

CPC COOPERATIVE PATENT CLASSIFICATION

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

ENGINES OR PUMPS

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

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

Attention is drawn to the notes preceding class [F01](#), especially as regards the meanings 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".

WARNINGS

- The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

| | | |
|----------------------------|------------|---|
| F03C 1/253 | covered by | F03C 1/06 |
| F03C 1/28 | covered by | F03C 1/0406 , F03C 1/0605 |
| F03C 1/30 | covered by | F03C 1/0409 , F03C 1/0631 , F03C 1/0668 |
| F03C 1/32 | covered by | F03C 1/0415 , F03C 1/0626 , F03C 1/0652 |
| F03C 1/34 | covered by | F03C 1/0435 , F03C 1/0615 , F03C 1/0655 |
| F03C 1/36 | covered by | F03C 1/0435 , F03C 1/0615 , F03C 1/0655 |
| F03C 1/38 | covered by | F03C 1/0435 , F03C 1/0615 , F03C 1/0655 |
| F03C 1/40 | covered by | F03C 1/0447 , F03C 1/0678 |

- 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.

| | | | |
|-------------|--|--------|---|
| 1/00 | Reciprocating-piston liquid engines | 1/035 | . . . {one single-acting piston being always under the influence of the liquid under pressure} |
| 1/001 | . {the movement in two directions being obtained by two or more double-acting piston liquid motors} | 1/04 | . . with cylinders in star or fan arrangement { F03C 1/22 takes precedence} |
| 1/002 | . {details; components parts} | 1/0403 | . . . {Details, component parts specially adapted of such engines} |
| 1/003 | . {controlling} | 1/0406 | {Pistons} |
| 1/004 | . . {speed-control} | 1/0409 | {Cams} |
| 1/005 | . . {motor piston stroke control} | 1/0412 | {consisting of several cylindrical elements, e.g. rollers} |
| 1/007 | . with single cylinder, double-acting piston | 1/0415 | {Cylinders} |
| 1/0073 | . . {one side of the double-acting piston being always under the influence of the liquid under pressure} | 1/0419 | {Arrangements for pressing or connecting the pistons against the actuated cam} |
| 1/0076 | . . . {the liquid under pressure being continuously delivered to one cylinder chamber through a valve in the piston for actuating the return stroke} | 1/0422 | {hydraulically} |
| 1/013 | . with single cylinder, single-acting piston | 1/0425 | {Disconnecting the pistons from the actuated cam (in general F01B 31/24)} |
| 1/0135 | . . {with actuation of the return stroke by gravity} | 1/0428 | {Supporting and guiding means for the pistons} |
| 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) | 1/0431 | {Draining of the engine housing; arrangements dealing with leakage fluid} |
| 1/03 | . . with movement in two directions being obtained by two single-acting piston liquid engines, each acting in one direction | 1/0435 | {Particularities relating to the distribution members (F03C 1/0472 , F03C 1/0531 , and F03C 1/0538 take precedence)} |
| | | 1/0438 | {to cylindrical distribution members} |
| | | 1/0441 | {to conical distribution members} |

