

CPC**COOPERATIVE PATENT CLASSIFICATION****B03C****MAGNETIC OR ELECTROSTATIC SEPARATION OF SOLID MATERIALS FROM SOLID MATERIALS OR FLUIDS; SEPARATION BY HIGH-VOLTAGE ELECTRIC FIELDS** (filters

making use of electricity or magnetism [B01D 35/06](#); separating isotopes [B01D 59/00](#); combinations of magnetic or electrostatic separation with separation of solids by other means [B03B](#), [B07B](#); separating sheets from piles [B65H 3/00](#); magnets or magnet coils per se [H01F](#))

B03C 1/00**Magnetic separation**[B03C 1/002](#)

. {High gradient magnetic separation}

[B03C 1/005](#)

. Pretreatment specially adapted for magnetic separation

[B03C 1/01](#)

. . by addition of magnetic adjuvants

[B03C 1/015](#)

. . by chemical treatment imparting magnetic properties to the material to be separated, e.g. roasting, reduction, oxidation

[B03C 1/02](#)

. acting directly on the substance being separated

[B03C 1/021](#)

. . Separation using Meissner effect, i.e. deflection of superconductive particles in a magnetic field

[B03C 1/023](#)

. . Separation using Lorentz force, i.e. deflection of electrically charged particles in a magnetic field

[B03C 1/025](#)

. . High gradient magnetic separators

[B03C 1/027](#)

. . . with reciprocating canisters

[B03C 1/029](#). . . with circulating matrix or matrix elements (matrix elements [B03C 1/034](#))[B03C 1/03](#)

. . . . rotating, e.g. of the carousel type

[B03C 1/031](#)

. . . . Component parts; Auxiliary operations

[B03C 1/032](#)

. . . . Matrix cleaning systems

[B03C 1/033](#)

. . . . characterised by the magnetic circuit

[B03C 1/0332](#)

. {using permanent magnets}

[B03C 1/0335](#)

. {using coils}

[B03C 1/0337](#)

. {superconductive}

[B03C 1/034](#)

. characterised by the matrix elements

[B03C 1/035](#)

. . Open gradient magnetic separators, i.e. separators in which the gap is unobstructed, characterised by the configuration of the gap

[B03C 1/0355](#)

. . . using superconductive coils

[B03C 1/04](#)

. . with the material carriers in the form of trays or with tables

[B03C 1/06](#)

. . . with magnets moving during operation

[B03C 1/08](#)

. . . with non-movable magnets

[B03C 1/10](#). . with cylindrical material carriers ([B03C 1/247](#) takes precedence)[B03C 1/12](#)

. . . with magnets moving during operation; with movable pole pieces

[B03C 1/14](#)

. . . with non-movable magnets

[B03C 1/145](#)

. . . . {with rotating annular or disc-shaped material carriers}

- B03C 1/16 . . with material carriers in the form of belts
- B03C 1/18 . . . with magnets moving during operation
- B03C 1/20 in the form of belts, e.g. cross-belt type
- B03C 1/22 . . . with non-movable magnets
- B03C 1/23 . . with material carried by oscillating fields; with material carried by travelling fields, e.g. generated by stationary magnetic coils; Eddy-current separators, e.g. sliding ramp
- B03C 1/24 . . . with material carried by travelling fields
- B03C 1/247 obtained by a rotating magnetic drum
- B03C 1/253 obtained by a linear motor
- B03C 1/26 . . with free falling material ([B03C 1/035](#) takes precedence)
- B03C 1/28 . . Magnetic plugs and dipsticks
- B03C 1/282 . . . {with associated accumulation indicator, e.g. Hall sensor}
- B03C 1/284 . . . {with associated cleaning means, e.g. retractable non-magnetic sleeve}
- B03C 1/286 . . . {disposed at the inner circumference of a recipient, e.g. magnetic drain bolt}
- B03C 1/288 . . . {disposed at the outer circumference of a recipient}
- B03C 1/30 . . Combinations with other devices, not otherwise provided for
- B03C 1/32 . acting on the medium containing the substance being separated, e.g. magnetogravimetric-, magnetohydrostatic-, or magnetohydrodynamic separation {(sink-float separation using heavy liquids or suspensions [B03B 5/30](#))}

