COOPERATIVE PATENT CLASSIFICATION

MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING

ENGINES OR PUMPS

MACHINES OR ENGINES FOR LIQUIDS; WIND, SPRING, OR WEIGHT MOTORS; PRODUCING MECHANICAL POWER OR A REACTIVE PROPULSIVE THRUST, NOT OTHERWISE PROVIDED FOR

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)

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))
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)

Adaptations for drilling wells

Adaptations for use in dentistry (for driving tools or the like having relatively small outer diameter, e.g. pipe cleaning tools)

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)

Machine or engine aggregates in dams or the like; Conduits therefor (e.g. diffusors { bulb groups F03B 13/05})

Submerged units incorporating electric generators or motors

{ Bulb groups}

characterised by using wave or tide energy

using wave energy

{ with a static energy collector}

{ which creates an oscillating water column}

{ which lifts water above sea level}

{ for immediate use in an energy converter}

{ for later use}

{ using the static pressure increase due to the wave}

{ using the relative movement between a wave-operated member, { i.e. a "wom"} and another member, { i.e. a reaction member or "rem"} where the other member, { i.e. rem} is fixed, at least at one point, with respect to the sea bed or shore

{ and the wom is hinged to the rem}

{ for limited rotation}

{ with an up-and-down movement}

{ with a to-and-fro movement}

{ for 360° rotation}

{ of a turbine-like wom}

{ of an endless-belt type wom}

{ of a water-wheel type wom}

{ (and the wom slides relative to the rem}

{ not vertically}

{ where the connection between wom and conversion system takes tension and compression ( F03B 13/187, F03B 13/1875 take precedence)}

{ (the connection being of the rack-and-pinion type}

{ where the connection between wom and conversion system takes tension only ( F03B 13/187, F03B 13/1875 take precedence)}

{ and the wom directly actuates the piston of a pump}

{ and the wom is the piston or the cylinder in a pump}

{ and the wom is flexible or deformable}

{ and the wom is tied to the rem}

{ (acting directly on the piston of a pump}

{ where the tie is a tension/compression member}

wherein both members {,i.e. wom and rem} are movable relative to the sea bed or shore

using the flow of water resulting from wave movements to drive a motor or turbine ( F03B 13/144 takes precedence)

{ to produce a flow of air, e.g. to drive an air turbine ( F03B 13/144 takes precedence)}

{ using tide energy

{ [using the relative movement between a tide-operated member and another member]

{ [using the horizontal flow of water resulting from tide movement]

{ [to compress air]

{ [making use of a dam]

Controlling (controlling in general G05 ; regulation of plants characterised by the use of siphons F03B 13/086)}

{ Starting, also of pump-turbines}

by varying liquid flow

{ 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)

{ Regulating, i.e. acting automatically

{ by speed, e.g. by measuring electric frequency or liquid flow

{ without retroactive action

{ with retroactive action

{ by or of water level

{ by power output

{ for safety purposes, e.g. preventing overspeed

{ specially adapted for turbines with jets of high-velocity liquid impinging on bladed or like rotors (nozzles F03B 1/04)
Non-positive-displacement machines or engines characterised by specified type, e.g. water turbines

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]