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(54) **CONNECTING ELEMENT FOR PROVIDING FLUIDIC CONNECTION BETWEEN VESSELS**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,421,296	A	12/1983	Stephens	
5,535,785	A	7/1996	Werge et al.	
5,901,942	A	5/1999	Lopez	
6,170,800	B1	1/2001	Meloul et al.	
7,296,782	B2	11/2007	Enerson et al.	
2007/0007478	A1*	1/2007	Leinsing et al.	A61M 39/26 251/149.1
2010/0108681	A1*	5/2010	Jepson et al.	A61J 1/1475 220/278

FOREIGN PATENT DOCUMENTS

DE	40 26 524	A1	3/1992
DE	10 2010 047 747	A1	4/2012
JP	2004-257521	A	9/2004
WO	WO 98/11931	A1	3/1998
WO	WO 2006/078355	A1	7/2006
WO	WO 2009/111596	A2	9/2009
WO	WO 2010/111546	A2	9/2010

OTHER PUBLICATIONS

German Search Report, Appl. No. 10 2013 220 073.0, Feb. 28, 2014, 5 pgs.
European Search Report, Appl. No. 14186337.3, Feb. 6, 2015, 5 pgs.

* cited by examiner

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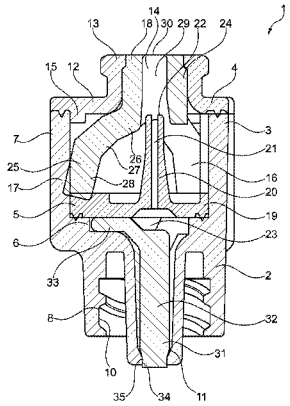
(57) **ABSTRACT**

The invention relates to a connecting element, in particular for connecting vessels and for producing a fluidic connection between vessels or elements joined to the connecting element. The invention also relates to an elastic spring element as a valve element.

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