CPC COOPERATIVE PATENT CLASSIFICATION

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

ENGINES OR PUMPS

F01 MACHINES OR ENGINES IN GENERAL; 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

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".

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

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 - F01C 1/28.

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

1/0207 . . {both members having co-operating elements in spiral form}

1/0215 . . . {where only one member is moving}

1/0223 . . . . {with symmetrical double wraps}

1/023 . . . {where both members are moving}

1/0238 . . . . {with symmetrical double wraps}

1/0246 . . . {Details concerning the involute wraps or their base, e.g. geometry}

1/0253 . . . . {Details concerning the base}

1/0261 . . . . . {Details of the ports, e.g. location, number, geometry}

1/0269 . . . . {Details concerning the involute wraps}

1/0276 . . . . . {Different wall heights}

1/0284 . . . . . {Details of the wrap tips}

1/0292 . . . . . {Ports or channels located in the wrap}

1/04 . . of internal-axis type

1/045 . . . {having a C-shaped piston}

1/06 . . of other than internal-axis type (F01C 1/063 takes precedence)

1/063 . . with coaxially-mounted members having continuously-changing circumferential spacing between them

1/067 . . . having cam-and-follower type drive

1/07 . . . having crankshaft-and-connecting-rod type drive

1/073 . . . having pawl-and-ratchet type drive

1/077 . . . having toothed-gearing type drive

1/08 . of intermeshing engagement type, i.e. with engagement of co- operating members similar to that of toothed gearing

1/082 . . {Details specially related to intermeshing engagement type machines or engines}

1/084 . . . {Toothed wheels}

1/086 . . . {Carter}

1/088 . . . {Elements in the toothed wheels or the carter for relieving the pressure of fluid imprisoned in the zones of engagement}

1/10 . . of internal-axis type with the outer member having more teeth or tooth-equivalents, e.g. rollers, than the inner member

1/101 . . . {Moineau-type}

1/102 . . . {with a crescent shaped filler element located between the intermeshing elements}

1/103 . . . {the two members rotating simultaneously around their respective axes}
1/104 . . . {one member having simultaneously a rotational movement about its own axis and an orbital movement}
1/105 . . . . {and having an articulated driving shaft}
1/107 . . . with helical teeth
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 . {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)}

9/007 . {the points of the moving element describing approximately an alternating movement in axial direction with respect to the other element}

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)

11/002 . {of similar working principle}

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

11/006 . {of dissimilar working principle}

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

13/00 Adaptations of machines or engines for special use; Combinations of engines with devices driven thereby

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

13/04 . for driving pumps or compressors

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

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

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

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

17/063 . . {with only rolling movement}

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

19/00 Sealing arrangements in rotary-piston machines or engines (sealings in general F16J)

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)}

19/02 . Radially-movable sealings for working fluids

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

19/04 . . of rigid material

19/06 . . of resilient material

19/08 . Axially-movable sealings for working fluids

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

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

19/12 . for other than working fluid

19/125 . . {Shaft sealings specially adapted for rotary or oscillating-piston machines or engines}

20/00 Control of, monitoring of, or safety arrangements for, machines or engines

20/02 . specially adapted for several machines or engines connected in series or in parallel

20/04 . specially adapted for reversible machines or engines

20/06 . specially adapted for stopping, starting, idling or no-load operation

20/08 . characterised by varying the rotational speed

20/10 . characterised by changing the positions of the inlet or outlet openings with respect to the working chamber

20/12 . . using sliding valves

20/125 . . . {with sliding valves controlled by the use of fluid other than the working fluid}

20/14 . . using rotating valves

20/16 . . using lift valves

20/18 . characterised by varying the volume of the working chamber (by changing the positions of inlet or outlet openings F01C 20/10)

20/185 . . {by varying the useful pumping length of the cooperating members in the axial direction}

20/20 . . by changing the form of the inner or outlet contour of the working chamber

20/22 . . by changing the eccentricity between cooperating members

20/24 . characterised by using valves for controlling pressure or flow rate, e.g. discharge valves (F01C 20/10 takes precedence)

20/26 . . using bypass channels

20/265 . . . {being obtained by displacing a lateral sealing face}

20/28 . Safety arrangements; Monitoring

21/00 Component parts, details or accessories not provided for in groups F01C 1/00 - F01C 20/00

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)}

21/002 . . {with control systems for the injection of the fluid}

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)}

21/005 . . {Internal leakage control}

21/006 . . {Equalization of pressure pulses (silencing for compressors F04C 29/06)}

21/007 . {General arrangements of parts; Frames and supporting elements}

21/008 . {Driving elements, brakes, couplings, transmissions specially adapted for rotary or oscillating-piston machines or engines (brakes, couplings, transmissions per se F16, B60)}

21/02 . Arrangements of bearings (bearing constructions F16C)
21/04 . Lubrication (of machines or engines in general F01M)
21/045 . . {Control systems for the circulation of the lubricant}
21/06 . Heating; Cooling (of machines or engines in general F01P); Heat insulation (heat insulation in general F16L)
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}