(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 085 737 A1**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
05.08.2009 Bulletin 2009/32

(51) Int Cl.:
F28F 9/02 *(2006.01)*

(21) Application number: **09151647.6**

(22) Date of filing: **29.01.2009**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA RS

(30) Priority: **30.01.2008 CN 200810018987**

(71) Applicant: **Xu, Huixin**
Qingyang town
Jiangying
Jiangsu (CN)

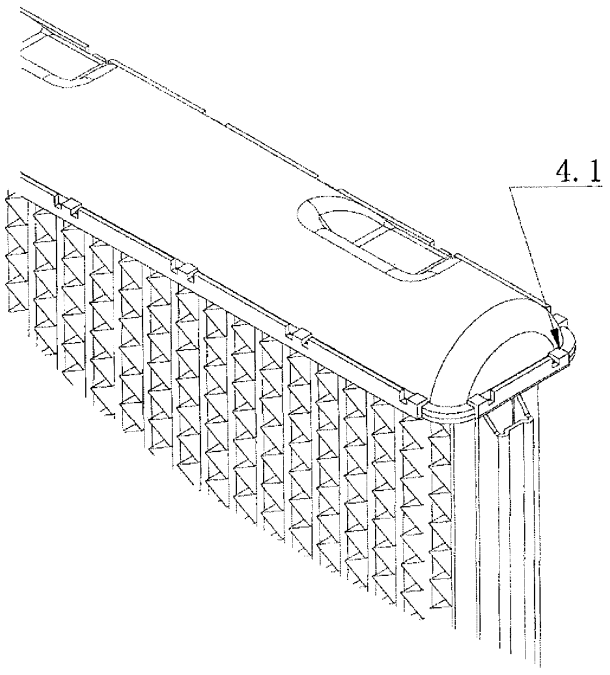
(72) Inventor: **Xu, Huixin**
Qingyang town
Jiangying
Jiangsu (CN)

(74) Representative: **Slingsby, Philip Roy**
Page White & Farrer
Bedford House
John Street
London, WC1N 2BF (GB)

(54) A binding structure between tank and header of automotive heater core

(57) This invention involves a binding structure between tank and header of an automotive heater core, which belongs to the field of auto parts technology. Said structure includes the upper tank(3), the bottom tank(8) and the header(4). Characteristics of said structure are that there are clinching tabs(4.1) around the headers connecting to the upper tank(3) and to the bottom tank(8). Said clinching tabs (4.1) clamp to the edges of the upper tank(3) and the bottom tank(8) . The clamping of clinching tabs to the edges of the tanks structurally ensures the mechanical strength of the binding between the header to the upper tank and to the bottom tank. It ensures a good brazing and firm binding between the tanks and the header.

FIG 6



EP 2 085 737 A1

Description

Technical field

[0001] This invention is applied to an automotive heater core. It is a binding structure between tank and header of automotive heater core. It belongs to the field of auto parts technology.

Background art

[0002] An automotive heater core is a radiator dissipating heat into the car cabin using cooling water from the engine, it includes: inlet pipe, outlet pipe, upper tank, bottom tank, header, tube, cooling fins and side plate. The technique used for manufacturing heater core is brazing. The biggest problem encountered during the manufacturing process is that the brazing between the tank and header is not firm enough thus will cause leak and failure of the heater core.

Summary of invention

[0003] The purpose of this invention is to overcome the above shortages, and to provide a kind of structure to strengthen the binding between tank and header of the automotive heater core.

[0004] Said purpose is achieved through the binding structure between tank and header of automotive heater core, including the upper tank, bottom tank and header, Characteristics of said structure are that there are clinching tabs around the headers connecting to the upper tank and to the bottom tank. Said clinching tabs clamp to the edges of the upper tank and the bottom tank.

The clamping of clinching tabs to the edges of the tanks structurally ensures the mechanical strength of the connection between the header to the upper tank and to the bottom tank. It ensures a good brazing and firm bonding between the tanks and the header.

Brief Description of the attached drawings

[0005]

Fig. 1 is the overall structure of the automotive heater core involved in this invention

Fig.2 is the breakdown of the binding by the clinching tabs between the upper tank and the header of the automotive heater core after clamping

Fig.3 is the breakdown of the binding by the clinching tabs between the bottom tank and the header of the automotive heater core after clamping

Fig.4 is the section view of the breakdown of the bottom tank and the header of the automotive heater core before clamping

Fig.5 is the section view of the breakdown of the upper tank and the header of the automotive heater core before clamping

Fig.6 is the section view of assembly of the bottom tank and header of the automotive heater core after clamping of the clinching tabs.

