

# 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](#))

##### **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}

<b>11/00</b>	<b>Parts or details not provided for in, or of interest apart from, the preceding groups (controlling <a href="#">F03B 15/00</a>), {e.g. wear-protection couplings, between turbine and generator}</b>	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 ( <a href="#">F03D 80/40</a> , <a href="#">F03B 11/04</a> , <a href="#">F03B 15/00</a> take precedence)}	13/1805	. . . . . {and the wom is hinged to the rem}
11/004	. {Valve arrangements ( <a href="#">F03B 3/10</a> takes precedence; adjustable wicket gates <a href="#">F03B 3/183</a> ; valves in general <a href="#">F16K</a> )}	13/181	. . . . . {for limited rotation}
11/006	. {Sealing arrangements ( <a href="#">F03B 3/14</a> , <a href="#">F03B 3/183</a> , <a href="#">F03B 13/083</a> takes precedence; sealings in general <a href="#">F16J</a> )}	13/1815	. . . . . {with an up-and-down movement}
11/008	. {Measuring or testing arrangements (in general <a href="#">G01</a> )}	13/182	. . . . . {with a to-and-fro movement}
11/02	. Casings {(spiral or volute casings <a href="#">F03B 3/186</a> )}	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 ( <a href="#">F03B 13/187</a> , <a href="#">F03B 13/1875</a> take precedence)}
<b>13/00</b>	<b>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. <a href="#">H02K 7/18</a>); Power stations or aggregates (incorporating only machines or engines of positive-displacement type <a href="#">F03C</a>; hydraulic engineering aspects <a href="#">E02B</a>; {combinations with wind energy converters <a href="#">F03D 9/008</a>)}</b>	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 ( <a href="#">F03B 13/187</a> , <a href="#">F03B 13/1875</a> 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 <a href="#">F03B 3/10</a> )	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 <a href="#">F03B 13/105</a> )}	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 <a href="#">E02B 7/18</a> ; siphons in general <a href="#">F04F 10/00</a> )}	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 {( <a href="#">F03B 13/144</a> takes precedence)}
13/14	. . using wave energy	13/24	. . . . to produce a flow of air, e.g. to drive an air turbine {( <a href="#">F03B 13/142</a> 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}	<b>15/00</b>	<b>Controlling (controlling in general <a href="#">G05</a> {; regulation of plants characterised by the use of siphons <a href="#">F03B 13/086</a>)}</b>
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 <a href="#">F03B 3/06</a> , <a href="#">F03B 3/14</a> ; adjustable guide vanes <a href="#">F03B 3/18</a> ; specially adapted for turbines with jets of high-velocity liquid impinging on bladed or like rotors <a href="#">F03B 15/20</a> )
		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}