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(54) **Intake manifold**

(57) An intake manifold has a plurality of branch tubes each joined by brazing in a furnace at one end to a flange on the engine side and at the other end to a surge tank on the throttle chamber side. The surge tank is separated into two pieces or a brazing side member and a non-heating side member. Branch tubes are fixed

in position relative to the brazing side member by peen locking with a peening tool or the like and are then joined to the brazing side member by brazing in the furnace. The non-heating side member is not subjected to the brazing in the furnace but is joined to the brazing side member by bolts or the like.

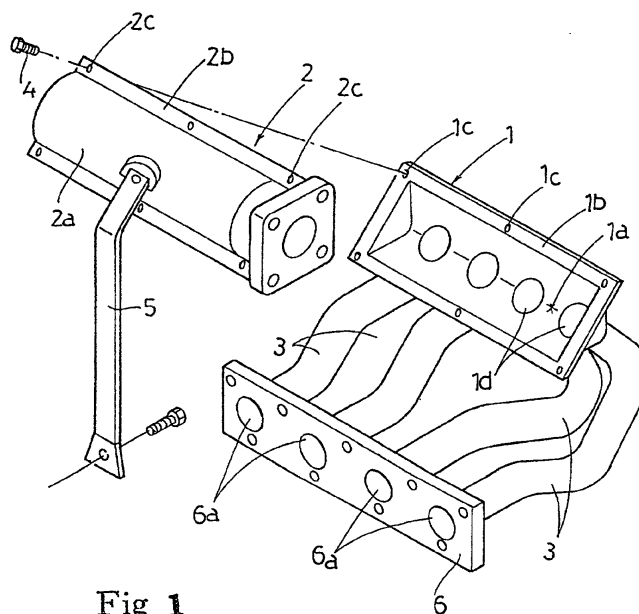


Fig 1



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 5 400 951 A (SHIROYAMA ET AL) 28 March 1995 (1995-03-28) * abstract * * column 3, line 1 - column 4, line 59; figures 1-5 *	1,4	F02M35/104 F02M35/10
A	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 05, 31 May 1996 (1996-05-31) & JP 08 004609 A (FUTABA SANGYO KK), 9 January 1996 (1996-01-09) * abstract *	1,4	
A	US 5 253 616 A (VOSS) 19 October 1993 (1993-10-19)		
A	US 5 357 931 A (SEMENCE) 25 October 1994 (1994-10-25)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			F02M
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 29 August 2000	Examiner Van Zoest, A
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

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

EP 99 31 0372

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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29-08-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5400951 A	28-03-1995	NONE	
JP 08004609 A	09-01-1996	NONE	
US 5253616 A	19-10-1993	NONE	
US 5357931 A	25-10-1994	FR 2697293 A DE 69311498 D DE 69311498 T EP 0595696 A ES 2103450 T	29-04-1994 17-07-1997 29-01-1998 04-05-1994 16-09-1997