Fig. 7 is the section view of assembly of the upper tank and header of the automotive heater core after clamping of the clinching tabs.

[0006] In the drawings: inlet pipe 1, outlet pipe 2, upper tank 3, header 4, side plate 5, tube 6, cooling fins 7, bottom tank 8, bottom margin of upper and bottom tank 3.1, tooth 4.1.

Implementation methods

[0007] As shown in Fig.1, an automotive heater core includes 8 parts: inlet pipe 1, outlet pipe 2, upper tank 3, bottom tank 8, header 4, tube 6, cooling fins 7 and side plate 5. As shown in Fig.2,3,4, 5 there are some clinching tabs(4.1) around the headers connecting to the upper tank (3) and to the bottom tank (8), when assembled the clinching tabs (4.1) clamp to the edges of the upper tank (3) and the bottom tank(8) , then the assembled heater core is brazed as shown in Fig. 6, 7. This kind of structure can be applied to header and tank's connection in all types of automotive heater cores and industrial radiators.

Claims

1. A binding structure between tank and header of an automotive heater core , including the upper tank(3), the bottom tank(8) and the header(4). Characteristics of said structure are that there are clinching tabs (4.1) around the headers connecting to the upper tank(3) and to the bottom tank(8). Said clinching tabs (4.1) clamp to the edges(3.1) of the upper tank(3) and the bottom tank(8).

