

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P13204W01A	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2015/030486	International filing date (<i>day/month/year</i>) 13 May 2015 (13.05.2015)	(Earliest) Priority Date (<i>day/month/year</i>) 13 May 2014 (13.05.2014)
Applicant FIRESTONE INDUSTRIAL PRODUCTS COMPANY, LLC		

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 3 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 43.6bis(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. 5

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.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2015/030486**A. CLASSIFICATION OF SUBJECT MATTER****F15B 15/02(2006.01)i, F15B 15/08(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
F15B 15/02; F16L 21/00; F01B 19/00; B66F 3/24; B60S 9/10; F15B 15/08Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility modelsElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: actuator, pneumatic, flexible, bellows, diaphragm, reaction, reinforcement, folding, collapsing, and bending**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2003-0140783 A1 (LEONARD et al.) 31 July 2003 See paragraphs [0027]-[0029] and figures 3-6.	1-18
Y	US 3319532 A (PRIDHAM JR., DONALD C.) 16 May 1967 See column 2, line 14 - column 3, line 9 and figures 2, 3.	1-18
A	US 6398266 B1 (CRUMP, CHET M.) 04 June 2002 See column 5, line 3 - column 6, line 12 and figure 3.	1-18
A	JP 2009-248709 A (KAWASAKI KOGYO K.K.) 29 October 2009 See paragraphs [0009]-[0019] and figures 1-3.	1-18
A	JP 2003-285995 A (MITSUBISHI JUKO KOJI K.K. et al.) 07 October 2003 See paragraphs [0006]-[0017] and figure 2.	1-18

 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 July 2015 (22.07.2015)

Date of mailing of the international search report

23 July 2015 (23.07.2015)

Name and mailing address of the ISA/KR

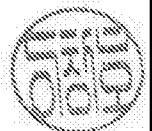
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2015/030486

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003-0140783 A1	31/07/2003	AU 2002-349993 A1 DE 60208080 D1 DE 60208080 T2 EP 1476665 A1 EP 1476665 B1 US 6612223 B2 WO 03-064863 A1	02/09/2003 19/01/2006 29/06/2006 17/11/2004 14/12/2005 02/09/2003 07/08/2003
US 3319532 A	16/05/1967	None	
US 6398266 B1	04/06/2002	AU 7828700 A CA 2385017 A1 DE 60018950 D1 DE 60018950 T2 EP 1214542 A1 EP 1214542 B1 JP 2003-528653 A WO 01-21995 A1	24/04/2001 29/03/2001 28/04/2005 28/07/2005 19/06/2002 23/03/2005 30/09/2003 29/03/2001
JP 2009-248709 A	29/10/2009	None	
JP 2003-285995 A	07/10/2003	JP 4039877 B2	30/01/2008