CPC  COOPERATIVE PATENT CLASSIFICATION

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

ENGINEERING IN GENERAL

F16  ENGINEERING ELEMENTS AND UNITS; GENERAL MEASURES FOR PRODUCING AND MAINTAINING EFFECTIVE FUNCTIONING OF MACHINES OR INSTALLATIONS; THERMAL INSULATION IN GENERAL

F16J  PISTONS {{(specially adapted for dampers F16F 9/32)}; CYLINDERS; SEALINGS

NOTE

Attention is drawn to the following places:
A47J 27/08  Pressure cookers
E04B 1/68  Sealing building joints
E05C 9/00  Multi-point fastening of wings in general
F01B  Machines or engines in general or of reciprocating type, e.g. cylinders peculiar to steam engines
F01B 31/28
F02F 1/00  Cylinders for combustion engines
F02F 3/00  Pistons for combustion engines
F04D 29/08  Sealings of non-positive displacement pumps
F17B 1/04  Sealing devices for sliding parts of gas holders of variable capacity
F28F 9/04  Arrangements for sealing elements into header boxes or end plates of heat-exchangers.

WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
   F16J 15/53  covered by  F16J 15/43

2. 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  Pistons; Trunk pistons; Plungers (bellows pistons F16J 3/06; piston-rings or seats therefore F16J 9/00; [manufacture of pistons B23P 15/10]; rotary pistons, e.g. for "Wankel" type engines F01C; specific for combustion engines, i.e. constructed to withstand high temperature or modified for guiding, igniting, vaporising or otherwise treating the charge F02E; [pistons for hydraulic engines F03C]; pumps F04B; floats F16K 33/00)

   1/01  . . . {One-piece pistons}
   1/03  . . . {with integral sealing lips}
   1/05  . . . {obtained by assembling several pieces}
   1/06  . . . {of different materials}
   1/08  . . . . . . {with sealing lips}
   1/01  . . characterised by the use of particular materials (F16J 1/02 takes precedence)
   1/02  . . Bearing surfaces
   1/04  . . Resilient guiding parts, e.g. skirts, particularly for trunk pistons
   1/06  . . . with separate expansion members; Expansion members
   1/08  . . . Constructional features providing for lubrication
   1/09  . . . with means for guiding fluids (F16J 1/08 takes precedence)
   1/10  . . Connection to driving members
   1/12  . . . with piston-rods, e.g. rigid connections

   1/14  . . . with connecting-rods, i.e. pivotal connections
   1/16  . . . with gudgeon-pin; Gudgeon-pins
   1/18  . . . . Securing of gudgeon-pins
   1/20  . . . with rolling contact, other than in ball or roller bearings
   1/22  . . . with universal joint, e.g. ball-joint
   1/24  . . designed to give the piston some rotary movement about its axis

3/00  Diaphragms; Bellows; Bellows pistons (connection of valves to inflatable elastic bodies B60C 29/00; bellows or the like used in instruments G12B 1/04; diaphragms for electromechanical transducers H04R 7/00)

   3/02  . . Diaphragms
   3/04  . . Bellows
   3/04  . . . {Non-metallic bellows]
   3/04  . . . {Fastening details]
   3/04  . . . {with particular means for limiting wear]
   3/04  . . . {Split bellows]
   3/04  . . . {Lubrication or venting arrangements]
   3/04  . . . {Metallic bellows]
   3/04  . . . {with guiding or supporting means]
   3/06  . . Bellows pistons

7/00  Piston-rods
relevant subclasses, e.g. B01J

Pressure vessels in general, G21C; for particular applications, see the appropriate subclasses, e.g. F17C.

Cylindrical bodies in general for combustion engines F02F of particular kinds, see F16J 12/00.

