SECTION F — MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING

F03 MACHINES OR ENGINES FOR LIQUIDS; WIND, SPRING, OR WEIGHT MOTORS; PRODUCING MECHANICAL POWER OR A REACTIVE PROPULSIVE THRUST, NOT OTHERWISE PROVIDED FOR

F03B **MACHINES OR ENGINES FOR LIQUIDS** (machines or engines for liquids and elastic fluids F01; positive-displacement engines for liquids F03C; positive-displacement machines for liquids F04)

Note(s)

1. This subclass covers:
   - engines, other than of positive-displacement type, driven by liquids;
   - machines, other than of positive-displacement type, for liquids.
2. Attention is drawn to the Notes preceding class F01, especially as regards the definition of "reaction type".

Subclass index

1/00 **Engines of impulse type, i.e. turbines with jets of high-velocity liquid impinging on bladed 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

3/04 • with substantially axial flow throughout rotors, e.g. propeller turbines

3/06 • • with adjustable blades, e.g. Kaplan turbines

3/08 • with pressure/velocity transformation exclusively in rotors

3/10 • characterised by having means for functioning alternatively as pumps or turbines

3/12 • Blades; Blade-carrying rotors

3/14 • • Rotors having adjustable blades

3/16 • Stators

3/18 • • Stator blades; Guide conduits or vanes, e.g. adjustable

5/00 **Machines or engines characterised by non-bladed rotors, e.g. serrated, using friction**

7/00 **Water wheels**

9/00 **Endless-chain type machines or engines**

11/00 **Parts or details not provided for in, or of interest apart from, groups F03B 1/00-F03B 9/00** (controlling F03B 15/00)

11/02 • Casings

11/04 • for diminishing cavitation or vibration, e.g. balancing

11/06 • Bearing arrangements

11/08 • for removing foreign matter, e.g. mud

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 places for such apparatus, e.g. H02K 7/18)**; Power stations or aggregates** (hydraulic-engineering aspects E02B; incorporating only machines or engines of positive-displacement type F03C)

13/02 • Adaptations for drilling wells

13/04 • Adaptations for use in dentistry

13/06 • Stations or aggregates of water-storage type (turbines characterised by having means for functioning alternatively as pumps F03B 3/10)

13/08 • Machine or engine aggregates in dams or the like; Conduits therefor

13/10 • Submerged units incorporating electric generators or motors

13/12 • characterised by using wave or tide energy

13/14 • • using wave energy **[4]**

13/16 • • • using the relative movement between a wave-operated member and another member **[4]**

13/18 • • • • wherein the other member is fixed, at least at one point, with respect to the sea bed or shore **[4]**
13/20 • • • • wherein both members are movable relative to the sea bed or shore **[4]**
13/22 • • • using the flow of water resulting from wave movements, e.g. to drive a hydraulic motor or turbine **[4]**
13/24 • • • to produce a flow of air, e.g. to drive an air turbine **[4]**
13/26 • • using tide energy **[4]**

15/00 **Controlling** (controlling in general G05)
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**
17/02 • using hydrostatic thrust
17/04 • • Alleged perpetua mobilia
17/06 • using liquid flow, e.g. of swinging-flap type

F03C **POSITIVE-DISPLACEMENT ENGINES DRIVEN BY LIQUIDS** (positive-displacement engines for liquids and elastic fluids F01; positive-displacement machines for liquids F04; fluid-pressure actuators F15B; fluid gearing F16H)

Note(s)

Attention is drawn to the Notes preceding class F01, especially as regards the definitions of "positive displacement", "rotary-piston machines", "oscillating-piston machines", "rotary-piston", "co-operating members", "movement of co-operating members", "teeth or tooth-equivalents", and "internal axis".

