CLASS 277 SEAL FOR A JOINT OR JUNCTURE

PROCESS OF DYNAMIC SEALING
300
301 . Close proximity seal (e.g., contactless, fluent, etc.)
302 . Magnetic
303 . Labyrinth
304 . Formed by pressurized sealing fluid introduced to form barrier
305 . Floating ring or bushing
306 . Relatively rotatable radially extending sealing face member (e.g., face, mechanical, etc.)
307 . Formed by flexible projection
308 . Contained or compressed by gland member in packing box
309 . Peripheral radially sealing flexible projection (e.g., lip, piston cup seal, etc.)
310 . Piston ring for internal combustion engine
311 . Flexible ring

PROCESS OF STATIC SEALING
312
313 . Between parts of internal combustion engine
314 . Pipe, conduit, or cable
315 . Using flexible sleeve, boot, or diaphragm
316 . Forming in place (i.e., in situ)

SEAL COMBINED WITH INDICATOR, SAMPLER, OR INSPECTION FEATURE
318
319 . Fluid pressure
320 . Fluid temperature
321 . Fluid leakage
322 . Wear, proper seating, or presence

SEAL FOR WELL APPARATUS
323
324 . For overpressure control device (e.g., seal for a blowout preventer, etc.)
325 . Segmented radially actuated (e.g., ram type, etc.)
326 . Rotatable
327 . Axially compressed ring
328 . Longitudinally actuated packer for above ground apparatus
329 . Contained or compressed by gland member in packing box
330 . For line or cable
331 . Inflatable packer
332 . Deforms radially inward
333 . And inflating medium control
334 . Particular wall structure
335 . Axially facing packing cup
336 . For below ground apparatus
337 . Longitudinally actuated packer
338 . Packing sleeve
339 . Expanded by wedging member
340 . Particular wall structure
341 . Reinforcing feature
342 . Plural stacked rings
343 . Seal (e.g., wiper, oil saver, stripper, etc.) accommodates irregular size of inner part
344 . Segmented radially actuated packer (e.g., oil saver, gas saver, etc.) for above ground apparatus

SEAL BETWEEN RELATIVELY MOVABLE PARTS (I.E., DYNAMIC SEAL)
345
346 . Diverse and distinct dynamic seals
347 . Close proximity seal (e.g., contactless, fluent, etc.)
348 . And relatively rotatable radially extending contacting sealing members (e.g., face, mechanical, etc.)
349 . And circumferential peripheral radially sealing flexible projection (e.g., lip seal, etc.)
350 . And circumferential contact seal
351 . Peripheral radially sealing flexible projection (e.g., lip seal, etc.)
352 . Relatively rotatable radially extending contacting sealing members (e.g., face, mechanical, etc.)
353 . And circumferential peripheral radially sealing flexible projection (e.g., lip seal, etc.)
354 . Helically threaded part
355 . Brush seal
356 . For journal box (e.g., railway car journal, etc.)
357 . For rotary piston
358 . Relatively rotatable radially extending sealing face member (e.g., face, mechanical, etc.)
359 . Temperature responsive feature
360 . Accommodates or prevents thermal distortion
CLASS 277 SEAL FOR A JOINT OR JUNCTURE

