

CPC COOPERATIVE PATENT CLASSIFICATION

F MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING (NOTE omitted)

ENGINES OR PUMPS

F03 MACHINES OR ENGINES FOR LIQUIDS (for liquid and gases [F01](#); positive-displacement machines for liquids [F04](#)); WIND, SPRING WEIGHT AND MISCELLANEOUS MOTORS; PRODUCING MECHANICAL POWER; OR A REACTIVE PROPULSIVE THRUST, NOT OTHERWISE PROVIDED FOR

F03B MACHINES OR ENGINES FOR LIQUIDS (positive-displacement engines for liquid [F03C](#); machines for liquids and gases [F01](#); positive-displacement machines for liquids [F04](#), rotary fluid gearing of the hydrokinetic type [F16H 41/00](#))

NOTES

1. Attention is drawn to the notes preceding Class [F01](#), especially as regards the definition of "reaction type".
2. This subclass comprises:
 - engines, other than of positive-displacement type, driven by liquids;
 - machines, other than of positive-displacement type, for liquids.

Non-positive-displacement machines or engines characterised by specified type, e.g. water turbines (adaptations of machines or engines for special use [F03B 13/00](#); controlling [F03B 15/00](#))

- 1/00 Engines of impulse type, i.e. turbines with jets of high-velocity liquid impinging on blades or like rotors, e.g. Pelton wheels; Parts or details peculiar thereto**
- 1/02 . Buckets; Bucket-carrying rotors
- 1/04 . Nozzles (in general [B05B](#)); Nozzle-carrying members
- 3/00 Machines or engines of reaction type; Parts or details peculiar thereto**
- 3/02 . with radial flow at high-pressure side and axial flow at low-pressure side of rotors, e.g. Francis turbines {rotors per se [F03B 3/125](#)}
- 3/04 . with substantially axial flow throughout rotors, e.g. propeller turbines {rotors per se [F03B 3/126](#)}
- 3/06 . . with adjustable blades, e.g. Kaplan turbines {rotors per se [F03B 3/14](#)}
- 3/08 . with pressure-velocity transformation exclusively in rotors
- 3/10 . characterised by having means for functioning alternatively as pumps or turbines {starting [F03B 15/005](#)}
- 3/103 . . {the same wheel acting as turbine wheel and as pump wheel}
- 3/106 . . {the turbine wheel and the pumps wheel being mounted in adjacent positions on the same shaft in a single casing}
- 3/12 . Blades; Blade-carrying rotors
- 3/121 . . {Blades, their form or construction}
- 3/123 . . . {specially designed as adjustable blades, e.g. for Kaplan-type turbines}
- 3/125 . . {Rotors for radial flow at high-pressure side and axial flow at low-pressure side, e.g. for Francis-type turbines}

- 3/126 . . {Rotors for essentially axial flow, e.g. for propeller turbines (with adjustable blades [F03B 3/14](#))}
- 3/128 . . {Mounting, demounting}
- 3/14 . . Rotors having adjustable blades {(blade form or construction [F03B 3/123](#))}
- 3/145 . . . {Mechanisms for adjusting the blades (if the regulation aspect is preponderant, see [F03B 15/00](#) and subgroups)}
- 3/16 . Stators
- 3/18 . . Stator blades; Guide conduits or vanes, e.g. adjustable {(conduits in dams or the like [F03B 13/08](#); arrangement of valves [F03B 11/004](#))}
- 3/183 . . . {Adjustable vanes, e.g. wicket gates}
- 3/186 . . . {Spiral or volute casings}
- 5/00 Machines or engines characterised by non-bladed rotors, e.g. serrated, using friction**
- 7/00 Water wheels {(of swinging flap type [F03B 17/06](#))}**
- 7/003 . {with buckets receiving the liquid}
- 7/006 . {of the endless-chain type}
- 9/00 Endless-chain machines or engines**
- 9/005 . {with buckets receiving the liquid}
- 11/00 Parts or details not provided for in, or of interest apart from, the preceding groups (controlling [F03B 15/00](#), {e.g. wear-protection couplings, between turbine and generator})**
- 11/002 . {Injecting air or other fluid ([F03D 80/40](#), [F03B 11/04](#), [F03B 15/00](#) take precedence)}
- 11/004 . {Valve arrangements ([F03B 3/10](#) takes precedence; adjustable wicket gates [F03B 3/183](#); valves in general [F16K](#))}
- 11/006 . {Sealing arrangements ([F03B 3/14](#), [F03B 3/183](#), [F03B 13/083](#) takes precedence; sealings in general [F16J](#))}

