

# CPC COOPERATIVE PATENT CLASSIFICATION

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

### ENGINES OR PUMPS

#### F01 MACHINES OR ENGINES IN GENERAL (combustion engines [F02](#); machines for liquids [F03](#), [F04](#)); ENGINE PLANTS IN GENERAL; STEAM ENGINES

#### F01C ROTARY-PISTON OR OSCILLATING-PISTON MACHINES OR ENGINES (internal-combustion aspects [F02B 53/00](#), [F02B 55/00](#))

##### NOTES

- 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".

<p><b>1/00 Rotary-piston machines or engines (with axes of co-operating members non parallel <a href="#">F01C 3/00</a>; with the working-chamber walls at least partly resiliently deformable <a href="#">F01C 5/00</a>; with fluid ring or the like <a href="#">F01C 7/00</a>; rotary-piston machines or engines in which the working fluid is exclusively displaced by, or exclusively displaces, one or more reciprocating pistons <a href="#">F01B 13/00</a>)</b></p> <p><b>NOTE</b></p> <p>Group <a href="#">F01C 1/30</a> takes precedence over groups <a href="#">F01C 1/02</a> - <a href="#">F01C 1/28</a>.</p>	<p>1/06 . . . of other than internal-axis type (<a href="#">F01C 1/063</a> takes precedence)</p> <p>1/063 . . . with coaxially-mounted members having continuously-changing circumferential spacing between them</p> <p>1/067 . . . . having cam-and-follower type drive</p> <p>1/07 . . . . having crankshaft-and-connecting-rod type drive</p> <p>1/073 . . . . having pawl-and-ratchet type drive</p> <p>1/077 . . . . having toothed-gearing type drive</p> <p>1/08 . . . of intermeshing engagement type, i.e. with engagement of co- operating members similar to that of toothed gearing</p> <p>1/082 . . . {Details specially related to intermeshing engagement type machines or engines}</p> <p>1/084 . . . . {Toothed wheels}</p> <p>1/086 . . . . {Carter}</p> <p>1/088 . . . . {Elements in the toothed wheels or the carter for relieving the pressure of fluid imprisoned in the zones of engagement}</p> <p>1/10 . . . of internal-axis type with the outer member having more teeth or tooth-equivalents, e.g. rollers, than the inner member</p> <p>1/101 . . . . {Moineau-type}</p> <p>1/102 . . . . {with a crescent shaped filler element located between the intermeshing elements}</p> <p>1/103 . . . . {the two members rotating simultaneously around their respective axes}</p> <p>1/104 . . . . {one member having simultaneously a rotational movement about its own axis and an orbital movement}</p> <p>1/105 . . . . . {and having an articulated driving shaft}</p> <p>1/107 . . . . with helical teeth</p>
<p>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</p> <p>1/0207 . . . {both members having co-operating elements in spiral form}</p> <p>1/0215 . . . . {where only one member is moving}</p> <p>1/0223 . . . . . {with symmetrical double wraps}</p> <p>1/023 . . . . {where both members are moving}</p> <p>1/0238 . . . . . {with symmetrical double wraps}</p> <p>1/0246 . . . . {Details concerning the involute wraps or their base, e.g. geometry}</p> <p>1/0253 . . . . . {Details concerning the base}</p> <p>1/0261 . . . . . {Details of the ports, e.g. location, number, geometry}</p> <p>1/0269 . . . . . {Details concerning the involute wraps}</p> <p>1/0276 . . . . . {Different wall heights}</p> <p>1/0284 . . . . . {Details of the wrap tips}</p> <p>1/0292 . . . . . {Ports or channels located in the wrap}</p> <p>1/04 . . . of internal-axis type</p> <p>1/045 . . . . {having a C-shaped piston}</p>	

