

Title (en)
High-intensity magnetic separator

Title (de)
Magnetische Abscheider mit hoher Intensität

Title (fr)
Séparateur magnétique à haute intensité

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Application
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Abstract (en)
Downstream of the means of friction and upstream of the means of supply with respect to a first direction (4), there are means (28) of continuously discharging the resulting ferromagnetic particles, staying on the external peripheral face. The separator has a frame (3); a rotor (1) with a first axis (2) fixed with respect to the frame and approximately horizontal, and an external peripheral face (10) which is cylindrical about the first axis and made of alternating annular polar pieces (7) and annular permanent magnets (6) of revolution with axial magnetism alternating in opposite directions. There are means of supply (15) to deposit continuously directly onto an upper zone (16) of the peripheral external face a particulate product (11) which can contain in mixture comparatively fine paramagnetic particles (12), non magnetic particles (13) and ferromagnetic particles (14). There are also means of cutting (22) placed downstream of the means of supply with respect to the first direction (4), near the external peripheral face, to separate continuously the resulting non magnetic particles falling from the external peripheral face by gravity, the resulting paramagnetic particles and the resulting ferromagnetic particles which stay on the external peripheral face by magnetic attraction. Means of friction (21) are placed downstream of the means of cutting in contact with the external peripheral face to continuously detach the paramagnetic particles from it. The external peripheral face (30) of a cylindrical roller (29) about a second axis (31) made of magnetic material and cut in a pattern of grooves (38) has axial dimensions matching those of the external peripheral face of the rotor. Means of positioning the second axis parallel to the first allow the face of the roller to be placed locally in immediate proximity to the face of the rotor so the grooves form zones of high gradient magnetic field attracting the resulting ferromagnetic particles. The roller is driven in continuous rotation in a second direction (35) about the second axis and there are means of continuously detaching the ferromagnetic particles attracted by the grooves downstream of the position of immediate proximity in the second direction. The means of continuously discharging also include means of scraping the external surface of the rotor continuously with the same axial dimensions as the rotor and near the position of immediate proximity (36). The scraper has a blade (52) of paramagnetic material placed immediately downstream of the position immediate proximity in the first direction and positioned tangentially to the external face of the rotor. The blade has a rectilinear stop (53) turning upstream and with, parallel to the first axis, dimensions matching the axial dimensions of the external face of the rotor. The blade is supported by the frame so the rectilinear stop is held against the external face of the rotor by magnetic attraction of the blade to the polar pieces and permanent magnets of the rotor.

Abstract (fr)
La présente invention concerne un séparateur magnétique à haute intensité comportant un rotor magnétique (1) entraîné en rotation continue autour d'un axe approximativement horizontal (2). Un produit particulaire (11) susceptible de contenir, en mélange, des particules paramagnétiques (12), des particules non magnétiques (13) et de fines particules ferromagnétiques (14) est déposé sur une zone supérieure (16) d'une face périphérique extérieure (10) du rotor (1), dont la rotation s'accompagne successivement d'une chute des particules non magnétiques (13) et d'un détachement, par friction, des particules paramagnétiques (12). Pour éviter un encrassement de la face périphérique extérieure (10) du rotor par les fines particules ferromagnétiques (14), qui réduiraient son aptitude à retenir les particules paramagnétiques jusqu'à ce qu'elles en soient détachées par friction, en aval des moyens de friction (21) sont prévus des moyens (28) de déchargement continu des fines particules ferromagnétiques éventuelles (14), restées sur la face périphérique extérieure (10) du rotor (1). <IMAGE>

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