

CPC**COOPERATIVE PATENT CLASSIFICATION****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".

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

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

F03C 1/00**Reciprocating-piston liquid engines**

F03C 1/001

- {the movement in two directions being obtained by two or more double-acting piston liquid motors}

F03C 1/002

- {details; components parts}

F03C 1/003

- {controlling}

F03C 1/004

- • {speed-control}

F03C 1/005

- • {motor piston stroke control}

F03C 1/007

- with single cylinder, double-acting piston

F03C 1/0073

- • {one side of the double-acting piston being always under the influence of the liquid under pressure}

F03C 1/0076

- • • {the liquid under pressure being continuously delivered to one cylinder chamber through a valve in the piston for actuating the return stroke}

F03C 1/013

- with single cylinder, single-acting piston

F03C 1/0135

- • {with actuation of the return stroke by gravity}

- F03C 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)
- F03C 1/03
 - with movement in two directions being obtained by two single-acting piston liquid engines, each acting in one direction
- F03C 1/035
 - {one single-acting piston being always under the influence of the liquid under pressure}
- F03C 1/04
 - with cylinders in star or fan arrangement {(F03C 1/22 takes precedence)}
- F03C 1/0403
 - {Details, component parts specially adapted of such engines}
- F03C 1/0406
 - {Pistons}
- F03C 1/0409
 - {Cams}
- F03C 1/0412
 - {consisting of several cylindrical elements e.g. rollers}
- F03C 1/0415
 - {Cylinders}
- F03C 1/0419
 - {Arrangements for pressing or connecting the pistons against the actuated cam}
- F03C 1/0422
 - {hydraulically}
- F03C 1/0425
 - {Disconnecting the pistons from the actuated cam (in general F01B 31/24)}
- F03C 1/0428
 - {Supporting and guiding means for the pistons}
- F03C 1/0431
 - {Draining of the engine housing; arrangements dealing with leakage fluid}
- F03C 1/0435
 - {Particularities relating to the distribution members (F03C 1/0472, F03C 1/0531, and F03C 1/0538 take precedence)}
- F03C 1/0438
 - {to cylindrical distribution members}
- F03C 1/0441
 - {to conical distribution members}
- F03C 1/0444
 - {to plate-like distribution members}
- F03C 1/0447
 - {Controlling}
- F03C 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}
- F03C 1/0454
 - {by changing the effective cross sectional piston working surface}
- F03C 1/0457
 - {by changing the effective piston stroke}
- F03C 1/046
 - {by changing the excentricity of one element relative to another element}
- F03C 1/0463
 - {by changing the phase relationship between two actuated cams}
- F03C 1/0466
 - {by changing the phase relationship between the actuated cam and the distributing means}
- F03C 1/047
 - the pistons co-operating with an actuated element at the outer ends of the cylinders
- F03C 1/0472
 - {with cam-actuated distribution members}
- F03C 1/0474
 - {with two or more radial piston/cylinder units in series}
- F03C 1/0476
 - {directly located side by side}
- F03C 1/0478
 - {having several cylinder barrels coupled together}
- F03C 1/053
 - the pistons co-operating with an actuated element at the inner ends of the cylinders