- 1/113 . . . the inner member carrying rollers intermeshing with the outer member
- 1/12 . . of other than internal-axis type
- 1/123 . . . {with tooth-like elements, extending generally radially from the rotor body cooperating with recesses in the other rotor, e.g. one tooth}
- 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}
- 1/14 . . . with toothed rotary pistons
- 1/16 . . . . with helical teeth, e.g. chevron-shaped, screw type {(for non-parallel axes of movement [F01C 3/00](#))}
- 1/165 . . . . . {having more than two rotary pistons with parallel axes}
- 1/18 . . . . with similar tooth forms ([F01C 1/16](#) takes precedence)
- 1/20 . . . . with dissimilar tooth forms ([F01C 1/16](#) takes precedence)
- 1/22 . 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
- 1/24 . of counter-engagement type, i.e. the movement of co-operating members at the points of engagement being in opposite directions
- 1/26 . . of internal-axis type
- 1/28 . . of other than internal-axis type
- 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
- 1/32 . . having both the movement defined in group [F01C 1/02](#) and relative reciprocation between the co-operating members
- 1/321 . . . {with vanes hinged to the inner member and reciprocating with respect to the inner member}
- 1/322 . . . {with vanes hinged to the outer member and reciprocating with respect to the outer member}
- 1/324 . . . with vanes hinged to the inner member and reciprocating with respect to the outer member
- 1/328 . . . . and hinged to the outer member
- 1/332 . . . with vanes hinged to the outer member and reciprocating with respect to the inner member
- 1/336 . . . . and hinged to the inner member
- 1/34 . . having the movement defined in group [F01C 1/08](#) or [F01C 1/22](#) and relative reciprocation between the co-operating members
- 1/344 . . . with vanes reciprocating with respect to the inner member
- 1/3441 . . . . {the inner and outer member being in contact along one line or continuous surface substantially parallel to the axis of rotation}
- 1/3442 . . . . . {the surfaces of the inner and outer member, forming the working space, being surfaces of revolution}
- 1/3443 . . . . . {with a separation element located between the inlet and outlet opening}
- 1/3445 . . . . . {the vanes having the form of rollers, slippers or the like}
- 1/3446 . . . . . {the inner and outer member being in contact along more than one line or surface}
- 1/3447 . . . . . {the vanes having the form of rollers, slippers or the like}
- 1/3448 . . . . . {with axially movable vanes}
- 1/348 . . . . the vanes positively engaging, with circumferential play, an outer rotatable member
- 1/352 . . . . the vanes being pivoted on the axis of the outer member
- 1/356 . . . with vanes reciprocating with respect to the outer member
- 1/3562 . . . . . {the inner and outer member being in contact along one line or continuous surface substantially parallel to the axis of rotation}
- 1/3564 . . . . . {the surfaces of the inner and outer member, forming the working space, being surfaces of revolution}
- 1/3566 . . . . {the inner and outer member being in contact along more than one line or surface}
- 1/3568 . . . . . {with axially movable vanes}
- 1/36 . . having both the movements defined in sub-groups [F01C 1/22](#) and [F01C 1/24](#)
- 1/38 . . having the movement defined in group [F01C 1/02](#) and having a hinged member ([F01C 1/32](#) takes precedence)
- 1/39 . . . with vanes hinged to the inner as well as to the outer member
- 1/40 . . having the movement defined in group [F01C 1/08](#) or [F01C 1/22](#) and having a hinged member
- 1/44 . . . with vanes hinged to the inner member
- 1/46 . . . with vanes hinged to the outer member
- 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](#))**
- 3/02 . the axes being arranged at an angle of 90 degrees
- 3/025 . . {of intermeshing engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing}
- 3/04 . . with axially sliding vanes
- 3/06 . the axes being arranged otherwise than at an angle of 90 degrees
- 3/08 . . of intermeshing-engagement type, i.e. with engagement of co-operating members similar to that of toothed gearing
- 3/085 . . . {the axes of cooperating members being on the same plane}
- 5/00 Rotary-piston machines or engines with the working-chamber walls at least partly resiliently deformable**
- 5/02 . the resiliently-deformable wall being part of the inner member, e.g. of a rotary piston
- 5/04 . the resiliently-deformable wall being part of the outer member, e.g. of a housing
- 5/06 . the resiliently-deformable wall being a separate member
- 5/08 . . of tubular form, e.g. hose
- 7/00 Rotary-piston machines or engines with fluid ring or the like**
- 9/00 Oscillating-piston machines or engines**
- 9/002 . {the piston oscillating around a fixed axis}