1/00 **Reciprocating-piston liquid engines**
1/007 • with single cylinder, double-acting piston **[5]**
1/013 • with single cylinder, single-acting piston **[5]**
1/02 • with multiple cylinders, characterised by the number or arrangement of cylinders (with movable cylinders F03C 1/22; of flexible-wall type F03C 7/00)
1/03 • • with movement in two directions being obtained by two single-acting piston liquid engines, each acting in one direction **[5]**
1/04 • • with cylinders in star- or fan-arrangement
1/047 • • • the pistons co-operating with an actuated element at the outer ends of the cylinders **[5]**
1/053 • • • the pistons co-operating with an actuated element at the inner ends of the cylinders **[5]**
1/06 • • with cylinder axes generally coaxial with, or parallel or inclined to, main shaft axis
1/08 • Distributing valve-gear peculiar thereto (for multiple-cylinder engines F03C 1/34; for engines with positive displacement in general F01L)
1/10 • • actuated by piston or piston-rod
1/12 • • • mechanically **[5]**
1/14 • • actuated by the driving liquid of the engine **[5]**
1/16 • • Speed controlling, equalising, or cushioning **[5]**
1/20 • • specially adapted for engines generating vibration only
1/22 • with movable cylinders
1/24 • • in which the liquid exclusively displaces one or more pistons reciprocating in rotary cylinders
1/247 • • • with cylinders in star- or fan-arrangement **[5]**
1/253 • • • with cylinder axes generally coaxial with, or parallel to, main shaft axis **[5]**
1/26 • adapted for special use or combined with apparatus driven thereby (aspects predominantly concerning the driven apparatus, see the relevant classes for such apparatus)
1/28 • Pistons specially adapted therefor **[5]**
1/30 • Cams specially adapted therefor **[5]**
1/32 • Cylinders specially adapted therefor **[5]**
1/34 • Distribution members specially adapted for multiple-cylinder engines **[5]**
1/36 • • Cylindrical distribution members **[5]**
1/38 • • Plate-like distribution members **[5]**
1/40 • Control specially adapted therefor **[5]**

2/00 **Rotary-piston engines** (in which the liquid exclusively displaces one or more piston reciprocating in rotary cylinders F03C 1/24) **[3]**

Note(s)

Group F03C 2/30 takes precedence over groups F03C 2/02-F03C 2/24.

2/02 • of arcuate-engagement type, i.e. with circular translatory movement of co-operating members, each member having the same number of teeth or tooth-equivalents **[3]**
2/08 • of intermeshing-engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing **[3]**
2/22 • of internal-axis type with equidirectional movement of co-operating members at the points of engagement, or with one of the co-operating members being stationary, the inner member having more teeth or tooth-equivalents than the outer member **[3]**
2/24 • of counter-engagement type, i.e. the movement of co-operating members at the points of engagement being in opposite directions **[3]**
2/30 • having the characteristics covered by two or more of groups F03C 2/02, F03C 2/08, F03C 2/22, F03C 2/24 or having the characteristics covered by one of these groups together with some other type of movement between co-operating members **[3]**

4/00 **Oscillating-piston engines [3]**

7/00 **Engines of flexible-wall type [2010.01]**

99/00 **Subject matter not provided for in other groups of this subclass [2010.01]**

F03D WIND MOTORS

Note(s)

In this subclass, the following terms or expressions are used with the meanings indicated:

- "wind motor" means a mechanism for converting the energy of natural wind into useful mechanical power, and the transmission of such power to its point of use;
- "rotor" means the wind-engaging parts of the wind motor and the rotary member carrying them;
- "rotation axis" means the axis of rotation of the rotor.