B03C 3/00 **Separating dispersed particles from gases or vapour, e.g. air, by electrostatic effect** {(use of electrostatic separators in combination with exhausts of machines or internal combustion machines [F01N 3/01](#))}

- B03C 3/01 . Pretreatment of the gases prior to electrostatic precipitation
- B03C 3/011 . . Prefiltering; Flow controlling
- B03C 3/013 . . Conditioning by chemical additives, e.g. with SO₃
- B03C 3/014 . . Addition of water; Heat exchange, e.g. by condensation
- B03C 3/016 . . by acoustic or electromagnetic energy, e.g. ultra-violet light
- B03C 3/017 . Combinations of electrostatic separation with other processes, not otherwise provided for
- B03C 3/0175 . . {Amassing particles by electric fields, e.g. agglomeration}
- B03C 3/019 . Post-treatment of gases
- B03C 3/02 . Plant or installations having external electricity supply ([electrode constructions B03C 3/40](#))
- B03C 3/025 . . {Combinations of electrostatic separators, e.g. in parallel or in series, stacked separators, dry-wet separator combinations}
- B03C 3/04 . . dry type
- B03C 3/06 . . . characterised by presence of stationary tube electrodes
- B03C 3/08 . . . characterised by presence of stationary flat electrodes arranged with their flat surfaces parallel to the gas stream
- B03C 3/09 . . . characterised by presence of stationary flat electrodes arranged with their flat surfaces at right angles to the gas stream

- B03C 3/10 . . . characterised by presence of electrodes moving during separating action
- B03C 3/12 . . . characterised by separation of ionising and collecting stations
- B03C 3/14 . . . characterised by the additional use of mechanical effects, e.g. gravity
([B03C 3/32 takes precedence](#))
- B03C 3/145 Inertia
- B03C 3/15 Centrifugal forces
- B03C 3/155 Filtration
- B03C 3/16 . . wet type
- B03C 3/28 . Plant or installations without electricity supply, e.g. using electrets
- B03C 3/30 . . in which electrostatic charge is generated by passage of the gases, i.e. tribo-electricity
- B03C 3/32 . Transportable units, e.g. for cleaning room air ([room air-conditioners having an electrostatic separating stage F24F](#))
- B03C 3/34 . Constructional details or accessories or operation thereof
- B03C 3/36 . . Controlling flow of gases or vapour
- B03C 3/361 . . . {by static mechanical means, e.g. deflector}
- B03C 3/363 {located before the filter}
- B03C 3/365 {located after the filter}
- B03C 3/366 {located in the filter, e.g. special shape of the electrodes}
- B03C 3/368 . . . {by other than static mechanical means, e.g. internal ventilator or recycler}
- B03C 3/38 . . Particle charging or ionising stations, e.g. using electric discharge, radioactive radiation, flames ([electrode constructions B03C 3/40](#); [ionising gases H05H](#))
- B03C 3/383 . . . {using radiation}
- B03C 3/386 . . . {using flames}
- B03C 3/40 . . Electrode constructions
- B03C 3/41 . . . Ionising-electrodes
- B03C 3/43 radioactive
- B03C 3/45 . . . Collecting-electrodes
- B03C 3/455 {specially adapted for heat exchange with the gas stream ([B03C 3/53 takes precedence](#))}
- B03C 3/47 flat, e.g. plates, discs, gratings
- B03C 3/49 tubular {([B03C 3/455 takes precedence](#))}
- B03C 3/51 Catch- space electrodes, e.g. slotted-box form
- B03C 3/53 Liquid, or liquid-film, electrodes
- B03C 3/60 . . . Use of special materials other than liquids
- B03C 3/62 ceramics
- B03C 3/64 synthetic resins
- B03C 3/66 . . Applications of electricity supply techniques
- B03C 3/68 . . . Control systems therefor
- B03C 3/70 . . . insulating in electric separators ([B03C 3/53 takes precedence](#))
- B03C 3/72 . . Emergency control systems

