

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.

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

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](#))

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| <p>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</p> <p>1/02 . Buckets; Bucket-carrying rotors</p> <p>1/04 . Nozzles (in general B05B); Nozzle-carrying members</p> <p>3/00 Machines or engines of reaction type; Parts or details peculiar thereto</p> <p>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)}</p> <p>3/04 . with substantially axial flow throughout rotors, e.g. propeller turbines {(rotors per se F03B 3/126)}</p> <p>3/06 . . with adjustable blades, e.g. Kaplan turbines {(rotors per se F03B 3/14)}</p> <p>3/08 . with pressure-velocity transformation exclusively in rotors</p> <p>3/10 . characterised by having means for functioning alternatively as pumps or turbines {(starting F03B 15/005)}</p> <p>3/103 . . {the same wheel acting as turbine wheel and as pump wheel}</p> <p>3/106 . . {the turbine wheel and the pumps wheel being mounted in adjacent positions on the same shaft in a single casing}</p> <p>3/12 . Blades; Blade-carrying rotors</p> <p>3/121 . . {Blades, their form or construction}</p> | <p>3/123 . . . {specially designed as adjustable blades, e.g. for Kaplan-type turbines}</p> <p>3/125 . . {Rotors for radial flow at high-pressure side and axial flow at low-pressure side, e.g. for Francis-type turbines}</p> <p>3/126 . . {Rotors for essentially axial flow, e.g. for propeller turbines (with adjustable blades F03B 3/14)}</p> <p>3/128 . . {Mounting, demounting}</p> <p>3/14 . . Rotors having adjustable blades {(blade form or construction F03B 3/123)}</p> <p>3/145 . . . {Mechanisms for adjusting the blades (if the regulation aspect is preponderant, see F03B 15/00 and subgroups)}</p> <p>3/16 . Stators</p> <p>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)}</p> <p>3/183 . . . {Adjustable vanes, e.g. wicket gates}</p> <p>3/186 . . . {Spiral or volute casings}</p> <p>5/00 Machines or engines characterised by non-bladed rotors, e.g. serrated, using friction</p> <p>7/00 Water wheels {(of swinging flap type F03B 17/06)}</p> <p>7/003 . {with buckets receiving the liquid}</p> <p>7/006 . {of the endless-chain type}</p> <p>9/00 Endless-chain machines or engines</p> <p>9/005 . {with buckets receiving the liquid}</p> |
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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}	13/18 where the other member, {i.e. rem} is fixed, at least at one point, with respect to the sea bed or shore
11/002	. {Injecting air or other fluid (F03D 80/40 , F03B 11/04 , F03B 15/00 take precedence)}	13/1805	. . . . . {and the wom is hinged to the rem}
11/004	. {Valve arrangements (F03B 3/10 takes precedence; adjustable wicket gates F03B 3/183 ; valves in general F16K)}	13/181	. . . . . {for limited rotation}
11/006	. {Sealing arrangements (F03B 3/14 , F03B 3/183 , F03B 13/083 takes precedence; sealings in general F16J)}	13/1815	. . . . . {with an up-and-down movement}
11/008	. {Measuring or testing arrangements (in general G01)}	13/182	. . . . . {with a to-and-fro movement}
11/02	. Casings ({spiral or volute casings F03B 3/186)}	13/1825	. . . . . {for 360° rotation}
11/025	. . {Covers}	13/183	. . . . . {of a turbine-like wom}
11/04	. for diminishing cavitation or vibration, e.g. balancing	13/1835	. . . . . {of an endless-belt type wom}
11/06	. Bearing arrangements	13/184	. . . . . {of a water-wheel type wom}
11/063	. . {Arrangements for balancing axial thrust}	13/1845	. . . . . {and the wom slides relative to the rem}
11/066	. . . {in vertical axis machines}	13/185	. . . . . {not vertically}
11/08	. for removing foreign matter, e.g. mud	13/1855	. . . . . {where the connection between wom and conversion system takes tension and compression (F03B 13/187 , F03B 13/1875 take precedence)}
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)}	13/186	. . . . . {the connection being of the rack-and-pinion type}
13/02	. Adaptations for drilling wells	13/1865	. . . . . {where the connection between wom and conversion system takes tension only (F03B 13/187 , F03B 13/1875 take precedence)}
13/04	. Adaptations for use in dentistry {for driving tools or the like having relatively small outer diameter, e.g. pipe cleaning tools}	13/187	. . . . . {and the wom directly actuates 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)	13/1875	. . . . . {and the wom is the piston or the cylinder in a pump}
13/08	. Machine or engine aggregates in dams or the like; Conduits therefor {, e.g. diffusors (bulb groups F03B 13/105)}	13/188	. . . . . {and the wom is flexible or deformable}
13/083	. . {The generator rotor being mounted as turbine rotor rim}	13/1885	. . . . . {and the wom is tied to the rem}
13/086	. . {Plants characterised by the use of siphons; their regulation (siphon weirs E02B 7/18 ; siphons in general F04F 10/00)}	13/189	. . . . . {acting directly on the piston of a pump}
13/10	. Submerged units incorporating electric generators or motors	13/1895	. . . . . {where the tie is a tension/compression member}
13/105	. . {Bulb groups}	13/20	. . . . wherein both members {, i.e. wom and rem} are movable relative to the sea bed or shore
13/12	. characterised by using wave or tide energy	13/22	. . . using the flow of water resulting from wave movements to drive a motor or turbine {(F03B 13/144 takes precedence)}
13/14	. . using wave energy	13/24	. . . to produce a flow of air, e.g. to drive an air turbine {(F03B 13/142 takes precedence)}
13/141	. . . {with a static energy collector}	13/26	. . using tide energy
13/142	. . . . {which creates an oscillating water column}	13/262	. . . {using the relative movement between a tide-operated member and another member}
13/144	. . . . {which lifts water above sea level}	13/264	. . . {using the horizontal flow of water resulting from tide movement}
13/145	. . . . . {for immediate use in an energy converter}	13/266	. . . {to compress air}
13/147	. . . . . {for later use}	13/268	. . . {making use of a dam}
13/148	. . . {using the static pressure increase due to the wave}	15/00	Controlling (controlling in general G05 {; regulation of plants characterised by the use of siphons F03B 13/086)}
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"}	15/005	. {Starting, also of pump-turbines}
		15/02	. by varying liquid flow
		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)
		15/06	. . . Regulating, i.e. acting automatically
		15/08	. . . . by speed, e.g. by measuring electric frequency or liquid flow
		15/10	. . . . . without retroactive action
		15/12	. . . . . with retroactive action
		15/14	. . . . . by or of water level

- 15/16 by power output
- 15/18 for safety purposes, e.g. preventing overspeed
- 15/20 . . specially adapted for turbines with jets of high-velocity liquid impinging on bladed or like rotors ([nozzles F03B 1/04](#))
- 15/22 . . . for safety purposes
- 17/00 Other machines or engines**
- 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}