361 Multiple sealing faces (e.g., double seals, etc.)
362 Floating intermediate sealing face member
363 Including an outwardly axial biasing member
364 Concentric and radially spaced
365 Three or more
366 Shaft mounted sealing face members biased axially away from each other
367 Shaft mounted sealing face members biased axially towards each other
368 Housing mounted sealing face members biased axially away from each other
369 Housing mounted sealing face members biased axially towards each other
370 Installation, removal, assembly, disassembly, or repair feature
371 Unitized seal assembly (e.g., cartridge, etc.)
372 Having rotation prevention (i.e., antirotation) feature for the sealing face member
373 Lug or rib
374 Retains opposed sealing face members
375 Mounted in housing or casing
376 Snap fit into groove
377 Particular axial biasing feature
378 Magnetic
379 Particular spring feature
380 Made of elastomeric material
381 Frustoconical shape
382 O-ring shape
383 Imbedded in another material
384 Washerlike shape
385 Arrangement or location
386 Radially biasing member creates axial bias
387 Fluid pressure
388 Creates counter pressure
389 And bellows or diaphragm
390 Particular secondary mounting seal or driving connection
391 Flexible sleeve, boot, or diaphragm
392 Between sealing face member and shaft or part relating to shaft
393 Particular connecting feature to sealing face member
394 Peripheral radially sealing flexible projection (e.g., lip seal, etc.)
395 U- or V-shaped cross-sectional profile
396 Axially compressed packing
397 Frictionally engaged or interfitting projection and recess
398 Eccentric, gyratory, or oscillatory motion
399 Particular sealing face member configuration
400 Hydrodynamic feature
401 Fluid passage to the sealing face
402 Flexible projection (e.g., lip seal, etc.)
403 Angled or tapered sealing face
404 Made of particular material
405 Ceramic
406 Metal
407 Elastomeric or plastic
408 Introduction, circulation, or removal of fluid
409 Close proximity seal (e.g., contactless, fluent, etc.)
410 Magnetic
411 Gap or clearance
412 Labyrinth
413 Having adjustable member
414 Formed by cellular pockets (e.g., honeycomb, etc.)
415 Having wear resistant, abradable, or ablative member
416 Segmented
417 Formed by multiple washers
418 Formed by plural grooves or projections on opposing surfaces
419 Interfitting or overlapping
420 And axially oriented
421 Having installation, removal, assembly, disassembly, or repair feature
422 Floating ring or bushing
423 Impeller (e.g., slinger, etc.)
...Rib or groove on radial extending surface
...And static sealing means affected by rotational movement
...Actuated by counterweight
...Forms centrifugal liquid barrier
...Having cup or chamber inside the impeller or another rotating member
...Fluid collector or receiver
...Helical groove or thread on axially extending surface
...Formed by pressurized sealing fluid introduced to form barrier
...External device or system
.Centrifugal force affects change in displacement, shape, or contact
.Piston ring or piston ring expander or seat therefor
...Having installation, removal assembly, disassembly, or repair feature
...Piston ring having peripheral radially sealing flexible projection (e.g., piston cup, etc.)
...Having particular mounting, retaining, or supporting feature
...Having C, U, or V cross-sectional profile
...Axially facing cup
...Piston ring surface of dissimilar material or hardness
...Insert
...Surface coating, plating, or impregnation
...Nitrided
...Chromium
...Rotation limiting feature (i.e., antirotation)
...Between rings
...Floating piston ring
...Material other than metal
...Particular piston seat
...Helical form
...Stepped walls
...Oblique wall
...More than one oblique wall
...Having parallel walls
...Arcuate wall
...Coating, treatment, or wall insert
...Having passageway for fluid return, pressure relief, or venting
.Piston ring having single piece noncircular or multiturn (e.g., helical, spiral, oblong, elliptical, polygonal, etc.) shape
...Piston ring including exposed port, slot, pocket, groove, channel, recess, or bevel
...Circumferential groove, channel, recess, or bevel
...Axially spaced......Ports
...Ports
...Circumferentially spaced ports
...Circumferentially spaced slots, pockets, grooves, channels, recesses, or bevels
...Piston ring displays twisting or torsion
...Particular piston ring expander
...Separate and other than metal
...Bias limiting feature
...Adjustable loading feature
...Thermal expansion feature
...Annular expander nested in annular groove of the piston ring
...Between piston rings
...And contacting surfaces therebetween are complementary
...Having more than one pair of such surfaces
...Inclined or beveled groove contacting expander having dissimilar contour
...Slotted or undulating circular band including inclined or axially facing seat for the piston ring
...Axially spaced axially facing seats
...Circular band having radially displaced undulations
...Circular band having axially displaced undulations
...U-shaped circular band radially directed either inwardly or outwardly throughout its circumference
CLASS 277 SEAL FOR A JOINT OR JUNCTURE

482 ...Circumferentially spaced separately seated radially acting bias feature

483 ...Disposed in socket or about pin

484 ...Radially extending tongue formed from expander

485 ...Undulating periphery providing axially extending face against inner perimeter of the piston ring