- B03C 3/74 . . . Cleaning the electrodes
- B03C 3/743 . . . {by using friction, e.g. by brushes or sliding elements}
- B03C 3/746 {Electricity supply or control systems therefor}
- B03C 3/76 . . . by using a mechanical vibrator, e.g. rapping gear; {by using impact}
- B03C 3/761 {Drive-transmitting devices therefor, e.g. insulated shafts}
- B03C 3/763 {Electricity supply or control systems therefor}
- B03C 3/765 {with electromagnetic rappers}
- B03C 3/766 {with pneumatic rappers}
- B03C 3/768 {with free falling masses, e.g. dropped metal balls}
- B03C 3/78 . . . by washing
- B03C 3/80 . . . by gas or solid particle blasting
- B03C 3/82 . . . Housings
- B03C 3/84 . . . Protective coatings
- B03C 3/86 . . . Electrode-carrying means ([B03C 3/40](#) takes precedence)
- B03C 3/88 . . . Cleaning-out collected particles
- B03C 3/885 . . . {by travelling or oscillating electric fields, e.g. electric field curtains ([electrostatic non-mechanical conveyers in general B65G 54/02](#))}

B03C 5/00**Separating dispersed particles from liquids by electrostatic effect**

{floculation or agglomeration of electric particles induced by electric field [B01D 21/0009](#); microreactors [B01J 19/0093](#); combined with centrifuges [B04B 5/10](#); {treatment of microorganisms and apparatus therefor [C12M 1/42](#), [C12N 13/00](#), [C12Q 1/24](#); analysis of biomaterial by electrical means [G01N 33/48707](#))}

NOTE

In this group, the following term is used with the meaning indicated:

- "separating" means dimensional modifications of particle-liquid distributions, e.g. particle immobilisation, caging, translational or rotational motion

- B03C 5/005 . . {Dielectrophoresis, i.e. dielectric particles migrating towards the region of highest field strength ([B03C 5/02](#) takes precedence; electrophoresis [B01D 57/02](#))}
- B03C 5/02 . . Separators
- B03C 5/022 . . . {Non-uniform field separators}
- B03C 5/024 {using high-gradient differential dielectric separation, i.e. using a dielectric matrix polarised by an external field}
- B03C 5/026 {using open-gradient differential dielectric separation, i.e. using electrodes of special shapes for non-uniform field creation, e.g. Fluid Integrated Circuit [FIC]}
- B03C 5/028 {using travelling electric fields, i.e. travelling wave dielectrophoresis [TWD]}

B03C 7/00**Separating solids from solids by electrostatic effect**

- B03C 7/003 . . {Pretreatment of the solids prior to electrostatic separation}
- B03C 7/006 . . {Charging without electricity supply, e.g. by tribo-electricity, pyroelectricity}
- B03C 7/02 . . Separators

B03C 7/023	. . {Non-uniform field separators}
B03C 7/026	. . . {using travelling or oscillating electric fields}
B03C 7/04	. . with material carriers in the form of trays, troughs, or tables
B03C 7/06	. . with cylindrical material carriers
B03C 7/08	. . with material carriers in the form of belts
B03C 7/10	. . with material falling in cascades
B03C 7/12	. . with material falling free
B03C 9/00	Electrostatic separation not provided for in a single preceding main group
B03C 11/00	Separation by high-voltage electrical fields, not provided for in other groups of this subclass
B03C 2201/00	Details of magnetic or electrostatic separation
B03C 2201/02	. Electro-statically separating liquids from liquids
B03C 2201/04	. Ionising electrode being a wire
B03C 2201/06	. Ionising electrode being a needle
B03C 2201/08	. Ionising electrode being a rod
B03C 2201/10	. Ionising electrode has multiple serrated ends or parts
B03C 2201/12	. Cleaning the device by burning the trapped particles
B03C 2201/14	. the gas being moved electro-kinetically
B03C 2201/16	. Magnetic separating gases from gases e.g. oxygen from air
B03C 2201/18	. Magnetic separation whereby the particles are suspended in a liquid
B03C 2201/20	. Magnetic separation whereby the particles to be separated are in solid form
B03C 2201/22	. characterised by the magnetical field, special shape or generation
B03C 2201/24	. for measuring or calculating parameters, efficiency, etc.
B03C 2201/26	. for use in medical applications
B03C 2201/28	. Parts being easily removable for cleaning purposes
B03C 2201/30	. for use in or with vehicles
B03C 2201/32	. Checking the quality of the result or the well-functioning of the device