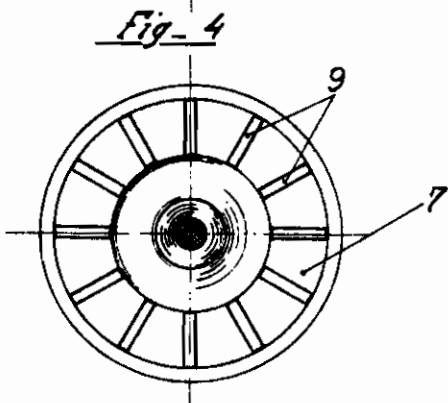
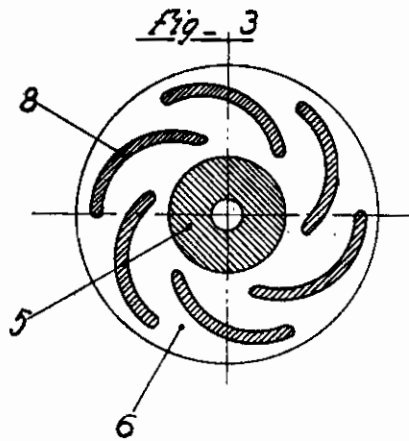
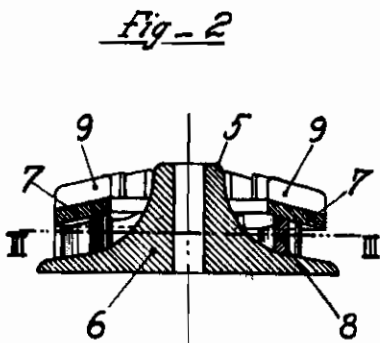
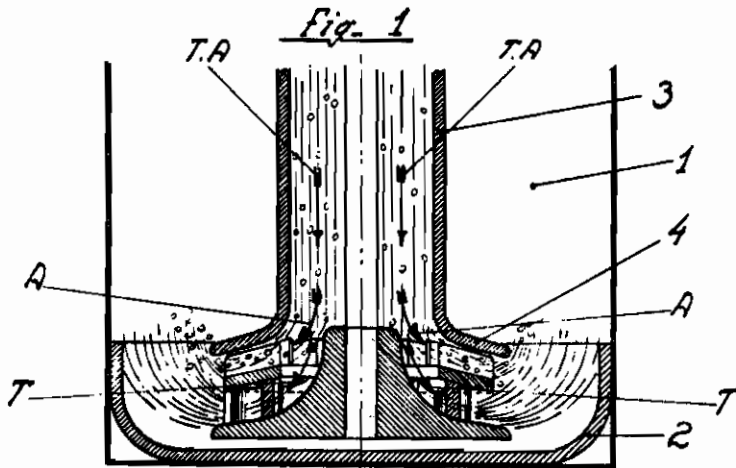


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FLOTATION-APPARATUS OF THE  
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# ALIEN PROPERTY CUSTODIAN

## FLOTATION-APPARATUS OF THE MECHANICALLY AGITATED TYPE

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This invention relates only to flotation-apparatus of the mechanically agitated type where air is sucked in from above without additional aeration under pressure from below, and the object of this invention is a combination-impeller built in such a way that the emulsification in the ore-pulp of the sucked-in air on the one hand and the transporting of the pulp on the other hand are effectuated separately from each other by the two parts of the combination-impeller with a maximum of efficiency and of economy.

Combination-impellers based on similar principles are already known in flotation-apparatus of the sub-aeration type and they consist of a horizontal disc of solid cross-section attached to the impeller shaft which bears on its underside the blades for the distribution of the air blown in, whilst its upper-side is provided with the blades for the transporting of the pulp.

This known type of combination-impeller is characterized by the important feature, that in its upper- and underside are completely separated from each other by the mentioned disc of solid cross-section and the action of this combination-impeller is thus limited to the rough distribution of the air blown-in thus impeding the surging-up of this air in a voluminous mass through the pulp to its surface, causing thus ebullition of the pulp-surface with consequential trouble in the froth-formation. Obviously this lower part of this known combination-impeller cannot beat the blown-in air into the pulp, because this part of the combination-impeller is not accessible to the pulp-current set up by the upper part of said impeller.

The present invention differs from this known combination-impeller both in design and action as set out in the following lines.

In contrast with the known combination-impeller the present invention relates to a combination-impeller where the blades effectuating the distribution and the emulsifying of the sucked-in air are placed above those serving for the transporting of the pulp, and where those upper blades are separated from the lower blades not by a disc of solid cross-section but by one of annular cross-section.

Consequently, in the combination-impeller being object of the present invention, the upper part of the impeller is fully accessible to the pulp current set up by the lower part and the upper part is thus enabled to perform its function which is the emulsifying in the pulp of the sucked-in air.

The following description accompanied by the

drawing Fig. 1 to Fig. 4 serves to illustrate both design and function of the said combination-impeller.

Fig. 1 is a diagrammatic vertical section through a part of a flotation apparatus which shows the position of the combination-impeller and its action.

Fig. 2 is a longitudinal section of the combination-impeller.

Fig. 3 is a cross-section through it along III—III of Fig. 2.

Fig. 4 is the top-view of the combination-impeller according to Fig. 2.

Fig. 1 contains in diagrammatic form those constructional elements which are common features of all types of mechanically agitated flotation-apparatus where air is sucked-in from above i. e. in the flotation cell 1 a stationary bottom part 2 and another also stationary part 3 in the shape of a hollow cylinder which bears on its lower edge a bell-shaped or flat-shaped outward flaring rim 4. In the space between those two elements 2 and 3 the combination-impeller is placed (Figs. 2, 3 and 4). This combination-impeller consists of a hub 5 and two discs 6 and 7 of which the lower disc 6 is of a solid cross-section, whilst the upper disc 7 is of annular cross-section.

Between the annular disc 7 and the solid disc 6 a series of blades 8 are placed which are shaped and arranged like the blades of a centrifugal pump. The annular disc 7 bears on its upper side a series of radial blades 9 of such a height that their upper edges nearly touch the flaring rim 4.

This combination-impeller acts as follows:

In all types of mechanically agitated flotation-apparatus where air is sucked-in from above, there passes a pulp-stream downwards through the hollow cylinder 3 of Fig. 1 which along its downward passage TA Fig. 1 dissolves and entrains a considerable quantity of air. When hitting upon the bottom disc 6 of the combination-impeller, this pulp stream gets checked and builds-up a moment before it gets drawn into the bottom part of the combination-impeller, and during this building-up period the air contained in the pulp rises to the top of the built-up pulp and together with the latter gets quickly drawn in by the upper part of the combination-impeller where the radial blades effectuate the emulsifying of this air in the pulp which after passing this upper part joins immediately the upward current of the pulp created by the lower part of the combination-impeller. This combination-

impeller has the following advantages over the simple impellers used hitherto:

1. The lower part of this combination-impeller can be designed exactly like the impeller of a centrifugal pump because its task is only the transportation of the pulp and not the emulsifying in the pulp of the sucked-in air; in this way the pumping efficiency of the combination-impeller is considerably increased and thus the circulation of the pulp and with it the flotation process is considerably accelerated.

2. The upper part of this combination-impeller

can be designed to best suit its task which is only the emulsifying of the sucked-in air in the pulp without having to take regard to the transportation of the pulp which is effectuated by the lower part of the combination-impeller.

It has been found advantageous to use straight blades in the upper part of the combination-impeller and to arrange them radially on the annular disc; shape and arrangement of those blades can be, however, also different from those given above as an example.

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