

CPC**COOPERATIVE PATENT CLASSIFICATION****F01C****ROTARY-PISTON OR OSCILLATING-PISTON MACHINES OR ENGINES** ([internal-combustion aspects F02B 53/00, F02B 55/00](#))**NOTE**

This subclass covers:

- rotary-piston or oscillating-piston engines for elastic fluids, e.g. steam;
- rotary-piston or oscillating-piston engines for liquids and elastic fluids:
- rotary-piston or oscillating-piston machines for elastic fluids;
- rotary-piston or oscillating-piston machines for liquids and elastic fluids.

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

- "rotary-piston machine" includes the German expressions "Drehkolbenmaschinen", "Kreiskolbenmaschinen" and "Umlaufkolbenmaschinen".

Attention is drawn to the Notes preceding class [F01](#), especially as regards the definitions of "rotary-piston machine", "oscillating-piston machine", "rotary piston", "co-operating members", "movement of co-operating members", "teeth or tooth-equivalents" and "internal-axis".

F01C 1/00

Rotary-piston machines or engines ([with axes of co-operating members non parallel F01C 3/00](#); [with the working-chamber walls at least partly resiliently deformable F01C 5/00](#); [with fluid ring or the like F01C 7/00](#); [rotary-piston machines or engines in which the working fluid is exclusively displaced by, or exclusively displaces, one or more reciprocating pistons F01B 13/00](#))

NOTE

Group [F01C 1/30](#) takes precedence over groups [F01C 1/02](#) to [F01C 1/28](#).

F01C 1/02

- . 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

F01C 1/0207

- .. { both members having co-operating elements in spiral form }

F01C 1/0215

- ... { where only one member is moving }

F01C 1/0223

- { with symmetrical double wraps }

F01C 1/023

- ... { where both members are moving }

F01C 1/0238

- { with symmetrical double wraps }

F01C 1/0246

- ... { Details concerning the involute wraps or their base, e.g. geometry }

F01C 1/0253

- { Details concerning the base }

F01C 1/0261

- { Details of the ports, e.g. location, number, geometry }

F01C 1/0269

- { Details concerning the involute wraps }

F01C 1/0276

- { Different wall heights }

- F01C 1/0284 { Details of the wrap tips }
- F01C 1/0292 { Ports or channels located in the wrap }
- F01C 1/04 . . of internal-axis type
- F01C 1/045 . . . { having a C-shaped piston }
- F01C 1/06 . . of other than internal-axis type ([F01C 1/063](#) takes precedence)
- F01C 1/063 . . with coaxially-mounted members having continuously-changing circumferential spacing between them
- F01C 1/067 . . . having cam-and-follower type drive
- F01C 1/07 . . . having crankshaft-and-connecting-rod type drive
- F01C 1/073 . . . having pawl-and-ratchet type drive
- F01C 1/077 . . . having toothed-gearing type drive
- F01C 1/08 . . of intermeshing engagement type, i.e. with engagement of co- operating members similar to that of toothed gearing
- F01C 1/082 . . { Details specially related to intermeshing engagement type machines or engines }
- F01C 1/084 . . . { Toothed wheels }
- F01C 1/086 . . . { Carter }
- F01C 1/088 . . . { Elements in the toothed wheels or the carter for relieving the pressure of fluid imprisoned in the zones of engagement }
- F01C 1/10 . . of internal-axis type with the outer member having more teeth or tooth-equivalents, e.g. rollers, than the inner member
- F01C 1/101 . . . { Moineau-type }
- F01C 1/102 . . . { with a crescent shaped filler element located between the intermeshing elements }
- F01C 1/103 . . . { the two members rotating simultaneously around their respective axes }
- F01C 1/104 . . . { one member having simultaneously a rotational movement about its own axis and an orbital movement }
- F01C 1/105 { and having an articulated driving shaft }
- F01C 1/107 . . . with helical teeth
- F01C 1/113 . . . the inner member carrying rollers intermeshing with the outer member
- F01C 1/12 . . of other than internal-axis type
- F01C 1/123 . . . { with tooth-like elements, extending generally radially from the rotor body cooperating with recesses in the other rotor, e.g. one tooth }
- F01C 1/126 . . . { with elements extending radially from the rotor body not necessarily cooperating with corresponding recesses in the other rotor, e.g. lobes, Roots type }
- F01C 1/14 . . . with toothed rotary pistons
- F01C 1/16 with helical teeth, e.g. chevron-shaped, screw type {([for non-parallel axes of movement F01C 3/00](#))}
- F01C 1/165 { having more than two rotary pistons with parallel axes }
- F01C 1/18 with similar tooth forms ([F01C 1/16](#) takes precedence)
- F01C 1/20 with dissimilar tooth forms ([F01C 1/16](#) takes precedence)
- F01C 1/22 . . of internal-axis type with equidirectional movement of co-operating members at the point 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