F03C 1/0531	. . . . {with cam-actuated distribution members}
F03C 1/0533	. . . . . {each piston being provided with channels coacting with the cylinder and being used as a distribution member for another cylinder}
F03C 1/0535	. . . . {with two or more radial piston/cylinder units in series}
F03C 1/0536	. . . . . {directly located side by side}
F03C 1/0538	. . . . {the piston-driven cams being provided with inlets or outlets}
F03C 1/06	. . with cylinder axes generally coaxial with, or parallel or inclined to, main shaft axis
F03C 1/0602	. . . {Component parts, details}
F03C 1/0605	. . . . {Adaptations of pistons (pump pistons F04B 1/124 , F04B 53/14)}
F03C 1/0607	. . . . {Driven means}
F03C 1/061	. . . {having stationary cylinders}
F03C 1/0613	. . . . {having two or more sets of cylinders or pistons}
F03C 1/0615	. . . . {distributing members}
F03C 1/0618	. . . . . {cylindrical distribution members}
F03C 1/0621	. . . . . {conical distribution members}
F03C 1/0623	. . . . {Details, component parts}
F03C 1/0626	. . . . . {Cylinders}
F03C 1/0628	. . . . . {Casings, housings}
F03C 1/0631	. . . . . {Wobbler or actuated element}
F03C 1/0634	. . . . . . {Actuated element bearing means or driven axis bearing means}
F03C 1/0636	. . . {having rotary cylinder block}
F03C 1/0639	. . . . {having two or more sets of cylinders or pistons}
F03C 1/0642	. . . . . {inclined on main shaft axis}
F03C 1/0644	. . . . {Component parts}
F03C 1/0647	. . . . . {Particularities in the contacting area between cylinder barrel and valve plate}
F03C 1/0649	. . . . . . {Bearing means}
F03C 1/0652	. . . . . {Cylinders}
F03C 1/0655	. . . . . {Valve means}
F03C 1/0657	. . . . . . {Cylindrical valve means}
F03C 1/066	. . . . . . {Conical valve means}
F03C 1/0663	. . . . . {Casings, housings}
F03C 1/0665	. . . . . . {Cylinder barrel bearing means}
F03C 1/0668	. . . . . {Swash or actuated plate}
F03C 1/0671	. . . . . . {Swash or actuated plate bearing means or driven axis bearing means}
F03C 1/0673	. . . . {Connection between rotating cylinder and rotating inclined swash plate}
F03C 1/0676	. . . . {Arrangement for pressing the cylinder barrel against the valve plate}

- F03C 1/0678 . . . {Control}
- F03C 1/0681 {using a valve in a system with several motor chambers, wherein the flow path through the chambers can be changed}
- F03C 1/0684 {using a by-pass valve}
- F03C 1/0686 {by changing the inclination of the swash plate}
- F03C 1/0689 {using wedges}
- F03C 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}
- F03C 1/0694 {by changing the inclination of the axis of the cylinder barrel in relation to the axis of the actuated element}
- F03C 1/0697 {responsive to the speed}
- F03C 1/08 . Distributing valve-gear peculiar thereto (for engines with positive-displacement in general [F01L](#); [F03C 1/06](#) takes precedence)
- F03C 1/10 . . actuated by piston or piston-rod
- F03C 1/12 . . . mechanically
- F03C 1/14 . . by driving liquid of engine
- F03C 1/16 . . Speed controlling, equalising or cushioning
- F03C 1/20 . . specially adapted for engines generating vibration only
- F03C 1/22 . with movable cylinders {or cylinder}
- F03C 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}
- F03C 1/226 . . . {with cam actuated distribution members}
- F03C 1/24 . . in which the liquid exclusively displaces one or more pistons reciprocating in rotary cylinders {(F03C 1/0636 takes precedence)}
- F03C 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}
- F03C 1/2415 {cylinder block and actuated cam both rotating ([F03C 1/2431](#) and [F03C 1/2446](#) take precedence)}
- F03C 1/2423 {with two or more series radial piston-cylinder units}
- F03C 1/2431 {cylinder block and actuated cam both rotating ([F03C 1/2446](#) takes precedence)}
- F03C 1/2438 {directly located side by side}
- F03C 1/2446 {cylinder block and actuated cam both rotating}
- F03C 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}
- F03C 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}
- F03C 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)

F03C 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](#) to [F03C 2/24](#).

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

F03C 4/00 **Oscillating-piston engines**

F03C 7/00 **Engines of flexible-wall type**

F03C 99/00 **Subject matter not provided for in other groups of this subclass**

- [F03C 99/005](#) . {Free-piston type engines}