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### (54) Microfabricated elastomeric valve and pump systems

(57) A method of fabricating an elastomeric structure, comprising: forming a first elastomeric layer on top of a first micromachined mold, the first micromachined mold having a first raised protrusion which forms a first recess extending along a bottom surface of the first elastomeric layer; forming a second elastomeric layer on top of a second micromachined mold, the second micromachined mold having a second raised protrusion which

forms a second recess extending along a bottom surface of the second elastomeric layer; bonding the bottom surface of the second elastomeric layer onto a top surface of the first elastomeric layer such that a control channel forms in the second recess between the first and second elastomeric layers; and positioning the first elastomeric layer on top of a planar substrate such that a flow channel forms in the first recess between the first elastomeric layer and the planar substrate.

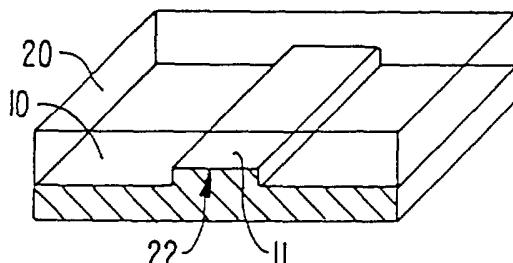


FIG. 1.



## EUROPEAN SEARCH REPORT

Application Number  
EP 01 12 8819

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.7)		
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)		
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A	* abstract * * column 2, line 26 - column 5, line 20 * * figures 1-12 * ---	2-4,9, 11,23,30			
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Y	* the whole document *	3-6,8, 10, 17-20, 29,30,33			
A	---	11			
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The present search report has been drawn up for all claims					
Place of search	Date of completion of the search	Examiner			
THE HAGUE	15 November 2002	Kolby, L			
CATEGORY OF CITED DOCUMENTS					
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document					
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons S : member of the same patent family, corresponding document					

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

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None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



## EUROPEAN SEARCH REPORT

Application Number  
EP 01 12 8819

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.7)			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)			
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Y	* abstract *	3-6,8, 10, 17-20, 29,30,33				
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The present search report has been drawn up for all claims						
Place of search	Date of completion of the search	Examiner				
THE HAGUE	15 November 2002	Kolby, L				
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T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document						



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-10, 13-18, 19-20, 21-25, 29-33

An elastomeric membrane is deflectable into the first or second microfabricated channel (dependent claims 4,5)

2. Claim : 11

The second channel (of 3) has wide and narrow portions, the wide portion is disposed adjacent the first channel and the narrow portion is disposed adjacent the third channel.

3. Claim : 12

The membrane has a curved bottom surface, such that the top of the first channel is curved

4. Claim : 26

The first and second elastomeric layers comprise a crosslinking agent

5. Claims: 27,28

The first and second layers are bonded by a layer of adhesive



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A	US 5 660 370 A (WEBSTER MILO E) 26 August 1997 (1997-08-26) * abstract * * column 4, line 8 - column 7, line 49 * * column 9, line 66 - column 12, line 12 * * figures 1-10,13,14 *	1,6,7,11			
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A	* page 3, line 10 - line 18 * * page 3, line 31 - page 5, line 2 * * page 8, line 3 - line 15 *	1,6,7,11	
TECHNICAL FIELDS SEARCHED (Int.Cl.7)			
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	15 November 2002	Kolby, L	
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X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 12 8819

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15-11-2002

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