- F01C 1/24 . of counter-engagement type, i.e. the movement of co-operating members at the points of engagement being in opposite directions
- F01C 1/26 . . of internal-axis type
- F01C 1/28 . . of other than internal-axis type
- F01C 1/30 . having the characteristics covered by two or more groups [F01C 1/02](#), [F01C 1/08](#), [F01C 1/22](#), [F01C 1/24](#) or having the characteristics covered by one of these groups together with some other type of movement between co-operating members
- F01C 1/32 . . having both the movement defined in group [F01C 1/02](#) and relative reciprocation between the co-operating members
- F01C 1/321 . . . { with vanes hinged to the inner member and reciprocating with respect to the inner member }
- F01C 1/322 . . . { with vanes hinged to the outer member and reciprocating with respect to the outer member }
- F01C 1/324 . . . with vanes hinged to the inner member and reciprocating with respect to the outer member
- F01C 1/328 and hinged to the outer member
- F01C 1/332 . . . with vanes hinged to the outer member and reciprocating with respect to the inner member
- F01C 1/336 and hinged to the inner member
- F01C 1/34 . . having the movement defined in group [F01C 1/08](#) or [F01C 1/22](#) and relative reciprocation between the co-operating members
- F01C 1/344 . . . with vanes reciprocating with respect to the inner member
- F01C 1/3441 { the inner and outer member being in contact along one line or continuous surface substantially parallel to the axis of rotation }
- F01C 1/3442 { the surfaces of the inner and outer member, forming the working space, being surfaces of revolution }
- F01C 1/3443 { with a separation element located between the inlet and outlet opening }
- F01C 1/3445 { the vanes having the form of rollers, slippers or the like }
- F01C 1/3446 { the inner and outer member being in contact along more than one line or surface }
- F01C 1/3447 { the vanes having the form of rollers, slippers or the like }
- F01C 1/3448 { with axially movable vanes }
- F01C 1/348 . . . the vanes positively engaging, with circumferential play, an outer rotatable member
- F01C 1/352 . . . the vanes being pivoted on the axis of the outer member
- F01C 1/356 . . . with vanes reciprocating with respect to the outer member
- F01C 1/3562 { the inner and outer member being in contact along one line or continuous surface substantially parallel to the axis of rotation }
- F01C 1/3564 { the surfaces of the inner and outer member, forming the working space, being surfaces of revolution }
- F01C 1/3566 { the inner and outer member being in contact along more than one line or surface }
- F01C 1/3568 { with axially movable vanes }
- F01C 1/36 . . having both the movements defined in sub-groups [F01C 1/22](#) and [F01C 1/24](#)
- F01C 1/38 . . having the movement defined in group [F01C 1/02](#) and having a hinged member ([F01C 1/32](#) takes precedence)

- F01C 1/39 . . . with vanes hinged to the inner as well as to the outer member
- F01C 1/40 . . having the movement defined in group [F01C 1/08](#) or [F01C 1/22](#) and having a hinged member
- F01C 1/44 . . . with vanes hinged to the inner member
- F01C 1/46 . . . with vanes hinged to the outer member

- F01C 3/00** **Rotary-piston machines or engines with non-parallel axes of movement of co-operating members (with the working-chamber walls being at least partly resiliently deformable [F01C 5/00](#))**

- F01C 3/02 . the axes being arranged at an angle of 90 degrees
- F01C 3/025 . . { of intermeshing engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing }
- F01C 3/04 . . with axially sliding vanes

- F01C 3/06 . the axes being arranged otherwise than at an angle of 90 degrees
- F01C 3/08 . . of intermeshing-engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing
- F01C 3/085 . . . { the axes of cooperating members being on the same plane }

- F01C 5/00** **Rotary-piston machines or engines with the working-chamber walls at least partly resiliently deformable**