486 ...Bias feature adjoining opposed ends of split or segmented piston ring

487 ...Segmented

488 ...For axially adjacent piston rings

489 ...Sectional piston ring structure

490 ...Eccentric or variable thickness component ring

491 ...C, L, T, U, V, or Z cross-sectional profile

492 ...Three or more sections

493 ...Segmented piston ring

494 ...Separate bridging piece for gap in piston ring

495 ...Secured to end

496 ...Split single piece piston ring having opposed asymmetrical mirrored ends

497 ...Arcuate or beveled mating surfaces

498 ...Split single piece piston ring having other than opposed asymmetrical mirrored ends

499 ...Arcuate or beveled mating surfaces

500 ...Circumferential contact seal for other than piston

501 ...And magnetic bias

502 ...For valve stem in internal combustion engine

503 ...Accommodates gyratory or oscillatory motion

504 ...Flexible connection between seal and another part

505 ...Oscillates perpendicularly to axis of motion

506 ...Arcuate bearing surface

507 ...Partially spherical

508 ...Axially spring biased

509 ...Coaxial spring

510 ...Contained or compressed by gland member in packing box

511 ...Having installation, removal, assembly, disassembly, or repair feature

512 ...Fluid introducer or director

513 ...External device or system

514 ...Drain, pressure relief, or vent

515 ...Passage through axial facing surface

516 ...Spacer between seals (e.g., lantern ring, etc.)

517 ...Between packing boxes

518 ...Plural distinct packing boxes

519 ...Segmented packing boxes

520 ...Particular gland feature

521 ...Segmented

522 ...Spring bias

523 ...Disposed about external bolt or stud

524 ...Eye or T-type bolt

525 ...Internally threaded

526 ...Externally threaded

527 ...Wear sleeve

528 ...Helically coiled packing

529 ...Having particular cross-sectional seal profile

530 ...C-, M-, U-, V-, X-, or Z-shaped

531 ...Wedging surface

532 ...Made of elastomer or plastic

533 ...Segmented

534 ...Particular seal material or construction

535 ...Composite

536 ...Fibrous component

537 ......Braided, woven, or twisted

538 ......Distinct sheath or covering

539 ....Graphite

540 ....Elastomer or plastic

541 ....Metal

542 ...Consisting of loose-fill type packing

543 ...Segmented ring

544 ...Having pressure balancing or radial bias reduction feature

545 ...Radial biasing spring element other than nominal garter spring

546 ...Particular segment end structure

547 ....Interfitting projection and recess

548 ...Plural complementary interfitting rings
549  Peripheral radially sealing flexible projection (e.g., lip seal, etc.)
550  Made of metal or is a scraper
551  Having installation, removal, assembly, disassembly, or repair feature
552  Having pressure relief or venting feature
553  Bias feature other than nominal garter spring
554  Embedded spring
555  Radially extending finger spring
556  Material other than metal
557  Axially extending helical or spiral spring
558  Particular fluid pressure responsive bias
559  Hydrodynamic sealing feature
560  Dimensional aspect of the flexible projection (e.g., angle, length, radius, thickness, etc.)
561  Intermediate flexible bending portion
562  Plural peripheral radially sealing flexible projections
563  Having interposed fluid receiver or director
564  Having insert between the flexible projections
565  On radial facing side of single seal
566  Both radial sides of the single seal (e.g., X-shaped, Y-shaped, etc.)
567  Radially facing U or V cross-sectional profile
568  Including an excluder or wiper
569  Lining or insert
570  Made entirely of fluorocarbon material
571  Wear sleeve
572  Particular mounting, frame, casing, or reinforcement feature
573  Peripheral mounting static seal
574  Protrusion or bead cross-sectional profile
575  Secured by molding or bonding
576  Secured by clamping
577  By distinct members
578  Having circumferentially adjustable biasing element
579  Having floating ring or bushing (i.e., circumferentially contacting)
580  Radially translatable in groove
581  And biased
582  Made of elastomer or plastic
583  Inflatable seal or seal biased by inflatable member
584  Extrusion preventing (i.e., antiextrusion) structure
585  Elongated sleeve or bushing
586  Seated in groove having stepped walls
587  Seated in groove having oblique wall
588  Radially backed by resilient or elastomeric member

