

CPC COOPERATIVE PATENT CLASSIFICATION

B04C **APPARATUS USING FREE VORTEX FLOW, e.g. CYCLONES** ({centrifugal separation of water from steam [B01D 45/12](#); } jet mills [B02C 19/06](#); {wind sifters [B07B 7/00](#); } cyclonic type combustion apparatus [F23](#); {vortex burners for cyclone-type combustion apparatus [F23D 1/02](#); cyclonic type combustion apparatus for gas turbines [F23R 3/00](#)})

NOTE

This subclass covers apparatus for separating, mixing or like treating in which centrifugal effects are generated by free vortex flow, otherwise than by rotary bowls, rotors or curved passages.

1/00	Apparatus in which the main direction of flow follows a flat spiral; {so-called flat cyclones or vortex chambers}	5/14	• Construction of the underflow ducting; Apex constructions; Discharge arrangements; {discharge through sidewall provided with a few slits or perforations (provided with a great number of slits or perforations B04C 5/10)}
3/00	Apparatus in which the axial direction of the vortex {(flow following a screw-thread type line)} remains unchanged {Also devices in which one of the two discharge ducts returns centrally through the vortex chamber, a reverse-flow vortex being prevented by bulkheads in the central discharge duct (combined with other devices B04C 9/00)}	5/15	• • with swinging flaps or revolving sluices; Sluices; Check-valves
2003/003	• {Shapes or dimensions of vortex chambers}	5/16	• • with variable-size outlets from the underflow ducting
2003/006	• {Construction of elements by which the vortex flow is generated or degenerated}	5/18	• • with auxiliary fluid assisting discharge
3/02	• with heating or cooling, e.g. quenching, means	5/181	• • Bulkheads or central bodies in the discharge opening
3/04	• Multiple arrangement thereof {(combined with types according to other groups, B04C 7/00)}	5/185	• • Dust collectors
3/06	• Construction of inlets or outlets to the vortex chamber	5/187	• • • forming an integral part of the vortex chamber
5/00	Apparatus in which the axial direction of the vortex is reversed {(combined with other devices B04C 9/00)}	5/20	• with heating or cooling, e.g. quenching, means
5/02	• Construction of inlets by which the vortex flow is generated {, e.g. tangential admission, the fluid flow being forced to follow a downward path by spirally wound bulkheads, or with slightly downwardly-directed tangential admission} (fluid dynamics in general F15D)	5/22	• with cleaning means
5/04	• • Tangential inlets	5/23	• • using liquids
5/06	• • Axial inlets	5/24	• Multiple arrangement thereof {(combination types according to other /00 groups, B04C 7/00)}
5/08	• Vortex chamber constructions	5/26	• • for series flow
5/081	• • Shapes or dimensions	5/28	• • for parallel flow
5/085	• • with wear-resisting arrangements	5/30	• • Recirculation constructions in or with cyclones which accomplish a partial recirculation of the medium, e.g. by means of conduits
5/087	• • with flexible gas-tight walls	7/00	Apparatus not provided for in group B04C 1/00, B04C 3/00, or B04C 5/00; Multiple arrangements not provided for in one of the groups B04C 1/00, B04C 3/00, or B04C 5/00; Combinations of apparatus covered by two or more of the groups B04C 1/00, B04C 3/00, or B04C 5/00
5/10	• • with perforated walls	9/00	Combinations with other devices, e.g. fans, {expansion chambers, diffusors, water locks} (with filters B01D 50/00)
5/103	• • Bodies or members, e.g. bulkheads, guides, in the vortex chamber (cores B04C 5/107)	2009/001	• {with means for electrostatic separation}
5/107	• • Cores; Devices for inducing an air-core in hydrocyclones (forming part of the outlet pipe B04C 5/13)	2009/002	• {with external filters}
5/12	• Construction of the overflow ducting, e.g. diffusing or spiral exits	2009/004	• {with internal filters, in the cyclone chamber or in the vortex finder}
5/13	• • formed as a vortex finder and extending into the vortex chamber {(exits with bulkheads preventing reverse flow vortex B04C 3/00)}; Discharge from vortex finder otherwise than at the top of the cyclone; Devices for controlling the overflow	2009/005	• {with external rotors, e.g. impeller, ventilator, fan, blower, pump}
2005/133	• • • {Adjustable vortex finder}	2009/007	• {with internal rotors, e.g. impeller, ventilator, fan, blower, pump}
2005/136	• • • {Baffles in the vortex finder}	2009/008	• {with injection or suction of gas or liquid into the cyclone}
		11/00	Accessories, e.g. safety or control devices, not otherwise provided for {, e.g. regulators, valves in inlet or overflow ducting} (with electrostatic precipitating arrangements B03C 3/14)