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}
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
7/00  Rotary-piston machines or engines with fluid ring or the like

9/00  Oscillating-piston machines or engines

9/00/02  (the piston oscillating around a fixed axis)
9/00/05  (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))
9/00/07  (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))
11/00/02  (of similar working principle)
11/00/04  (of complementary function, e.g. internal combustion engine with supercharger)
11/00/06  (of dissimilar working principle)
11/00/08  (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 (aspects predominantly concerning driven devices, see the relevant classes for these devices)
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 1/077 takes precedence)
17/06/03  (with only rolling movement)
17/06/06  (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 (F16))
19/00/05  (Structure and composition of sealing elements such as sealing strips, sealing rings and the like; Coating of these elements (vane construction (F01C 21/008; piston rings and ring sealings of similar construction in general (F16 900)))
19/02  Radially-movable sealings for working fluids
19/02/25  (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 21/02))
21/005  (Internal leakage control)
21/006  (Equalization of pressure pulses (silencing for compressors (F01C 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]
2021/106 . . . . [Control of working fluid admission or discharge]
2021/12 . . . . [Arrangements for supercharging the working space]
2021/125 . . . . . [for variable fluid distribution]
2021/14 . . . . [Other regulation or control]
2021/16 . . . . . [Variation of the working chamber]
2021/1606 . . . . . [by changing the eccentricity of an element with respect to another element]
2021/1612 . . . . . [by changing the form of the radially inner or the radially outer contour of the working chamber]
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]
2021/1662 . . . . . [being obtained by displacing a lateral sealing face]
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]