SEAL BETWEEN FIXED PARTS OR STATIC CONTACT AGAINST RELATIVELY MOVABLE PARTS

591  Contact seal between parts of internal combustion engine
592  Particular coating or layer of sealing material
593  Having compression limiting feature
594  Particular dimensions or configuration of sealing bead or formation
595  Metallic
596  Elastomeric
597  Heat dissipating, cooling, or insulating feature
598  Having installation, removal, assembly, disassembly, or repair feature
599  Having flow restrictor
600  Covering member or eyelet for opening
601  Covering fire ring or sealing formation
602  Contact seal for a pipe, conduit, or cable
603  Plural interfitting seal members for installation on the individual joined pipes, conduits, or cables
604  Allows rolling or folding
605  Hollow, fluid-filled, or inflatable
606  And wall
607  Sleeve type
CLASS 277 SEAL FOR A JOINT OR JUNCTURE

Inserted between end-to-end pipe, conduit, or cable joint

Having installation, removal, assembly, disassembly, or repair feature

Spirally wound structure

Extrusion preventing (i.e., antiextrusion) or compression limiting feature

Having plural projections

Hose coupling

Each end has recess for the seal

Having axially spaced projections

Having associated mounting or retaining feature

Molded or cast into the pipe, conduit, or cable

Axially related or embedded coil spring

Axially related backing ring

Clamping gland

Particular axially acting feature

Threaded gland

Particular gland shape

And seal secure together

Particular and located on the pipe, conduit, or cable

Particular seal shape

Particular seal material or construction

Contact seal for other than internal combustion engine, or pipe, conduit, or cable

Magnetic

Having installation, removal, assembly, disassembly, or repair feature

Split including end joining structure

Segmented periphery

Spirally wound structure

Flexible sleeve, boot, or diaphragm

Dome-, cup-, or bell-shaped, or for ball joint

Tubular or frustoconical shape having corrugated wall portion

Having particular associated mounting or retaining feature

Extrusion preventing (i.e., antiextrusion) structure

Compression limiting feature

Anchoring feature extending through seal

Groove structure on the seal or part

Channel-shaped

Single seat formed by plural recesses

Particular cross-sectional seal profile

Hollow or filled chamber

Inflatable

C-, U-, or V-shaped

Plural projections along sealing surface

Plural projections along opposite sealing surfaces

Particular projections along sealed surfaces

Particular seal shape

Particular seal material or construction

Embedded reinforcement

Distinct sheath or covering

Metal

Plural layers

CROSS-REFERENCE ART COLLECTIONS

SEAL FOR STERLING ENGINE

SEAL FOR ROTATING KILN OR DRUM

VISCOS SEAL

T-SHAPED OR I-SHAPED RING MEMBER INCLUDING SEAL ON A SIDE

SEAL FOR ARTICLE OF INDEFINITE LENGTH (E.G., STRIP, SHEET, ETC.)

PASSAGEWAY IN ROD OR SHAFT

SEAL FOR USE IN ROTATING AND RECIPROCATING ARRANGEMENT

SIMILAR SEALING STRUCTURES FOR MOUNTING ON PISTON AND ABOUT ROD

O-RING SEAL

SEAL COMBINED WITH NOMINAL MOTION TRANSMITTING DEVICE

Spline connection

SEAL FOR FLUID PRESSURE BELOW ATMOSPHERIC (E.G., VACUUM, ETC.)

BACKUP SEAL FOR FAILURE OF PRIMARY SEAL

SEAL INCLUDING COMPRESSION SET FEATURE

SEAL INCLUDING VIBRATION DAMPING FEATURE

June 2008
Any foreign patents or non-patent literature from subclasses that have been reclassified have been transferred directly to FOR Collections listed below. These Collections contain ONLY foreign patents or non-patent literature. The parenthetical references in the Collection titles refer to the abolished subclasses from which these Collections were derived.