- F01C 5/02 . the resiliently-deformable wall being part of the inner member, e.g. of a rotary piston
- F01C 5/04 . the resiliently-deformable wall being part of the outer member, e.g. of a housing
- F01C 5/06 . the resiliently-deformable wall being a separate member
- F01C 5/08 . . of tubular form, e.g. hose

- F01C 7/00** **Rotary-piston machines or engines with fluid ring or the like**

- F01C 9/00** **Oscillating-piston machines or engines**

- F01C 9/002 . { the piston oscillating around a fixed axis }
- F01C 9/005 . { the piston oscillating in the space, e.g. around a fixed point (rotary piston machines or engines with non-parallel axes of rotation between co-operating members [F01C 3/00](#)) }
- F01C 9/007 . { the points of the moving element describing approximately an alternating movement in axial direction with respect to the other element }

- F01C 11/00** **Combinations of two or more machines or engines, each being of rotary-piston or oscillating-piston type ([F01C 13/00](#) takes precedence; combinations of two or more pumps [F04](#); fluid gearing [F16H](#))**

- F01C 11/002 . { of similar working principle }

F01C 11/004 . . { and of complementary function, e.g. internal combustion engine with supercharger }

F01C 11/006 . { of dissimilar working principle }

F01C 11/008 . . { and of complementary function, e.g. internal combustion engine with supercharger }

NOTE

Multi-stage steam engines or similar machines are not considered as having complementary function

F01C 13/00 **Adaptations of machines or engines for special use; Combinations of engines with devices driven thereby** (aspects predominantly concerning driven devices, see the relevant classes for these devices)

F01C 13/02 . for driving hand-held tools or the like

F01C 13/04 . for driving pumps or compressors

F01C 17/00 **Arrangements for drive of co-operating members, e.g. for rotary piston and casing**

F01C 17/02 . of toothed-gearing type ([F01C 1/077](#) takes precedence)

F01C 17/04 . of cam-and-follower type ([F01C 1/067](#) takes precedence)

F01C 17/06 . using cranks, universal joints or similar elements ([F01C 1/07](#) takes precedence)

F01C 17/063 . . { with only rolling movement }

F01C 17/066 . . { with an intermediate piece sliding along perpendicular axes, e.g. Oldham coupling }

F01C 19/00 **Sealing arrangements in rotary-piston machines or engines** (sealings in general [F16J](#))

F01C 19/005 . { Structure and composition of sealing elements such as sealing strips, sealing rings and the like; Coating of these elements (vane construction **F01C 21/08B**; piston rings and ring sealings of similar construction in general [F16J 9/00](#)) }

F01C 19/02 . Radially-movable sealings for working fluid

F01C 19/025 . . { Radial sealing elements specially adapted for intermeshing engagement type machines or engines, e.g. gear machines or engines }

F01C 19/04 . . of rigid material

F01C 19/06 . . of resilient material

F01C 19/08 . Axially-movable sealings for working fluid

F01C 19/085 . . { Elements specially adapted for sealing of the lateral faces of intermeshing-engagement type machines or engines, e.g. gear machines or engines }

F01C 19/10 . Sealings for working fluids between radially and axially movable parts

F01C 19/12	. for other than working fluid
F01C 19/125	.. { Shaft sealings specially adapted for rotary or oscillating-piston machines or engines }
F01C 20/00	Control of, monitoring of, or safety arrangements for, machines or engines
F01C 20/02	. specially adapted for several machines or engines connected in series or in parallel
F01C 20/04	. specially adapted for reversible machines or engines
F01C 20/06	. specially adapted for stopping, starting, idling or no-load operation
F01C 20/08	. characterised by varying the rotational speed
F01C 20/10	. characterised by changing the position of the inlet or outlet openings with respect to the working chamber
F01C 20/12	.. using sliding valves
F01C 20/125	... { with sliding valves controlled by the use of fluid other than the working fluid }
F01C 20/14	.. using rotating valves
F01C 20/16	.. using lift valves
F01C 20/18	. characterised by varying the volume of the working chamber (by changing the positions of inlet or outlet openings F01C 20/10)
F01C 20/185	.. { by varying the useful pumping length of the cooperating members in the axial direction }
F01C 20/20	.. by changing the form of the inner or outlet contour of the working chamber
F01C 20/22	.. by changing the eccentricity between cooperating members
F01C 20/24	. characterised by using valves regulating pressure or flow rate, e.g. discharge valves, unloading valves (F01C 20/10 takes precedence)
F01C 20/26	.. using bypass channels
F01C 20/265	... { being obtained by displacing a lateral sealing face }
F01C 20/28	. Safety arrangements; Monitoring
F01C 21/00	Component parts, details or accessories not provided for in groups F01C 1/00 to F01C 20/00
F01C 21/001	. { Injection of a fluid in the working chamber for sealing, cooling and lubricating (sealing only F01C 17/00 ; lubrication only F01C 21/04 ; cooling only F01C 21/06 ; injecting water or steam in internal combustion engines F02B 47/02 , F02D 21/00 , F02M 25/00) }
F01C 21/002	.. { with control systems for the injection of the fluid }
F01C 21/003	. { Systems for the equilibration of forces acting on the elements of the machine (interstice adjustment other than by fluid pressure F01C 21/102) }
F01C 21/005	.. { Internal leakage control }
F01C 21/006	.. { Equalization of pressure pulses (silencing for compressors F04C 29/06) }

