

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 000102-0020-WO1	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2018/046104	International filing date (<i>day/month/year</i>) 9 August 2018 (09-08-2018)	(Earliest) Priority Date (<i>day/month/year</i>) 9 August 2017 (09-08-2017)
Applicant ETAGEN, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

- the international application in the language in which it was filed
 a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. **Certain claims were found unsearchable** (See Box No. II)

3. **Unity of invention is lacking** (see Box No III)

4. With regard to the **title**,

- the text is approved as submitted by the applicant
 the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- the text is approved as submitted by the applicant
 the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 2
 as suggested by the applicant
 as selected by this Authority, because the applicant failed to suggest a figure
 as selected by this Authority, because this figure better characterizes the invention
- b. none of the figures is to be published with the abstract

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

A ringset (220, 230) is configured to be arranged on a piston (226) for sealing a gas in a high-pressure region of a cylinder (260) in the absence of oil or other liquid lubricant. The ringset includes one or more rings made from a high-strength material as a sealing element. The ringset also includes a solid lubricant applicator (261) configured to provide lubrication between the one or more rings and a bore (262) of the cylinder. For example, the ring can support pressure loads from high-pressure gas without breaking, while the applicator need not act as a seal. As the piston reciprocates in the bore, the applicator slides against the bore and applies solid lubricant material to the bore, resulting in a solid lubricant film on the bore against which the sealing element may slide. The applicator includes a material such as a graphite, a polymer, or other suitable solid lubricant.

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International application No
PCT/US2018/046104

A. CLASSIFICATION OF SUBJECT MATTER
 INV. F16J9/26 F16J1/08 F02F3/00 F02F5/00
 ADD.
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 F16J F02F

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)
 EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP H02 78752 A (RIKEN KK) 19 March 1990 (1990-03-19) paragraph [0001]; claim 1; figure 1 -----	1-30
X	US 5 598 763 A (RAO V DURGA N [US] ET AL) 4 February 1997 (1997-02-04) claims 1, 8; figure 3 -----	1-30

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search

22 October 2018

Date of mailing of the international search report

02/11/2018

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2018/046104

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP H0278752	A	19-03-1990	NONE

US 5598763	A	04-02-1997	DE 19504803 A1 21-09-1995
			GB 2287520 A 20-09-1995
			JP H07269709 A 20-10-1995
			US 5598763 A 04-02-1997
