Title (en)

Column flotation device

Title (de)

Säulen-Flotationsvorrichtung

Title (fr)

Dispositif de flotation à colonne

Publication

EP 1193342 A1 20020403 (DE)

Application

EP 00121044 A 20000927

Priority

EP 00121044 A 20000927

Abstract (en)

The flotation system (10a), to separate a suspension into fractions which are rich and poor has a suspension inflow (22) into the separation tank column (28) which gives a central and vertical main flow (30). Blades (32) are arranged radially outside the main flow. To give a fraction with a low matter content, a flow is directed outwards and at a downwards angle to a collection zone (18), into a ring collection channel (34) for the fraction which has a low material content. The separation tank has a circular or polygonal cross section. Or it has a general funnel shape, with an upwards expanding cross section. A further assembly of blades, stacked over each other, forms a cascade structure radially outside the collection channel. The collection channel is between the downstream edges of the initial blades and the upstream edges of the second set of blades. Inflow openings are at the lower end of the collection channel, for the introduction of chemicals and/or bubble fluid mixtures. A filtration zone (40) is radially outside the collection channel, to hold filtration particles of active carbon. The system has a filtrate outlet and a filter material outlet, where the filtration particles move in a counter flow to the filtrate flow in the filtration zone to the regeneration unit (44) at the opposite end, and are recirculated as regenerated particles. A number of blade flotation units and/or filtration units are assembled in an array outwards and in succession. Separate outlets are between them, to take off different fractions. Two or three blade flotation units are deployed as shells, radially outwards, with two or three filtration units outside a flotation unit. The blades have the shape of a closed conical ring, at a pitch angle of 10-40 degrees to the horizontal, and preferably 20-30 degrees . In the direction of the flow of the low-content fraction, the blades have a length which is 1-4 times the width of the main flow channel defined by the inner edges of the blades. The gap between the blades increases upwards from below. At least part of the blades is corrugated. At least part of the blades is a multilayer honeycomb structure, with two outer layers and linking structures between them, preferably forming passage flow channels between the outer layers. At least part of the blades is a micro-porous membrane, and at least a part of the blades forms a curvature. The suspension inflow has a channel for the incoming suspension into the flotation assembly, with a radial outlet system to give an outflow in a radial direction, covered by a central passage preferably covered by a conical dome, so that the suspension flows centrally into the flotation tank. The radial unit has a horizontal beating plate (26), to deflect the suspension flow radially, The radial unit has a number of radial outflows (24) in a discrete array round the circumference. A take-off unit (16) for the fraction with a high content of matter is over the separation tank, with a passage aligned with the main flow. It has at least one impeller system to pass the rich fraction through a reject outlet, using a rotating conveyor screw or spatial paddles (56) in a horizontal channel (52). The flotation action is non-selective, using a pressure relief flotation with a bubble flow at the suspension inlet. Or the flotation is selective, with a feed of chemical additives at the suspension flow inlet.

Abstract (de)

Eine turmartige Flotationsvorrichtung (10a) zur Trennung von Stoffen oder Stoffgemischen aus Suspensionen zur Bildung mindestens einer stoffreichen und stoffarmen Fraktion mit einem säulenartigen Separationstank, der unten einen Suspensionseinlaß (22) sowie mehrere übereindander angeordnete schräg angeordnete Lamellen (32), einen ersten Ausgang (36) für die stoffarme Fraktion sowie einen im oberen Bereich angeordneten zweiten Ausgang (16) für die stoffreiche Fraktion umfaßt, ist dadurch gekennzeichnet, daß der Suspensionseinlaß (22) eine mittige, vertikal gerichtete Hauptströmung bewirkt, wobei die Lamellen (32) radial außerhalb der Hauptströmung angeordnet sind und für die stoffarme Fraktion eine nach außen und schräg unten gerichtete Strömung bewirken, und radial außerhalb der Lamellen ein ringartiger Sammelkanal (18) für die stoffarme Fraktion gebildet ist. Dies hat den Vorteil, daß durch die Anordnung der Vertikalströmung nach radial oben und die Anordnung der Lamellen radial außerhalb der Hauptströmung die Strömung der stoffarmen Fraktion nach radial außen gerichtet ist und sich damit zunehmend verlangsamt, was eine bessere Abtrennung der Partikel bewirkt. <IMAGE>

IPC 1-7

D21F 1/70; B03D 1/24

IPC 8 full level

B03D 1/24 (2006.01); **D21F 1/70** (2006.01)

CPC (source: EP)

B03D 1/1412 (2013.01); **B03D 1/1431** (2013.01); **B03D 1/1475** (2013.01); **B03D 1/1481** (2013.01); **B03D 1/24** (2013.01); **D21F 1/70** (2013.01); B03D 1/1462 (2013.01)

Citation (search report)

- [A] US 5897772 A 19990427 - CHIANG SHIAO-HUNG [US], et al
- [A] US 5080780 A 19920114 - CANZONERI ANTHONY S [US], et al
- [A] DE 1300082 B 19690731 - SARANIN ALEXANDER PETER
- [A] WO 9217260 A1 19921015 - BAGGALEY JACK [GB]
- [A] US 5294003 A 19940315 - HOLLINGSWORTH CLINTON A [US]
- [E] DE 19915735 A1 20001019 - MERI ENTSORGUNGSTECH PAPIERIND [DE]

Cited by

DE102007020029A1; CN105537239A; AT509908A3; AT509908B1; CN112320916A; WO2008028650A1; WO2005099857A1; US7485223B2; US8540884B2; EP3308844B1

Designated contracting state (EPC)

AT BE CH CY DK ES FI FR GB GR IE IT LI LU MC NL PT SE

DOCDB simple family (publication)

EP 1193342 A1 20020403; **EP 1193342 B1 20040107**; AT E257529 T1 20040115; ES 2214203 T3 20040916

DOCDB simple family (application)

EP 00121044 A 20000927; AT 00121044 T 20000927; ES 00121044 T 20000927