FOR 100 RADially contained PACKING WITH AXIALLY ACTING FOLLOWER (277/102)
FOR 101 .Piston (277/103)
FOR 102 .Sectional follower (277/104)
FOR 103 .Bolted flange (277/105)
FOR 104 ..Spring biased flange (277/106)
FOR 105 .With operating handle (277/107)
FOR 106 .With tool engaging means (277/108)
FOR 107 .Weight actuated (277/109)
FOR 108 .Screw thimble (277/110)
FOR 109 ..With locking means (277/111)
FOR 110 .Screw (277/112)
FOR 111 .With operating mechanism (277/113)
FOR 112 .Unidirectional movement (277/114)
FOR 113 .Tapered follower or box (277/115)
FOR 114 ..Arcuate (277/116)
FOR 115 .Axially related backup member
raidally actuated by movement of follower (277/116.2)
FOR 116 .Telescoping actuator (277/116.4)
FOR 117 ..With inserted sleeve expander (277/116.6)
FOR 118 ..Deflected packing (277/116.8)
FOR 119 .W edging surfaces (277/117)
FOR 120 ..Internal shell (277/118)
FOR 121 ..Split or segmental packing (277/119)
FOR 122 ..Expanding and contracting (277/120)
FOR 123 . . . . . .Elastomeric (277/121)
FOR 124 ..Contracting (277/122)
FOR 125 .Plural packing elements (277/123)
FOR 126 ..Nested (277/124)
FOR 127 ..Diverse (277/125)
FOR 128 EXTERNALLY OPERATED ADJUSTMENT (277/126)
FOR 129 .Fluid motor (277/127)
CLASS 277 SEAL FOR A JOINT OR JUNCTURE

FOR 132 LATERAL ACCESS TO PACKING BOX (277/130)

FOR 133 With distinct closure (277/131)

FOR 134 ..Packing attached (277/132)

FOR 135 IMPELLER TYPE (277/133)

FOR 136 Axially acting(277/134)

FOR 137 LIQUID BARRIER (277/135)

FOR 138 WITH ANTIROTATION KEY OR ANCHOR (277/136)

FOR 139 .Radial wall(277/137)

FOR 140 WITH DISTINCT RADIIALLY ACTING BIAS(277/138)

FOR 141 .Unitary packing spacer and bias means (277/139)

FOR 142 .U-section (277/140)

FOR 143 .Common bias for axially spaced packings (277/141)

FOR 144 With axially acting bias means (277/142)

FOR 145 .With axially component (277/143)

FOR 146 Complementary inclined surfaces (277/144)

FOR 147 Transversely symmetrical (277/145)

FOR 148 With bias restrainer (277/146)

FOR 149 With adjustable loading means (277/147)

FOR 150 Individually biased segments (277/148)

FOR 151 Circumferentially biased segments (277/149)

FOR 152 With radial pin or socket (277/150)

FOR 153 Circumferential thrust (277/151)

FOR 154 Axial lip or boss (277/152)

FOR 155 Exposed coil spring (277/153)

FOR 156 Interfitted segments (277/154)

FOR 157 With bridging segments (277/155)

FOR 158 Break joint (277/156)

FOR 159 Periphery engaging spring (277/157)

FOR 160 Incompatible shapes (277/158)

FOR 161 Radially extending tongues (277/159)

FOR 162 Wave or undulate (277/160)

FOR 163 Polygonal (277/161)

FOR 164 Open-end (277/162)

FOR 165 Spiral (277/163)

FOR 166 Embedded or enclosed spring (277/164)

FOR 167 Nonmetallic (277/165)

FOR 168 ANCHOR EXTENDING THROUGH OR INTERFITTED WITH PACKING (277/166)

FOR 169 HELICAL SEAT (277/167)

FOR 170 SERIALLY ARRANGED, SEPARATELY SEATED OR ANCHORED PACKING MEMBERS (277/167.3)

FOR 171 SINGLE SEAT FORMED BY OPPOSED RECESSES IN PLURAL MEMBERS (277/167.5)

FOR 172 Latitudinally stepped or tapered seat (277/168)

FOR 173 Arcuate wall (277/169)

FOR 174 Oblique wall (277/170)

FOR 175 ..Plural (277/171)

FOR 176 Parallel (277/172)

FOR 177 FLOATING PACKING MEMBER (277/173)

FOR 178 Radially translatable (277/174)

FOR 179 Axially spring pressed (277/175)

FOR 180 Additional member (277/176)

