Title: WET CUP THROAT SEAL AND BEARING ASSEMBLY

Abstract: Wet cup throat seal (3) and bearing (2) combination is designed for use in a reciprocating piston pump where in the wet cup (1) is designed to hold the seal assembly thereby insuring proper displacement rod (5) alignment and maximizing seal life. The construction also allows for easy and inexpensive replacement and allows piston seals (6) and throat seals (3) to be interchangeable.
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

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Published:

— With international search report.
WET CUP THROAT SEAL AND BEARING ASSEMBLY

TECHNICAL FIELD

A wet cup throat seal and bearing combination is designed for use in a reciprocating piston pump where in the wet cup is designed to hold the seal assembly.

BACKGROUND ART

Wet cups and throat seals are well known for use in reciprocating piston pumps. While prior art devices have been generally satisfactory, it is always desirable to increase ease of manufacture, seal life and ease of servicing while decreasing cost.

DISCLOSURE OF THE INVENTION

A wet cup is machined from hexagonal stainless steel bar stock. A bearing is a cut shoulder bearing which is machined from acetal bar. The throat seal is a standard U-cup seal. The wet cup and the bearing are assembled into an outlet housing. The bearing guides the displacement rod and the seal prevents leakage as the displacement rod reciprocates.

The wet cup and cylinder are sized so that the piston seals and throat seals are interchangeable. The shoulder on the bearing insures that the bearing will remain coaxial
with the wet cup and the pump. The combination can be serviced by unscrewing the wet

cup from the outlet housing while the bearing and throat seal can be removed from the wet
cup without tools.

These and other objects and advantages of the invention will appear more fully

from the following description made in conjunction with the accompanying drawings

wherein like reference characters refer to the same or similar parts throughout the several
views.

**BRIEF DESCRIPTION OF DRAWINGS**

Figure 1 is an exploded view of a pump utilizing the inventive wet cup bearing and

seal assembly.

Figure 2 is an exploded view of the inventive wet cup bearing and seal assembly.

Figure 3 is a cross-sectional view of the inventive wet cup bearing and seal

assembly.

**BEST MODE FOR CARRYING OUT THE INVENTION**

Wet cup 1 is machined from hexagonal stainless steel bar stock. Bearing 2 is a cut

shoulder bearing which is machined from acetal bar. Throat seal 3 is a standard U-cup

seal. The combination is assembled as shown in FIGS 1, 2, and 3. Wet cup 1 is assembled
into an outlet housing 4 and the bearing 2 to an outlet housing 4. The bearing 2 guides the
displacement rod 5 and seal 3 prevents leakage as the displacement rod reciprocates.

Wet cup 1 and cylinder 7 are sized so that piston seals 6 and throat seals 3 are
interchangeable. Such a combination insures long seal life in acid catalyzed lacquers
without requiring adjustments to the seals. The shoulder on the bearing insures that the
bearing will remain coaxial with the wet cup and the pump. The combination can be
serviced by unscrewing the wet cup 1 from the outlet housing 4 while the bearing 2 and
throat seal 3 can be removed from the wet cup without tools. There is no requirement to
disassemble the remainder of the displacement pump.

In the event of throat seal failure and there are no spare seals on hand, a use could
switch the downward facing piston seal and the throat seal and continue operating the
pump.

It is contemplated that various changes and modifications may be made to the
assembly without departing from the spirit and scope of the invention as defined by the
following claims.
CLAIMS

1. A wet cup throat seal and bearing assembly for use on a reciprocating piston pump having a housing and a displacement rod which reciprocates along an axis, said assembly comprising:

   a wet cup threadedly engaged in said housing;

   an plastic bearing having a shoulder and a cut parallel to said axis; and

   a throat seal, wherein said bearing and said throat seal are disposed around said displacement rod and retained between said housing and said wet cup.

2. The wet cup throat seal and bearing assembly of claim 1 wherein said throat seal is a U-cup seal.

3. The wet cup throat seal and bearing assembly of claim 1 wherein said bearing is formed from acetal.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
   IPC(7) : F16C 29/02
   US CL. : 384/16
   According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELD(S) SEARCHED
   Minimum documentation searched (classification system followed by classification symbols)
   U.S. : 384/16, 26, 28, 29, 32

   Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

   Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tbody>
<tr>
<td>A</td>
<td>US 5,098,071 A (UMETSU) 24 March 1992 (24.03.92).</td>
<td>1-3</td>
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<tr>
<td>A</td>
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<td>A</td>
<td>US 3,870,381 A (OVERKOTT) 11 March 1975 (11.03.75).</td>
<td>1-3</td>
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☐ Further documents are listed in the continuation of Box C.  ☐ See patent family annex.

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Date of the actual completion of the international search: 05 SEP 2000
Date of mailing of the international search report:

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231
Facsimile No. (703)305-3230

Authorized officer: Thomas R. Hannon
Telephone No. (703) 308-2691

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