1/00 **Wind motors with rotation axis substantially in wind direction** (controlling F03D 7/00)

1/02 • having a plurality of rotors

1/04 • having stationary wind-guiding means, e.g. with shrouds or channels (F03D 1/02 takes precedence)

1/06 • Rotors

3/00 **Wind motors with rotation axis substantially at right angle to wind direction** (controlling F03D 7/00)

3/02 • having a plurality of rotors

3/04 • having stationary wind-guiding means, e.g. with shrouds or channels (F03D 3/02 takes precedence)

3/06 • Rotors

5/00 **Other wind motors** (controlling F03D 7/00)

5/02 • the wind-engaging parts being attached to endless chains or the like

5/04 • the wind-engaging parts being attached to carriages running on tracks or the like

5/06 • the wind-engaging parts swinging to-and-fro and not rotating

7/00 **Controlling wind motors**

7/02 • the wind motors having rotation axis substantially in wind direction

7/04 • • Regulation, i.e. controlling automatically

7/06 • the wind motors having rotation axis substantially at right angle to wind direction

9/00 **Adaptations of wind motors for special use; Combinations of wind motors with apparatus driven thereby** (aspects predominantly concerning driven apparatus, see the relevant classes for such apparatus)

9/02 • the apparatus storing power

11/00 **Details, component parts, or accessories not provided for in, or of interest apart from, the other groups of this subclass**

11/02 • Transmission of power, e.g. using hollow exhausting blades

11/04 • Mounting structures

F03G SPRING, WEIGHT, INERTIA, OR LIKE MOTORS; MECHANICAL-POWER-PRODUCING DEVICES OR MECHANISMS, NOT OTHERWISE PROVIDED FOR OR USING ENERGY SOURCES NOT OTHERWISE PROVIDED FOR (arrangements in connection with power supply in vehicles from force of nature B60K 16/00; electric propulsion with power supply in vehicles from force of nature B60L 8/00)

Note(s)

In this subclass, the following term is used with the meaning indicated:

- "motors" means mechanisms for producing mechanical power from potential energy of solid bodies.

1/00 **Spring motors** (spring-driven toys A63H; springs in general F16F; precision time mechanisms, e.g. for clocks or watches, G04B)

1/02 • characterised by shape or material of spring, e.g. helical, spiral, coil

1/04 • • using rubber springs

1/06 • Other parts or details

1/08 • • for winding

1/10 • • for producing output movement other than rotary, e.g. vibratory

3/00 **Other motors, e.g. gravity or inertia motors**

3/02 • using wheels with circumferentially-arranged compartments co-operating with solid falling bodies (F03G 3/04 takes precedence)

3/04 • driven by sand or like fluent solid material

3/06 • using pendulums

3/08 • using flywheels

4/00 **Devices for producing mechanical power from geothermal energy [5]**

4/02 • with direct fluid contact **[5]**

4/04 • with deep-well turbo-pump **[5]**

4/06 • with fluid flashing **[5]**

5/00 **Devices for producing mechanical power from muscle energy** (driving cycles B62M)

5/02 • of endless-walk type, e.g. treadmills

5/04 • • Horsemills or the like

5/06 • other than of endless-walk type

5/08 • • for combined actuation by different limbs, e.g. hand and leg

6/00 **Devices for producing mechanical power from solar energy** (solar boilers F24) **[5]**

6/02 • using a single state working fluid **[5]**

6/04 • • gaseous **[5]**

6/06 • with solar energy concentrating means **[5]**

7/00 Mechanical-power-producing mechanisms, not otherwise provided for or using energy sources not otherwise provided for

7/04 • using pressure differences or thermal differences occurring in nature (F03G 7/06 takes precedence)

7/05 • • Ocean thermal energy conversion, i.e. OTEC **[5]**

7/06 • using expansion or contraction of bodies due to heating, cooling, moistening, drying, or the like (using thermal expansion of non-vaporising liquids F01K)

7/08 • recovering energy derived from swinging, rolling, pitching, or like movements, e.g. from the vibrations of a machine

7/10 • Alleged perpetua mobilia (using hydrostatic thrust F03B 17/04)

F03H PRODUCING A REACTIVE PROPULSIVE THRUST, NOT OTHERWISE PROVIDED FOR (from combustion products F02K)

1/00 Use of plasma to produce a reactive propulsive thrust (generating plasma H05H 1/00)

3/00 Use of photons to produce a reactive propulsive thrust

99/00 Subject matter not provided for in other groups of this subclass [2009.01]