Engine or like cylinders (pressure vessels in general F16J 12/00; cylinders for engines or other apparatus of particular kinds, see the appropriate subclasses, e.g. for combustion engines F02D; Features of hollow, e.g. cylindrical, bodies in general)

Cylinders designed to receive moving pistons or plungers

Running faces; Liners

Pressure vessels in general (covers therefor F16J 13/00; for particular applications, see the relevant subclasses, e.g. B01J, F17C, G21C)

Covers or similar closure members for pressure vessels in general (for engines or like cylinders F16J 10/00; sealings F16J 15/02; covers for box-like containers B65D 43/00; devices for securing or retaining closure members B65D 45/00; closures for containers not otherwise provided for B65D 51/00; manholes, covers for large containers B65D 90/10; gates or closures for large containers B65D 90/14; for vessels for containing or storing compressed, liquefied or solidified gases F17C 13/06; steam boilers F22B)

Detachable closure members; Means for tightening closures (F16J 13/16, F16J 13/22 take precedence)

attached with a bridge member

attached only by clamps along the circumference

the clamp comprising a ring encircling the flange

attached by one or more members actuated to project behind a part or parts of the frame (similar constructions for doors or windows F05C 9/00)

attached by means of a divided ring

attached by wedging action by means of screw-thread, interrupted screw-thread, bayonet closure, or the like

attached exclusively by spring action or elastic action

Pivoted closures (F16J 13/22 takes precedence)

pivoted directly on the frame

mounted by mobile fastening on swinging arms

with movement parallel to the plane of the opening

with safety devices, e.g. to prevent opening prior to pressure release

Sealings

comprising at least two sealings in succession (F16J 15/16, F16J 15/40 take precedence)

forming of recuperation chamber for the leaking fluid

with division of the pressure (F16J 15/44 takes precedence)

with provision to put out of action at least one sealing; One sealing only on standstill; Emergency or servicing sealings (F16J 15/164 takes precedence)

between relatively-stationary surfaces (F16J 15/46, F16J 15/48 take precedence)

with elastic packing (F16J 15/08 takes precedence)

characterised by structure or material

the packing being locally weakened in order to increase elasticity

and with at least one flexible lip

and with a hollow profile

the packing being mechanically expanded against the sealing surface

without packing between the surfaces, e.g. with ground surfaces, with cutting edge

with solid packing compressed between sealing surfaces

with positioning means (F16J 15/0831 takes precedence)

characterised by the geometry of the seat

the packing combining the sealing function with other functions

Piston-rings, e.g. non-metallic piston-rings), seats therefor; Ring sealings of similar construction (other sealings between pistons and cylinders F16J 3/06, F16J 15/16; manufacture of piston-rings B23P 15/06, B23P 15/08); tools for mounting or removing piston-rings or the like B25B; piston sealing arrangements on brake master cylinders B60T 11/236; sealing provided on pump pistons F04B 53/143)

L-section rings

Helical rings

using separate springs [or elastic elements] expanding the rings; Springs therefor [Expansion by wedging]

usin metallic coiled or blade springs (F16J 9/145 takes precedence)

Coiled spring along the entire circumference

Strip or wire along the entire circumference

Rings with a flat annular side rail

Spring expander with massive cross-section

Spring expander from sheet metal

corrugated in the radial direction

corrugated in the axial direction

with "C"-shaped cross section along the entire circumference

with expansion obtained by pressure of the medium

Special members for adjusting the rings

Details

Joint-closures

of spring expanders

obtained by stacking of rings

with separate bridge-elements

Rings with special cross-section (L-section rings F16J 9/02); Oil-scraping rings ((F16J 9/06 takes precedence)

Oil-scraping rings

WARNING

The group F16J 9/203 is no longer used for the classification of new documents from August 1st, 2002. The backlog of this group is being continuously reclassified to F16J 9/206, and to F16J 9/06 and subgroups.