Fig 1

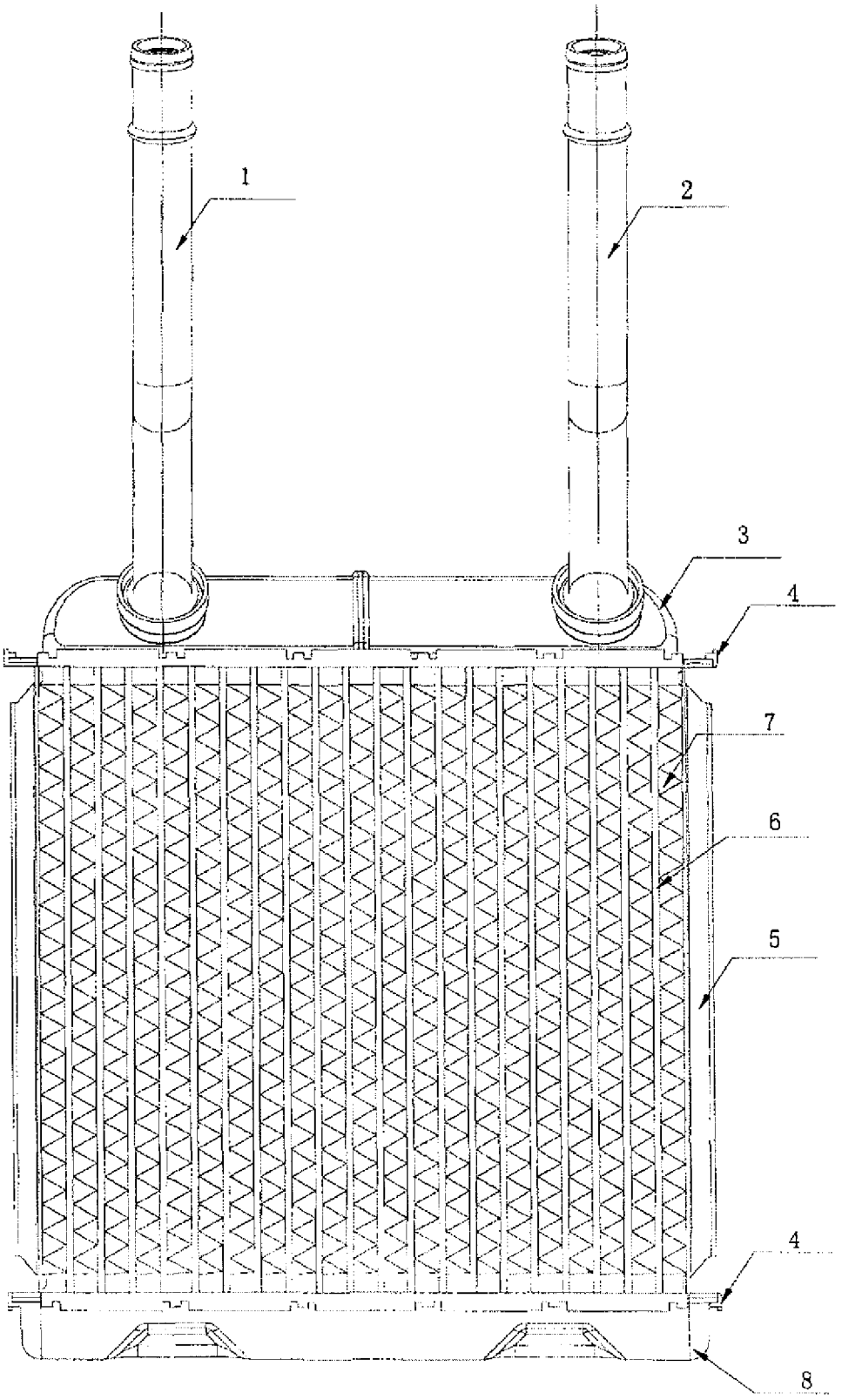


FIG 2

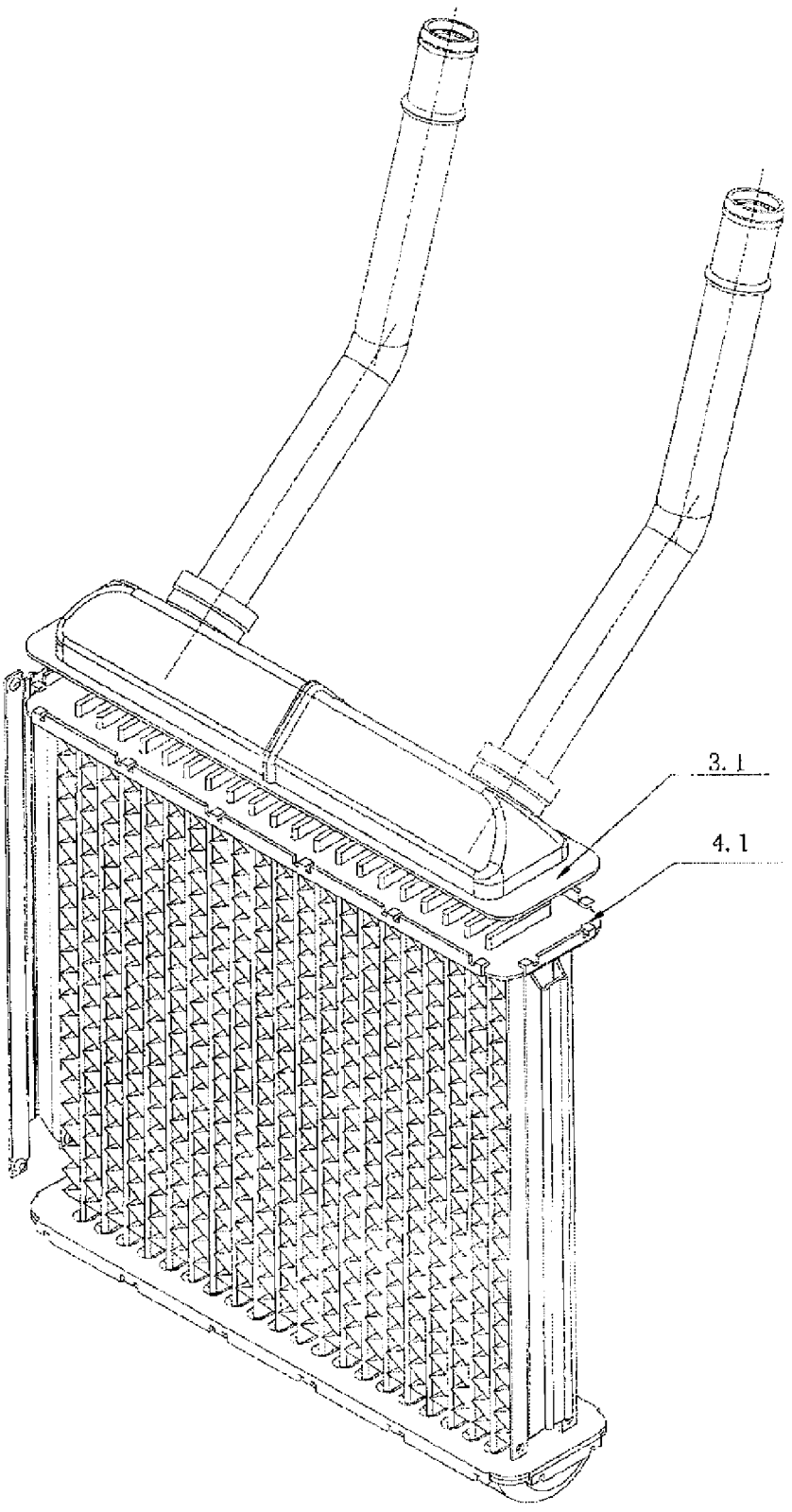


