

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



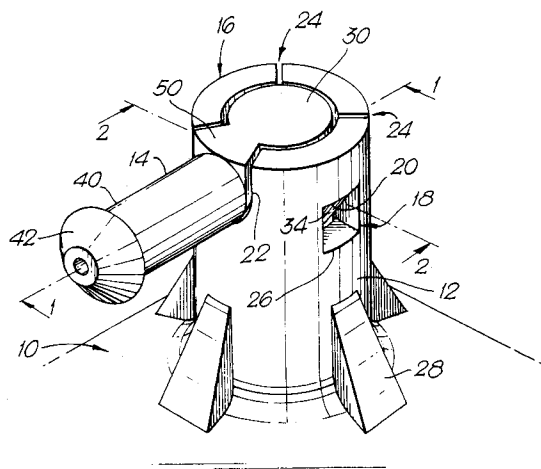
(11) Publication number:

0 654 648 A3

(12)

EUROPEAN PATENT APPLICATION(21) Application number: **94203059.4**(51) Int. Cl.⁶: **F28F 9/02, F16L 37/084,
F28F 9/04**(22) Date of filing: **20.10.94**(30) Priority: **24.11.93 GB 9324184**(43) Date of publication of application:
24.05.95 Bulletin 95/21(84) Designated Contracting States:
DE FR IT(88) Date of deferred publication of the search report:
02.11.95 Bulletin 95/44(71) Applicant: **GENERAL MOTORS CORPORATION**
General Motors Building
3044 West Grand Boulevard
Detroit
Michigan 48202 (US)(72) Inventor: **van Hauten, Hartmut**
Königsberger Strasse 74
D-55268 Nieder-Olm (DE)(74) Representative: **Denton, Michael John et al**
Patent Section
1st Floor
Gideon House
28 Chapel Street
Luton
Bedfordshire LU1 2SE (GB)(54) **Heat exchanger.**

(57) A heat exchanger includes a heat exchanger body (10) from which a connection duct (12) extends. The connection duct (12) includes an elastically deformable free end and two engaging walls (20) formed in respective rectangular apertures (18) proximate the free end of the duct (12). A coupling tube (14) for coupling the heat exchanger body (10) to a hose of an expansion tank includes a first portion (30) receivable in the connection duct (12) which includes two tangs (34) engageable with the engaging walls (20) to secure the coupling tube (14) within the connection duct (12), and a second portion (40) connectable to the expansion tank hose. A U-shaped recess (22) at the free end of the connection tube (12) engages a U-shaped locating portion (50) of the coupling tube (14) to align the coupling tube relative to the heat exchanger body (10).

Fig.1.**EP 0 654 648 A3**



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 20 3059

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.6)
X	US-A-4 730 856 (KATSUSHI) 15 March 1988	1-4	F28F9/02
Y	* column 2, line 42-65; figure 1 *	7-9	F16L37/084
	---		F28F9/04
Y	CH-A-667 506 (EMS-INVENTA) 14 October 1988	7,8	
	* page 3, right column, line 60-64; figure 2 *		

Y	US-A-4 946 204 (BOTICKI) 7 August 1990	9	
	* column 2, line 8 *		

A	DE-A-38 15 168 (RASMUSSEN) 9 November 1989	1	
	* claim 1 *		

A	EP-A-0 501 852 (ATTAX) 2 September 1992	1	
	* claim 1 *		

The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			F16L F28F
Place of search		Date of completion of the search	Examiner
THE HAGUE		31 August 1995	De Gussem, J
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone		T : theory or principle underlying the invention	
Y : particularly relevant if combined with another document of the same category		E : earlier patent document, but published on, or after the filing date	
A : technological background		D : document cited in the application	
O : non-written disclosure		L : document cited for other reasons	
P : intermediate document			
		& : member of the same patent family, corresponding document	