One-piece oil-scraping rings

Rings for preventing wear of grooves or like sealings

Members preventing rotation of rings in grooves

characterised by the use of particular materials

of non-metals
construction F16J 9/00
F16J 3/06
F16J 15/52
; piston-rings or ring sealings of similar
material or surface treatment
with a braided or knitted body
[Flat gaskets]
[laminated]
{with mounting aids}
[with an edge portion folded over a second
plate or shim]
[with an edge portion folded over the plate
itself]
[without fold over]
[with a non-metallic coating or strip]
[with a bore ring]
{Aspects not related to the edges of the
packing}
[with lubricating, cooling or draining means]
with stuffing-boxes for rigid sealing rings
with stuffing-boxes for elastic or plastic packings
which permits material to be continuously
conveyed
{Means for facilitating the removal of the
packing}
{Self-aligning stuffing-boxes}
[Splitted assemblies]
[Means for facilitating the removal of the
packing]
Packaging materials therefor
shaped as strands, ropes, threads, ribbons, or
the like
with radially or tangentially compressed
packing
with stuffing-boxes for rigid sealing rings
with sealing rings made of metal
with sealing rings made of carbon
with elastic sealings, e.g. O-rings
with at least one lip
provided with tension elements, e.g. elastic
rings
with metal springs
supported in a direction parallel to the
surfaces
supported in a direction perpendicular to the
surfaces
capable of accommodating changes in
distances or misalignment between the
surfaces, e.g. able to compensate for defaults
of eccentricity or angular deviations
formed by deforming a flat ring
having two or more lips
with at least one lip for each surface, e.g.
U-cup packings
Arrangements for lubrication or cooling of the
sealing itself
with hydrodynamic pumping action
provided with casings or supports
with rigid casings or supports
comprising two casing or support
elements, one attached to each surface, e.g.
cartridge or cassette seals
with means for detecting or measuring
relative rotation of the two elements
the elements being separable from each
other
Mounting of sealing rings
the rings having a break or opening, e.g. to
enable mounting on a shaft otherwise than
from a shaft end
with additional static sealing between the
sealing, or its casing or support, and the
surface on which it is mounted
Manufacturing methods specially adapted for
elastic sealings (moulding B29C)
characterised by their structure; Selection of
materials
Filamentary structures, e.g. brush seals
Lamellar structures
Arrangements for monitoring the condition or operation of elastic sealings (F16J 15/326 takes precedence); Arrangements for control of elastic sealings, e.g. of their geometry or stiffness

with slip-ring pressed against a more or less radial face on one member

{ and characterised by parts or details relating to lubrication, cooling or venting of the seal }

{ with cavities (F16J 15/3424 takes precedence) }

{ with at least one continuous groove }

{ with means for feeding fluid directly to the face }

{ with microcavities }

{ with a wavy surface }

{ the geometry of the surface being able to vary during operation }

{ Pressing means }

{ the pressing force being applied by means of an elastic ring supporting the slip-ring }

{ by magnetic attraction }

{ the pressing force resulting from fluid pressure }

{ the pressing force resulting from the action of a spring }

{ without external means for pressing the ring against the face, e.g. slip-ring with a resilient lip }

{ the pressing force varying during operation }

{ Mounting of the seal }

{ Means for controlling the deformations of the contacting faces }

{ Means for centering or aligning the contacting faces }

{ Means for minimising vibrations of the slip-ring }

{ Pre-assembled seals, e.g. cartridge seals }

{ Tandem seals }

{ Split-rings }

{ with monitoring or measuring means associated with the seal }

{ use of special materials }

connected by a diaphragm [or bellow] to the other member

{ the diaphragm or bellow being made of metal }

{ and comprising vibration-damping means }

sealed by a packing

by means of fluid

by changing the state of matter

by at least one pump

kept in sealing position by centrifugal force

kept in sealing position by magnetic force

Free-space packings

{ with floating ring }

{ segmented }

{ provided with discharge channels }

{ with facing materials having honeycomb-like structure }

with packing ring expanded or pressed into place by fluid pressure, e.g. inflatable packings (connection of valves to inflatable elastic bodies B60C 29/00; for sealing arrangements in vehicles B60J 10/244; for sealing arrangements of openings in buildings E06B 7/2318; for tube connections F16L)

between relatively-movable members, by means of a sealing without relatively-moving surfaces, e.g. fluid-tight sealings for transmitting motion through a wall

by means of sealing bellows or diaphragms (connection of valves to inflatable elastic bodies B60C 29/00)

{ fixed to a part of a transmission performing a wobbling or a circular translatory movement }

Other sealings for rotating shafts

Other sealings for reciprocating rods

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