- F01C 21/007 . { General arrangements of parts; Frames and supporting elements }
- F01C 21/008 . { Driving elements, brakes, couplings, transmissions specially adapted for rotary or oscillating-piston machines or engines (brakes, couplings, transmissions per se [F16](#), [B60](#)) }
- F01C 21/02 . Arrangements of bearings (bearing constructions [F16C](#))
- F01C 21/04 . Lubrication (of machines or engines in general [F01M](#))
- F01C 21/045 . . { Control systems for the circulation of the lubricant }
- F01C 21/06 . Heating; Cooling (of machines or engines in general [F01P](#)); Heat insulation (heat insulation in general [F16L](#))
- F01C 21/08 . Rotary pistons (reciprocating piston in general [F16J](#))
- F01C 21/0809 . . { Construction of vanes or vane holders }
- F01C 21/0818 . . . { Vane tracking; control therefor }
- F01C 21/0827 { by mechanical means }
- F01C 21/0836 { comprising guiding means, e.g. cams, rollers }
- F01C 21/0845 { comprising elastic means, e.g. springs }
- F01C 21/0854 { by fluid means }
- F01C 21/0863 { the fluid being the working fluid }
- F01C 21/0872 { the fluid being other than the working fluid }
- F01C 21/0881 . . . { the vanes consisting of two or more parts }
- F01C 21/089 . . . { for synchronised movement of the vanes }
- F01C 21/10 . Outer members for co-operation with rotary pistons; Casings (casings for rotary engines or machines in general [F16M](#))
- F01C 21/102 . . { Adjustment of the interstices between moving and fixed parts of the machine by means other than fluid pressure }
- F01C 21/104 . . { Stators; Members defining the outer boundaries of the working chamber }
- F01C 21/106 . . . { with a radial surface, e.g. cam rings }
- F01C 21/108 . . . { with an axial surface, e.g. side plates }
- F01C 2021/12 . Control of working fluid admission or discharge
- F01C 2021/125 . . Arrangements for supercharging the working space
- F01C 2021/14 . . for variable fluid distribution
- F01C 2021/16 . Other regulation or control
- F01C 2021/1606 . . Variation of the working chamber
- F01C 2021/1612 . . . by changing the eccentricity of an element with respect to another element
- F01C 2021/1618 . . . by changing the positions of the inlet and outlet openings with respect to the working chambers
- F01C 2021/1625 with sliding or rotating valves, adjustable in position
- F01C 2021/1631 with sliding valves controlled by the use of fluid other than the working fluid
- F01C 2021/1637 . . . by changing the form of the radially inner or the radially outer contour of the

- working chamber
- F01C 2021/1643 . . by using valves regulating pressure and flow rate, e.g. discharge valves
- F01C 2021/165 . . . using a by-pass channel
- F01C 2021/1656 being obtained by displacing a lateral sealing face
- F01C 2021/1662 . . . with venting means
- F01C 2021/1668 . . with several machines or engines connected in series or in parallel
- F01C 2021/1675 . . with reversible machines or engines
- F01C 2021/1681 . . by varying the rotational speed
- F01C 2021/1687 . . Safety arrangements
- F01C 2021/1693 . . Stopping or starting, idling or no-load operation

- F01C 21/18 . Arrangements for admission or discharge of the working fluid, e.g. constructional features of the inlet or outlet
- F01C 21/183 . . { Arrangements for supercharging the working space (similar arrangements for internal combustion engines [F02B 33/00](#), [F02B 27/00](#)) }
- F01C 21/186 . . { for variable fluid distribution }