9/005	<ul style="list-style-type: none"> <li>{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 <a href="#">F01C 3/00</a>)}</li> </ul>	20/00	<b>Control of, monitoring of, or safety arrangements for, machines or engines</b>
9/007	<ul style="list-style-type: none"> <li>{the points of the moving element describing approximately an alternating movement in axial direction with respect to the other element}</li> </ul>	20/02	<ul style="list-style-type: none"> <li>specially adapted for several machines or engines connected in series or in parallel</li> </ul>
<b>11/00</b>	<b>Combinations of two or more machines or engines, each being of rotary-piston or oscillating-piston type (<a href="#">F01C 13/00</a> takes precedence; combinations of two or more pumps <a href="#">F04</a>; fluid gearing <a href="#">F16H</a>)</b>	20/04	<ul style="list-style-type: none"> <li>specially adapted for reversible machines or engines</li> </ul>
11/002	<ul style="list-style-type: none"> <li>{of similar working principle}</li> </ul>	20/06	<ul style="list-style-type: none"> <li>specially adapted for stopping, starting, idling or no-load operation</li> </ul>
11/004	<ul style="list-style-type: none"> <li>. . {and of complementary function, e.g. internal combustion engine with supercharger}</li> </ul>	20/08	<ul style="list-style-type: none"> <li>characterised by varying the rotational speed</li> </ul>
11/006	<ul style="list-style-type: none"> <li>{of dissimilar working principle}</li> </ul>	20/10	<ul style="list-style-type: none"> <li>characterised by changing the positions of the inlet or outlet openings with respect to the working chamber</li> </ul>
11/008	<ul style="list-style-type: none"> <li>. . {and of complementary function, e.g. internal combustion engine with supercharger}</li> </ul>	20/12	<ul style="list-style-type: none"> <li>. . using sliding valves</li> </ul>
	<b>NOTE</b>	20/125	<ul style="list-style-type: none"> <li>. . . {with sliding valves controlled by the use of fluid other than the working fluid}</li> </ul>
	Multi-stage steam engines or similar machines are not considered as having complementary function	20/14	<ul style="list-style-type: none"> <li>. . using rotating valves</li> </ul>
<b>13/00</b>	<b>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)</b>	20/16	<ul style="list-style-type: none"> <li>. . using lift valves</li> </ul>
13/02	<ul style="list-style-type: none"> <li>for driving hand-held tools or the like</li> </ul>	20/18	<ul style="list-style-type: none"> <li>characterised by varying the volume of the working chamber (by changing the positions of inlet or outlet openings <a href="#">F01C 20/10</a>)</li> </ul>
13/04	<ul style="list-style-type: none"> <li>for driving pumps or compressors</li> </ul>	20/185	<ul style="list-style-type: none"> <li>. . {by varying the useful pumping length of the cooperating members in the axial direction}</li> </ul>
<b>17/00</b>	<b>Arrangements for drive of co-operating members, e.g. for rotary piston and casing</b>	20/20	<ul style="list-style-type: none"> <li>. . by changing the form of the inner or outlet contour of the working chamber</li> </ul>
17/02	<ul style="list-style-type: none"> <li>of toothed-gearing type (<a href="#">F01C 1/077</a> takes precedence)</li> </ul>	20/22	<ul style="list-style-type: none"> <li>. . by changing the eccentricity between cooperating members</li> </ul>
17/04	<ul style="list-style-type: none"> <li>of cam-and-follower type (<a href="#">F01C 1/067</a> takes precedence)</li> </ul>	20/24	<ul style="list-style-type: none"> <li>characterised by using valves for controlling pressure or flow rate, e.g. discharge valves (<a href="#">F01C 20/10</a> takes precedence)</li> </ul>
17/06	<ul style="list-style-type: none"> <li>using cranks, universal joints or similar elements (<a href="#">F01C 1/07</a> takes precedence)</li> </ul>	20/26	<ul style="list-style-type: none"> <li>. . using bypass channels</li> </ul>
17/063	<ul style="list-style-type: none"> <li>. . {with only rolling movement}</li> </ul>	20/265	<ul style="list-style-type: none"> <li>. . . {being obtained by displacing a lateral sealing face}</li> </ul>
17/066	<ul style="list-style-type: none"> <li>. . {with an intermediate piece sliding along perpendicular axes, e.g. Oldham coupling}</li> </ul>	20/28	<ul style="list-style-type: none"> <li>Safety arrangements; Monitoring</li> </ul>
<b>19/00</b>	<b>Sealing arrangements in rotary-piston machines or engines (sealings in general <a href="#">F16J</a>)</b>	<b>21/00</b>	<b>Component parts, details or accessories not provided for in groups <a href="#">F01C 1/00</a> - <a href="#">F01C 20/00</a></b>
19/005	<ul style="list-style-type: none"> <li>{Structure and composition of sealing elements such as sealing strips, sealing rings and the like; Coating of these elements (vane construction <a href="#">F01C 21/0809</a>; piston rings and ring sealings of similar construction in general <a href="#">F16J 9/00</a>)}</li> </ul>	21/001	<ul style="list-style-type: none"> <li>{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>)}</li> </ul>
19/02	<ul style="list-style-type: none"> <li>Radially-movable sealings for working fluids</li> </ul>	21/002	<ul style="list-style-type: none"> <li>. . {with control systems for the injection of the fluid}</li> </ul>
19/025	<ul style="list-style-type: none"> <li>. . {Radial sealing elements specially adapted for intermeshing engagement type machines or engines, e.g. gear machines or engines}</li> </ul>	21/003	<ul style="list-style-type: none"> <li>{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>)}</li> </ul>
19/04	<ul style="list-style-type: none"> <li>. . of rigid material</li> </ul>	21/005	<ul style="list-style-type: none"> <li>. . {Internal leakage control}</li> </ul>
19/06	<ul style="list-style-type: none"> <li>. . of resilient material</li> </ul>	21/006	<ul style="list-style-type: none"> <li>. . {Equalization of pressure pulses (silencing for compressors <a href="#">F04C 29/06</a>)}</li> </ul>
19/08	<ul style="list-style-type: none"> <li>Axially-movable sealings for working fluids</li> </ul>	21/007	<ul style="list-style-type: none"> <li>{General arrangements of parts; Frames and supporting elements}</li> </ul>
19/085	<ul style="list-style-type: none"> <li>. . {Elements specially adapted for sealing of the lateral faces of intermeshing-engagement type machines or engines, e.g. gear machines or engines}</li> </ul>	21/008	<ul style="list-style-type: none"> <li>{Driving elements, brakes, couplings, transmissions specially adapted for rotary or oscillating-piston machines or engines (brakes, couplings, transmissions per se <a href="#">F16</a>, <a href="#">B60</a>)}</li> </ul>
19/10	<ul style="list-style-type: none"> <li>Sealings for working fluids between radially and axially movable parts</li> </ul>	21/02	<ul style="list-style-type: none"> <li>Arrangements of bearings (bearing constructions <a href="#">F16C</a>)</li> </ul>
19/12	<ul style="list-style-type: none"> <li>for other than working fluid</li> </ul>	21/04	<ul style="list-style-type: none"> <li>Lubrication (of machines or engines in general <a href="#">F01M</a>)</li> </ul>
19/125	<ul style="list-style-type: none"> <li>. . {Shaft sealings specially adapted for rotary or oscillating-piston machines or engines}</li> </ul>	21/045	<ul style="list-style-type: none"> <li>. . {Control systems for the circulation of the lubricant}</li> </ul>
		21/06	<ul style="list-style-type: none"> <li>Heating; Cooling (of machines or engines in general <a href="#">F01P</a>); Heat insulation (heat insulation in general <a href="#">F16L</a>)</li> </ul>

