

**CPC****COOPERATIVE PATENT CLASSIFICATION****F01C****ROTARY-PISTON OR OSCILLATING-PISTON MACHINES OR ENGINES** ([internal-combustion aspects F02B 53/00, 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 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 }   |
| <b>F01C 20/00</b> | <b>Control of, monitoring of, or safety arrangements for, machines or engines</b>   |
| 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 <a href="#">F01C 20/10</a> )  |
| 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 ( <a href="#">F01C 20/10</a> 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   |
| <b>F01C 21/00</b> | <b>Component parts, details or accessories not provided for in groups <a href="#">F01C 1/00</a> to <a href="#">F01C 20/00</a></b>   |
| F01C 21/001       | . {Injection of a fluid in the working chamber for sealing, cooling and lubricating (sealing only <a href="#">F01C 17/00</a> ; lubrication only <a href="#">F01C 21/04</a> ; cooling only <a href="#">F01C 21/06</a> ; injecting water or steam in internal combustion engines <a href="#">F02B 47/02</a> , <a href="#">F02D 21/00</a> , <a href="#">F02M 25/00</a> ) } |
| 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 <a href="#">F01C 21/102</a> ) }  |
| F01C 21/005       | .. {Internal leakage control }  |
| F01C 21/006       | .. {Equalization of pressure pulses (silencing for compressors <a href="#">F04C 29/06</a> ) }   |

- 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 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 }
- F01C 2021/00** **Component parts, details or accessories not provided for in groups [F01C 1/00](#) to [F01C 20/00](#)**
- 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   |