

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

1. 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.
2. In this subclass, the following expression is used with the meaning indicated:
  - "rotary-piston machine" includes the German expressions "Drehkolbenmaschinen", "Kreiskolbenmaschinen" and "Umlaufkolbenmaschinen".
3. 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**

F01C 11/008

(continued)

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 21/0809](#); 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 <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 <a href="#">F16, B60</a> )}
F01C 21/02	. Arrangements of bearings (bearing constructions <a href="#">F16C</a> )
F01C 21/04	. Lubrication (of machines or engines in general <a href="#">F01M</a> )
F01C 21/045	.. {Control systems for the circulation of the lubricant}
F01C 21/06	. Heating; Cooling (of machines or engines in general <a href="#">F01P</a> ); Heat insulation (heat insulation in general <a href="#">F16L</a> )
F01C 21/08	. Rotary pistons (reciprocating piston in general <a href="#">F16J</a> )
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 ( <a href="#">casings for rotary engines or machines in general F16M</a> )
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 ( <a href="#">similar arrangements for internal combustion engines F02B 33/00, F02B 27/00</a> )}
F01C 21/186	..	{for variable fluid distribution}