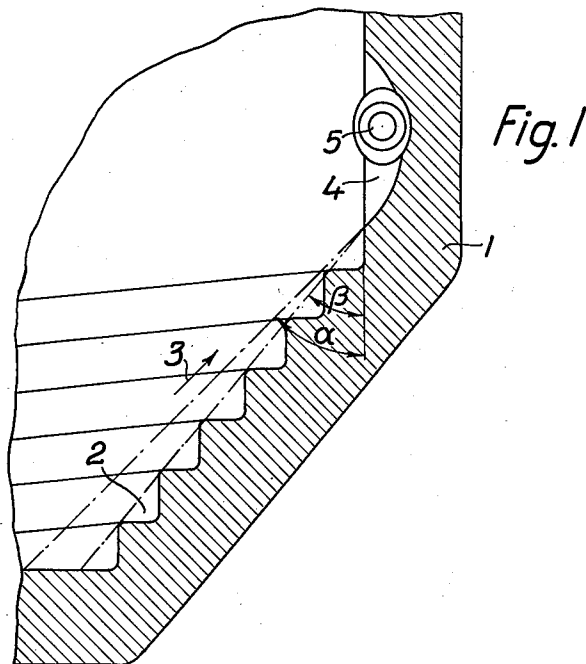


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CENTRIFUGAL BOWL FOR SEPARATING
SLUDGE FROM LIQUIDS
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CENTRIFUGAL BOWL FOR SEPARATING
SLUDGE FROM LIQUIDS

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2 Claims. (Cl. 233—47)

1

This invention relates to centrifugal separators for separating sludge from liquids, and more particularly to an improved centrifugal bowl for this purpose.

In centrifugal bowls for separating sludge-containing liquids, the separated sludge passes through channels in the bowl or slides along the bowl wall in order to reach the sludge outlet or outlets. Such bowls are usually exposed to considerable wear because of the wearing or grinding effect of the sludge as it slides along the inner surface of the bowl wall. This wear can be kept within reasonable limits by employing special measures, as by applying to the surfaces exposed to wear a coating of some protecting material, such as rubber or a similar substance. However, constructions of this type are generally very expensive.

The present invention has for its principal object the provision of a centrifugal bowl for separation of liquids containing sludge, in which the wear due to sliding of the separated sludge along the inner surface of the bowl wall in passing to the sludge outlet is greatly reduced or eliminated, without the necessity of providing a special protective lining, or the like, for such surface.

A centrifugal bowl made according to the invention has a sludge outlet in the bowl wall and also has an inner surface of the wall leading toward the outlet and along which the separated sludge moves in its travel to the outlet. The bowl is characterized by a series of closely adjacent pockets formed in this inner surface which extend transversely to the direction of the sludge movement to the outlet and are arranged to receive separated sludge and retain it during the separating operation, so that the pockets are kept filled with sludge during the separation and thereby prevent wear of the underlying parts of the bowl surface. In the preferred construction, the sludge-retaining pockets are formed by adjacent annular grooves in the inner surface of the bowl wall, which are concentric with the rotation axis of the bowl, so that the separated sludge passing to a plurality of circumferentially spaced sludge outlets in the bowl (or a single circumferentially extending outlet) will pass along the bowl surface but out of contact therewith by reason of the intervening stationary sludge retained by the grooves. Also, the grooves are preferably arranged in steps having an inclination less than the angle or repose of separated sludge in the bowl during the centrifuging, whereby the grooved wall remains entirely covered with a stationary sludge layer.

2

For a better understanding of the invention, reference may be had to the accompanying drawing, in which:

Fig. 1 is a vertical sectional view of part of a preferred form of the new centrifugal bowl, and Fig. 2 is an enlarged horizontal sectional view of the bowl part illustrated in Fig. 1.

Referring to the drawing, the wall 1 of the centrifugal bowl is provided internally with a series of annular grooves 2 concentric with the rotation axis of the bowl and formed, for example, by turning operations. The grooves 2 form sludge-retaining pockets in an internal surface of the bowl leading toward sludge outlets in the bowl periphery and along which surface the separated sludge moves outward, in the direction indicated by arrow 3, in its travel to the sludge outlets, one of which is shown at 5. As illustrated, the grooves are arranged in step form, and they serve to catch and retain separated sludge so that the grooves are kept filled with sludge by the action of centrifugal force during the centrifuging, the retained sludge thus forming a protective coating on the bowl wall. The inclination of the flight of steps formed by grooves 2 should be such that the angle B in Fig. 1 is less than the angle of repose of the sludge, designated α in Fig. 1, so that the grooved wall will, during separation, remain entirely covered with sludge layer, across which the separated sludge slides in the direction of the arrow 3 toward the sludge outlets 5 situated in recesses 4 in the bowl wall. It will be understood that the grooves 2 need not be arranged stepwise along a straight line. The number as well as the depth and width of the grooves may also vary according to circumstances.

Each sludge outlet 5 is provided with a tangentially directed nozzle, consisting of an outer sleeve 6 screwed into the bowl wall 1, a perforated disc or nozzle insert 7, and a tube 8. Between the sleeve 6 and the bowl wall 1 is a packing 9. The tube 8, which should be made of a wear-resistant material, for example, glass, and should be easily replaceable, ends in the recess 4 where it extends freely in a direction toward the interior of the bowl. During separation, a deposit of sludge is formed in the recess 4 which protects the material of the wall 1, and to some extent the inner end of sleeve 6, against wear. The channel in the sleeve 6 is protected from wear by the two linings 7 and 8.

I claim:

1. In a centrifugal bowl for separating sludge from a liquid, especially sludge having a strong

wearing effect, the bowl having a sludge outlet in the bowl wall and also having an inner surface of said wall slanting outward from the bowl axis toward said outlet and along which the separated sludge moves outward in its travel to the outlet, the improvement which comprises a series of annular grooves in said inner surface, each groove forming a pocket extending around the bowl axis transversely to the direction of the sludge movement to said outlet, the grooves being arranged in step form and the steps forming a flight having an inclination to the vertical less than the angle of repose of the separated sludge in the bowl.

2. The improvement according to claim 1, in which the bowl wall is formed with an internal recess adjacent said outlet, the outlet comprising a nozzle in the bowl wall and a lining of wear-resistant material in the nozzle, the inner end

of the lining terminating in said recess and projecting freely toward the interior of the bowl.

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