FOR 181 Elastomeric (277/177)

FOR 182 INTERFITTING WITH RADIIALLY PROJECTING FLANGE (277/178)

FOR 183 EMBEDDED REENFORCEMENT OPPOSING TAPERED MOUNTED FLANGE (277/179)

FOR 184 WITH COMPRESSION STOP (277/180)

FOR 185 PACKING ATTACHED RETAINER (277/181)

FOR 186 Peripheral shell (277/182)

FOR 187 With radial mounting flange (277/183)

FOR 188 Channel-shaped (277/184)

FOR 189 Plural at axially opposed ends (277/185)

FOR 190 Resilient (277/186)

FOR 191 PACKING CHAMBER OR SEAT WITH SEPARABLE END WALL (277/187)

FOR 192 WITH AXIALLY RELATED BACKING OR RETAINING MEMBER (277/188 R)

FOR 193 With anti-extrusion rings (277/188 A)

FOR 194 WITH ANCHOR OR RETAINER (277/189)

FOR 195 COMPOSITE SEAT (277/189.5)

FOR 196 WEDGING PORTIONS (277/190)

FOR 197 Enclosed (277/191)

FOR 198 SEGMENTAL (277/192)

FOR 199 Axially related segments (277/193)

FOR 200 ..L-shaped (277/194)

FOR 201 ..With radially related segment (277/195)

FOR 202 ..Coiled or corrugated segment (277/196)
CLASS 277 SEAL FOR A JOINT OR JUNCTURE

FOR 202 . Diametrically opposed splits
(277/197)

FOR 203 . Concentric segments (277/198)
FOR 204 . Interfitting segments (277/199)
FOR 205 . Axially spaced flanges with
corrugated connecting web
(277/200)
FOR 206 . Annulus with duct or passageway
(277/201)
FOR 207 . Concentric segments (277/198)
FOR 208 . Interfitting segments (277/199)
FOR 209 . Helical (277/203)
FOR 210 . Annulus with duct or passageway
(277/201)
FOR 211 . Flexible U- or V-cup (277/205)
FOR 212 . Radially facing (277/206 R)
FOR 213 . X-shape (277/206 A)
FOR 214 . Ribbed contact surface (277/207 R)
FOR 215 . Axially spaced (277/208)
FOR 216 . Opposite surfaces (277/209)
FOR 217 . Line contact (277/210)
FOR 218 . Opposite surfaces (277/211)
FOR 219 . Pipe joints or connections (277/207 A)
FOR 220 . Flexible cup or flange type (277/212 R)
FOR 221 . Flexible cup type (277/212 C)
FOR 222 . Flange (277/212 F)
FOR 223 . Flexible boot (277/212 FB)
FOR 224 . Corrugated contact surface (277/213)
FOR 225 . Circumferential groove in
peripheral surface (277/214)
FOR 226 . With spaced pockets, grooves, or
recesses (277/215)
FOR 227 . Split annulus (277/216)
FOR 228 . Variable radius (277/217)
FOR 229 . With separate gap or bridging
piece (277/218)
FOR 230 . End secured (277/219)
FOR 231 . With joining structure (277/220)
FOR 232 . End-to-end tongue and slot
(277/221)
FOR 233 . Beveled or arcuate mating
surfaces (277/222)
FOR 234 . With insert (277/223)
FOR 235 . Hard material (277/224)
FOR 236 . With intermediate radial
peripheral flange (277/225)
FOR 237 . Fluent or vacuum core (277/226)
FOR 238 . Composite (277/227)
FOR 239 . Elastomeric core (277/228)
FOR 240 . Distinct sheath (277/229)
FOR 241 . Woven or braided strands (277/230)
FOR 242 . Reentrant contact surface (277/231)
FOR 243 . Enclosing plural plies (277/232)
FOR 244 . Plural planar or conical plies
(277/233)
FOR 245 . Metal faced (277/234)
FOR 246 . Including metal (277/235 R)
FOR 247 . Planar coating (277/235 A)
FOR 248 . Engine gasket (277/235 B)
FOR 249 . Metallic (277/236)
FOR 250 . Miscellaneous (277/237 R)
FOR 251 . Dust guard (277/237 A)

June 2008