- 1/0444 {to plate-like distribution members}
- 1/0447 . . . {Controlling}
- 1/045 {by using a valve in a system with several pump or motor chambers, wherein the flow path through the chambers can be changed, e.g. series-parallel}
- 1/0454 {by changing the effective cross sectional piston working surface}
- 1/0457 {by changing the effective piston stroke}
- 1/046 {by changing the excentricity of one element relative to another element}
- 1/0463 {by changing the phase relationship between two actuated cams}
- 1/0466 {by changing the phase relationship between the actuated cam and the distributing means}
- 1/047 the pistons co-operating with an actuated element at the outer ends of the cylinders
- 1/0472 {with cam-actuated distribution members}
- 1/0474 {with two or more radial piston/cylinder units in series}
- 1/0476 {directly located side by side}
- 1/0478 {having several cylinder barrels coupled together}
- 1/053 the pistons co-operating with an actuated element at the inner ends of the cylinders
- 1/0531 {with cam-actuated distribution members}
- 1/0533 {each piston being provided with channels coacting with the cylinder and being used as a distribution member for another cylinder}
- 1/0535 {with two or more radial piston/cylinder units in series}
- 1/0536 {directly located side by side}
- 1/0538 {the piston-driven cams being provided with inlets or outlets}
- 1/06 with cylinder axes generally coaxial with, or parallel or inclined to, main shaft axis
- 1/0602 {Component parts, details}
- 1/0605 {Adaptations of pistons (pump pistons [F04B 1/124](#), [F04B 53/14](#))}
- 1/0607 {Driven means}
- 1/061 {having stationary cylinders}
- 1/0613 {having two or more sets of cylinders or pistons}
- 1/0615 {distributing members}
- 1/0618 {cylindrical distribution members}
- 1/0621 {conical distribution members}
- 1/0623 {Details, component parts}
- 1/0626 {Cylinders}
- 1/0628 {Casings, housings}
- 1/0631 {Wobbler or actuated element}
- 1/0634 {Actuated element bearing means or driven axis bearing means}
- 1/0636 {having rotary cylinder block}
- 1/0639 {having two or more sets of cylinders or pistons}
- 1/0642 {inclined on main shaft axis}
- 1/0644 {Component parts}
- 1/0647 {Particularities in the contacting area between cylinder barrel and valve plate}
- 1/0649 {Bearing means}
- 1/0652 {Cylinders}
- 1/0655 {Valve means}
- 1/0657 {Cylindrical valve means}
- 1/066 {Conical valve means}
- 1/0663 {Casings, housings}
- 1/0665 {Cylinder barrel bearing means}
- 1/0668 {Swash or actuated plate}
- 1/0671 {Swash or actuated plate bearing means or driven axis bearing means}
- 1/0673 {Connection between rotating cylinder and rotating inclined swash plate}
- 1/0676 {Arrangement for pressing the cylinder barrel against the valve plate}
- 1/0678 {Control}
- 1/0681 {using a valve in a system with several motor chambers, wherein the flow path through the chambers can be changed}
- 1/0684 {using a by-pass valve}
- 1/0686 {by changing the inclination of the swash plate}
- 1/0689 {using wedges}
- 1/0692 {by changing the phase relationship between the actuated element and the distribution means, e.g. turning the valve plate; turning the swash plate}
- 1/0694 {by changing the inclination of the axis of the cylinder barrel in relation to the axis of the actuated element}
- 1/0697 {responsive to the speed}
- 1/08 Distributing valve-gear peculiar thereto ([for engines with positive-displacement in general F01L](#); [{F03C 1/06 takes precedence}](#))
- 1/10 actuated by piston or piston-rod
- 1/12 mechanically
- 1/14 by driving liquid of engine
- 1/16 Speed controlling, equalising or cushioning
- 1/20 specially adapted for engines generating vibration only
- 1/22 with movable cylinders {or cylinder}
- 1/223 {having cylinders in star or fan arrangement, the connection of the pistons with an actuated element being at the inner ends of the cylinders}
- 1/226 {with cam actuated distribution members}
- 1/24 in which the liquid exclusively displaces one or more pistons reciprocating in rotary cylinders ([{F03C 1/0636 takes precedence}](#))
- 1/2407 {having cylinders in star or fan arrangement, the connection of the pistons with an actuated element being at the outer ends of the cylinders}
- 1/2415 {cylinder block and actuated cam both rotating ([F03C 1/2431](#) and [F03C 1/2446 take precedence](#))}
- 1/2423 {with two or more series radial piston-cylinder units}
- 1/2431 {cylinder block and actuated cam both rotating ([F03C 1/2446 takes precedence](#))}
- 1/2438 {directly located side by side}
- 1/2446 {cylinder block and actuated cam both rotating}
- 1/2454 {having cylinders in star or fan arrangement, the connection of the pistons with an actuated element being at the inner ends of the cylinders}
- 1/2462 {the rotary cylinder being provided with only one piston reciprocating within this cylinder}

F03C

- 1/247 . . . with cylinders in star- or fan-arrangement
{, the connection of the pistons with an actuated element being at the outer ends of the cylinders}
- 1/26 . adapted for special use or combined with apparatus driven thereby

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

NOTE

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
- 2/08 . of intermeshing-engagement type, i.e. with engagement of co- operating members similar to that of toothed gearing
- 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
- 2/24 . of counter-engagement type, i.e. the movement of co-operating members at the points of engagement being in opposite directions
- 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
- 2/302 . . {having both the movements defined in sub-groups [F03C 2/02](#) and relative reciprocation between members}
- 2/304 . . {having both the movements defined in sub-group [F03C 2/08](#) or [F03C 2/22](#) and relative reciprocation between members}
- 2/306 . . {having both the movements defined in sub-groups [F03C 2/22](#) and [F03C 2/24](#)}
- 2/308 . . {having the movement defined in [F03C 2/08](#) and having a hinged member}

4/00 Oscillating-piston engines

7/00 Engines of flexible-wall type

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

- 99/005 . {Free-piston type engines }