NEW INVENTIONS

MAGNETIC SEPARATION FOR SILICON-CONTAINING MATERIALS

Inventors: J.A. Brinson, J.E. Herman, D.W. Snodgrass and H. Hosokawa
Applicant: Dow Corning Corporation
Patent number: US 6,433,205
Date of patent: August 13, 2002

Magnetic separators are used for treating silicon-containing materials from chlorosilane reactors to remove magnetically influenced components. The removal of such impurities allows for enhanced reactivity of the silicon-containing materials in processes wherein the silicon-containing materials are raw materials for the production of silicon-based compounds.

DENSE MEDIUM CYCLONE SEPARATOR

Inventor: J.B. Bosman
Applicant: Multotech Process Equipment Ltd.
Patent number: US 6,530,484
Date of patent: March 11, 2003

The invention provides a cyclone adapted for use in a dense medium separation process comprising an inlet chamber having a tangential raw material feed inlet, a vortex finder extending into the inlet chamber, and defining a low gravity fraction outlet for a low gravity fraction of separated material, a conical section opposed to the vortex finder extending and converging in a direction away from the inlet chamber, an outlet chamber extending co-axially with the conical section and in the direction opposed to the inlet chamber and providing an unobstructed flow path to a high gravity fraction outlet for a high gravity fraction of separated material being disposed generally tangentially relative to the outlet chamber.

CYCLONIC SEPARATOR WITH ELECTRICAL OR MAGNETIC SEPARATION ENHANCEMENT

Inventors: Th. Couture and N. Arrison
Patent number: US 6,355,178
Date of patent: March 12, 2002

A cyclone or hydrocyclone for separating fluids and particles includes an electrostatic charge generator, a direct current power source, a magnet or an electromagnet for
augmenting the centrifugal separation forces generated by the cyclone or hydrocyclone. The cyclone also includes a physical vibration generator or a sonic wave generator or both.

**MAGNETIC PROCESS FOR REMOVING HEAVY METALS FROM WATER EMPLOYING MAGNETITES**

Applicant: The Regents of the University of California
Patent number: US 6,596,182
Date of patent: July 22, 2003

A process for removing heavy metals from water is provided. The process includes the steps of introducing magnetite to a quantity of water containing heavy metal. The magnetite is mixed with the water such that at least a portion of the heavy metal in the water is bound to the magnetite. Once this occurs the magnetite and adsorbed metal is removed from the water by the application of the magnetic field.

**HYDROCYCLONE AND PROCESS FOR REMOVING FOREIGN SUBSTANCES FROM A LIQUID**

Inventor: R. Hartmann
Applicant: Voith Sulzer Papiertechnik Patent GmbH
Patent number: US 6,398,969
Date of patent: June 4, 2002

The hydrocyclone includes at least one inlet for the liquid to be cleaned, at least one accepted stock outlet for the cleaned liquid, and at least one reject opening for foreign substances removed from the liquid to be cleaned. At least one reject opening includes at least one stoppage-hazard zone, and a colour layer is coupled to an exterior wall of the hydrocyclone. The colour layer changes appearance in accordance with different temperatures. The process includes introducing the liquid to be cleaned into a hydrocyclone, discharging cleaned liquid and discharging the foreign substances.

**HYDROCYCLONE DEVICE FOR CLEANING A FLUID**

Inventors: M. Danger, R. Hartmann, S. Rippl and P Schweiss
Applicant: Voith Paper Patent GmbH
Patent number: US 6,508,366
Date of patent: January 21, 2003

Hydrocyclone device including a hydrocyclone having a feeding connector, an accepted stock connector, and a rejected stock connector. The device also includes a distribution and collection device arranged for feeding fluids into and removing fluids from a hydrocyclone, and a flange coupled to a feeding connector, a accepted stock connector
and a rejected stock connector, which is removably coupled to a distribution and collection device.

TWO-STAGE HYDROCYCLONE SYSTEM

Inventors: K. Hashmi, H. A. Hamza and K. Lal Kar
Applicant: Natural Resources Canada
Patent number: US 6,582,600
Date of patent: June 24, 2003

A two-stage hydrocyclone system for separating oily fluids including a first stage hydrocyclone set up to produce a concentrated oil stream, while the second stage hydrocyclone is set up to optimize the production of clean water from, dirty water underflow stream of the first stage. The hydrocyclone stages are mounted within a pressure vessel with walls, with the first stage producing a concentrated oil stream substantially free of water and dirty water stream containing some oil. This dirty water stream from the first stage is fed to the second stage to obtain a clean water stream.

METHOD AND DEVICE FOR RECOVERING PURE PVC FROM PLASTIC WASTE CONTAINING PVC

Inventors: P. Muller, A. Baron von Heyking and J. Leitzke
Applicant: P-TEC GmbH Polymertechnologie
Patent number: US 6,548,561
Date of patent: April 15, 2003

In a method for recovering pure PVC from pre-disintegrated PVC-containing substance mixtures, the mixture is soaked in a swelling agent for PVC, is supplied under pressure into an arrangement of at least two sequential hydrocyclones, wherein, in the first hydrocyclone, a heavy fraction of impurities is separated in the sink flow and a light fraction of swelled PVC particles and light impurities and plastic particles are separated in the rising flow, wherein the pre-cleaned light fraction is sorted and the particle fraction comprising the swelled PVC particles and similar plastic particles is fed to the second hydrocyclone in which the PVC particles are separated in the sink flow.

HYDROCYCLONE SEPARATOR

Inventors: S. Gil and J. Belogorodsky
Applicant: Odis Irrigatcon Equipment Ltd.
Patent number: US 6,540,918
Date of patent: April 1, 2003

A hydrocyclone separator comprising a truncated cone-shaped vessel having a tangential fluid stream inlet, a fluid stream outlet, a solid particle collector and a conical insert removably mounted between the truncated cone-shaped vessel and the solid particle collector, said conical insert comprising an erosion resistant material.
A method and apparatus for magnetic separation of particles within a container is described. In one embodiment, a plurality of magnets are arranged in a first row and in a second row on a frame, wherein the plurality of magnets are oriented in a plane coplanar with a horizontal cross-sectional plane of the frame. The frame has housing means between the first row and the second row for housing containers. The plurality of magnets apply north-south magnetic field oriented coplanar with the horizontal cross-sectional plane of the frame. The north-south magnetic field direction of the first magnet in the first row alternates 180 degrees from the north-south magnetic field direction of the second magnet in the first row, and the north-south magnetic field direction of the first magnet in the second row opposes the north-south magnetic field direction of the first magnet in the first row.