CPC  COOPERATIVE PATENT CLASSIFICATION

MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING

ENGINES OR PUMPS

MACHINES OR ENGINES IN GENERAL; ENGINE PLANTS IN GENERAL; STEAM ENGINES

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 5/00)}
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 . . . [with a separation element located between the working-chamber walls]
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
Sealing arrangements in rotary-piston machines or engines with fluid rings or the like

Oscillating-piston machines or engines

{ (the piston oscillating around a fixed axis)

{ (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)}

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

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)

{ (of similar working principle)

{ (of dissimilar working principle)

{ (of complementary function, e.g. internal combustion engine with supercharger)

{ (of different function, e.g. internal combustion engine with supercharger)

NOTE

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

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)

{ for driving hand-held tools or the like

{ for driving pumps or compressors

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

{ of toothed-gearing type (F01C 1A/077 takes precedence)

{ of cam-and-follower type (F01C 1/067 takes precedence)

{ using cranks, universal joints or similar elements (F01C 1/077 takes precedence)

{ (with only rolling movement)

{ (with an intermediate piece sliding along perpendicular axes, e.g. Oldham coupling)

Sealing arrangements in rotary-piston machines or engines (sealings in general F16)

{ (Structure and composition of sealing elements such as sealing strips, sealing rings and the like; Coating of these elements (vane construction F01C 21A/080; piston rings and ring sealings of similar construction in general F16J 9/00))

{ Radially movable sealings for working fluids

{ of rigid material

{ of resilient material

Axially-movable sealings for working fluids

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

Sealings for working fluids between radially and axially movable parts

for other than working fluid

Shaft sealings specially adapted for rotary or oscillating-piston machines or engines

Control of, monitoring of, or safety arrangements for, machines or engines

{ specially adapted for several machines or engines connected in series or in parallel

{ specially adapted for reversible machines or engines

{ specially adapted for stopping, starting, idling or no-load operation

{ characterised by varying the rotational speed

{ characterised by changing the positions of the inlet or outlet openings with respect to the working chamber

{ using sliding valves

{ (with sliding valves controlled by the use of fluid other than the working fluid)

{ using rotating valves

{ using lift valves

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

{ (by varying the useful pumping length of the cooperating members in the axial direction)

{ by changing the form of the inner or outlet contour of the working chamber

{ by changing the eccentricity between cooperating members

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

{ using bypass channels

{ (being obtained by displacing a lateral sealing face)

Safety arrangements; Monitoring

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

{ (Injection of a fluid in the working chamber for sealing, cooling and lubricating (sealing only F01C 1/00; 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))

{ (with control systems for the injection of the fluid)

{ (Systems for the equilibration of forces acting on the elements of the machine (interstice adjustment other than by fluid pressure F01C 21/02))

{ (Internal leakage control)

{ (Equalization of pressure pulses (silencing for compressors F04C 29/06))

{ (General arrangements of parts; Frames and supporting elements)

{ (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]