- 21/08 . Rotary pistons ([reciprocating pistons in general F16J](#))
- 21/0809 . . {Construction of vanes or vane holders}
- 21/0818 . . . {Vane tracking; control therefor}
- 21/0827 . . . . {by mechanical means}
- 21/0836 . . . . . {comprising guiding means, e.g. cams, rollers}
- 21/0845 . . . . . {comprising elastic means, e.g. springs}
- 21/0854 . . . . {by fluid means}
- 21/0863 . . . . . {the fluid being the working fluid}
- 21/0872 . . . . . {the fluid being other than the working fluid}
- 21/0881 . . . {the vanes consisting of two or more parts}
- 21/089 . . . {for synchronised movement of the vanes}
- 21/10 . Outer members for co-operation with rotary pistons; Casings ([casings for rotary engines or machines in general F16M](#))
- 21/102 . . {Adjustment of the interstices between moving and fixed parts of the machine by means other than fluid pressure}
- 21/104 . . {Stators; Members defining the outer boundaries of the working chamber}
- 21/106 . . . {with a radial surface, e.g. cam rings}
- 21/108 . . . {with an axial surface, e.g. side plates}
- 2021/12 . {Control of working fluid admission or discharge}
- 2021/125 . . {Arrangements for supercharging the working space}
- 2021/14 . . {for variable fluid distribution}
- 2021/16 . {Other regulation or control}
- 2021/1606 . . {Variation of the working chamber}
- 2021/1612 . . . {by changing the eccentricity of an element with respect to another element}
- 2021/1618 . . . {by changing the positions of the inlet and outlet openings with respect to the working chambers}
- 2021/1625 . . . . {with sliding or rotating valves, adjustable in position}
- 2021/1631 . . . . . {with sliding valves controlled by the use of fluid other than the working fluid}
- 2021/1637 . . . {by changing the form of the radially inner or the radially outer contour of the working chamber}
- 2021/1643 . . {by using valves regulating pressure and flow rate, e.g. discharge valves}
- 2021/165 . . . {using a by-pass channel}
- 2021/1656 . . . . {being obtained by displacing a lateral sealing face}
- 2021/1662 . . . {with venting means}
- 2021/1668 . . {with several machines or engines connected in series or in parallel}
- 2021/1675 . . {with reversible machines or engines}
- 2021/1681 . . {by varying the rotational speed}
- 2021/1687 . . {Safety arrangements}
- 2021/1693 . . {Stopping or starting, idling or no-load operation}
- 21/18 . Arrangements for admission or discharge of the working fluid, e.g. constructional features of the inlet or outlet
- 21/183 . . {Arrangements for supercharging the working space ([similar arrangements for internal combustion engines F02B 33/00, F02B 27/00](#))}
- 21/186 . . {for variable fluid distribution}