11/008	. {Measuring or testing arrangements (in general G01)}	13/185	. . . . . {not vertically}
11/02	. Casings {(spiral or volute casings F03B 3/186)}	13/1855	. . . . . {where the connection between wom and conversion system takes tension and compression (F03B 13/187, F03B 13/1875 take precedence)}
11/025	. . {Covers}		
11/04	. for diminishing cavitation or vibration, e.g. balancing	13/186	. . . . . {the connection being of the rack-and-pinion type}
11/06	. Bearing arrangements	13/1865	. . . . . {where the connection between wom and conversion system takes tension only (F03B 13/187, F03B 13/1875 take precedence)}
11/063	. . {Arrangements for balancing axial thrust}		
11/066	. . . {in vertical axis machines}	13/187	. . . . . {and the wom directly actuates the piston of a pump}
11/08	. for removing foreign matter, e.g. mud	13/1875	. . . . . {and the wom is the piston or the cylinder in a pump}
13/00	Adaptations of machines or engines for special use; Combinations of machines or engines with driving or driven apparatus (if the apparatus aspects are predominant, see the relevant subclasses for such apparatus, e.g. H02K 7/18); Power stations or aggregates (incorporating only machines or engines of positive-displacement type F03C; hydraulic engineering aspects E02B; {combinations with wind energy converters F03D 9/008})	13/188	. . . . . {and the wom is flexible or deformable}
13/02	. Adaptations for drilling wells	13/1885	. . . . . {and the wom is tied to the rem}
13/04	. Adaptations for use in dentistry {for driving tools or the like having relatively small outer diameter, e.g. pipe cleaning tools}	13/189	. . . . . {acting directly on the piston of a pump}
13/06	. Stations or aggregates of water-storage type, {e.g. comprising a turbine and a pump} (turbines characterised by having means for functioning alternatively as pumps F03B 3/10)	13/1895	. . . . . {where the tie is a tension/compression member}
13/08	. Machine or engine aggregates in dams or the like; Conduits therefor {, e.g. diffusors (bulb groups F03B 13/105)}	13/20	. . . . wherein both members {, i.e. wom and rem} are movable relative to the sea bed or shore
13/083	. . {The generator rotor being mounted as turbine rotor rim}	13/22	. . . using the flow of water resulting from wave movements to drive a motor or turbine {(F03B 13/144 takes precedence)}
13/086	. . {Plants characterised by the use of siphons; their regulation (siphon weirs E02B 7/18; siphons in general F04F 10/00)}	13/24	. . . to produce a flow of air, e.g. to drive an air turbine {(F03B 13/142 takes precedence)}
13/10	. Submerged units incorporating electric generators or motors	13/26	. . using tide energy
13/105	. . {Bulb groups}	13/262	. . . {using the relative movement between a tide-operated member and another member}
13/12	. characterised by using wave or tide energy	13/264	. . . {using the horizontal flow of water resulting from tide movement}
13/14	. . using wave energy	13/266	. . . {to compress air}
13/141	. . . {with a static energy collector}	13/268	. . . {making use of a dam}
13/142	. . . . {which creates an oscillating water column}	15/00	Controlling (controlling in general G05 {; regulation of plants characterised by the use of siphons F03B 13/086})
13/144	. . . . {which lifts water above sea level}	15/005	. {Starting, also of pump-turbines}
13/145	. . . . . {for immediate use in an energy converter}	15/02	. by varying liquid flow
13/147	. . . . . {for later use}	15/04	. . of turbines (rotors having adjustable blades F03B 3/06, F03B 3/14; adjustable guide vanes F03B 3/18; specially adapted for turbines with jets of high-velocity liquid impinging on bladed or like rotors F03B 15/20)
13/148	. . . {using the static pressure increase due to the wave}	15/06	. . . Regulating, i.e. acting automatically
13/16	. . . using the relative movement between a wave-operated member, {i.e. a "wom"} and another member, {i.e. a reaction member or "rem"}	15/08	. . . by speed, e.g. by measuring electric frequency or liquid flow
13/18	. . . . where the other member, {i.e. rem} is fixed, at least at one point, with respect to the sea bed or shore	15/10	. . . . . without retroactive action
13/1805	. . . . . {and the wom is hinged to the rem}	15/12	. . . . . with retroactive action
13/181	. . . . . {for limited rotation}	15/14	. . . . by or of water level
13/1815	. . . . . {with an up-and-down movement}	15/16	. . . . by power output
13/182	. . . . . {with a to-and-fro movement}	15/18	. . . . for safety purposes, e.g. preventing overspeed
13/1825	. . . . . {for 360° rotation}	15/20	. . specially adapted for turbines with jets of high-velocity liquid impinging on bladed or like rotors (nozzles F03B 1/04)
13/183	. . . . . {of a turbine-like wom}	15/22	. . . for safety purposes
13/1835	. . . . . {of an endless-belt type wom}	17/00	Other machines or engines
13/184	. . . . . {of a water-wheel type wom}		
13/1845	. . . . . {and the wom slides relative to the rem}		

- 17/005 . {Installations wherein the liquid circulates in a closed loop (F03B 13/06 takes precedence); Alleged perpetua mobilia of this or similar kind (perpetua mobilia using hydrostatic thrust or buoyancy F03B 17/04)}
- 17/02 . using hydrostatic thrust
- 17/025 . . {and reciprocating motion}
- 17/04 . . Alleged perpetua mobilia {(with closed loop circulation or similar F03B 17/005)}
- 17/06 . using liquid flow {with predominantly kinetic energy conversion}, e.g. of swinging-flap type {, "run-of-river", "ultra-low head" (F03B 13/264 takes precedence)}
- 17/061 . . {with rotation axis substantially in flow direction}
- 17/062 . . {with rotation axis substantially at right angle to flow direction}
- 17/063 . . . {the flow engaging parts having no movement relative to the rotor during its rotation}
- 17/064 {and a rotor of the endless-chain type}
- 17/065 . . . {the flow engaging parts having a cyclic movement relative to the rotor during its rotation}
- 17/066 {and a rotor of the endless-chain type}
- 17/067 {the cyclic relative movement being positively coupled to the movement of rotation}
- 17/068 {and a rotor of the endless-chain type}