FIG 3

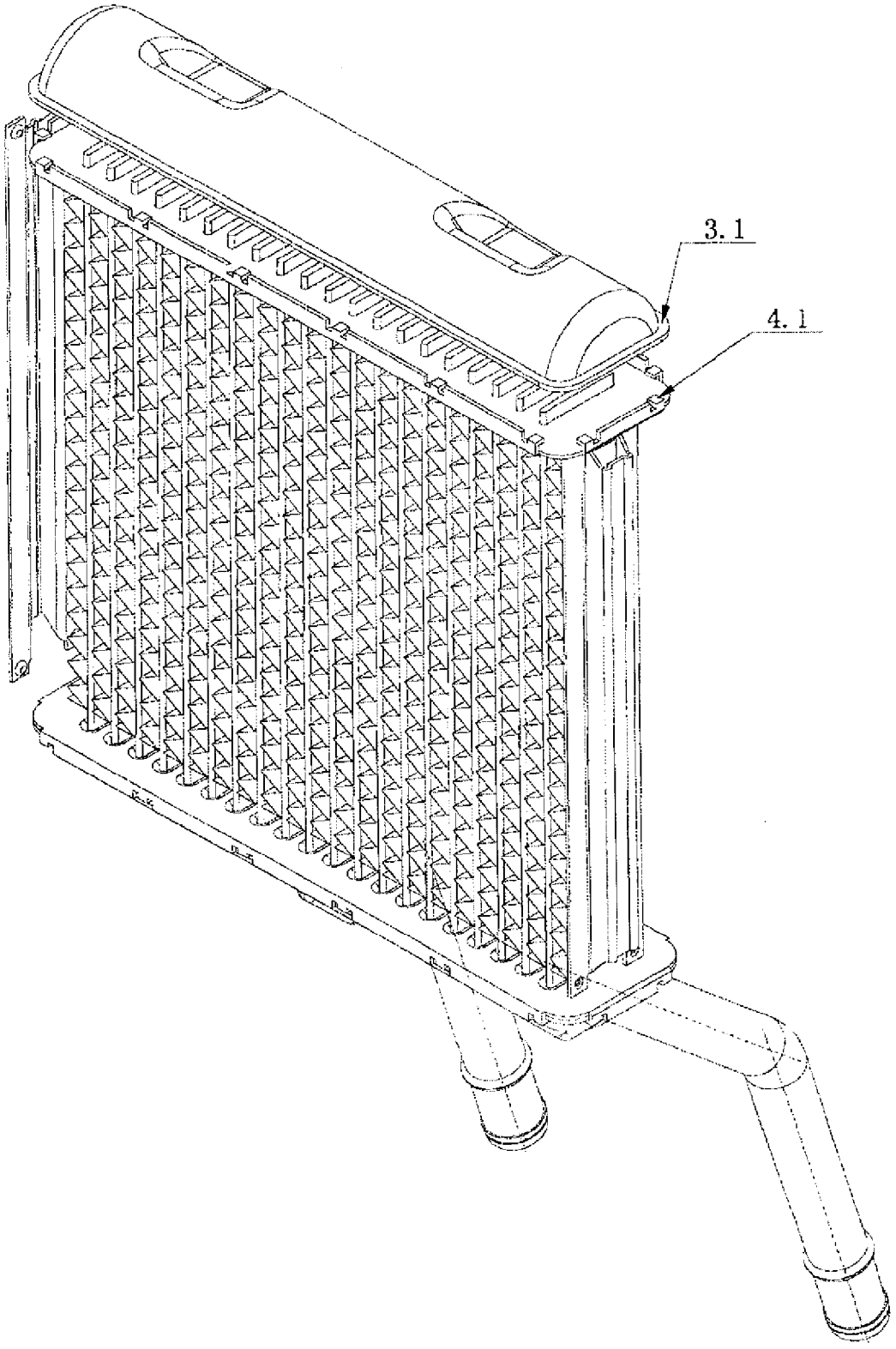


FIG 4

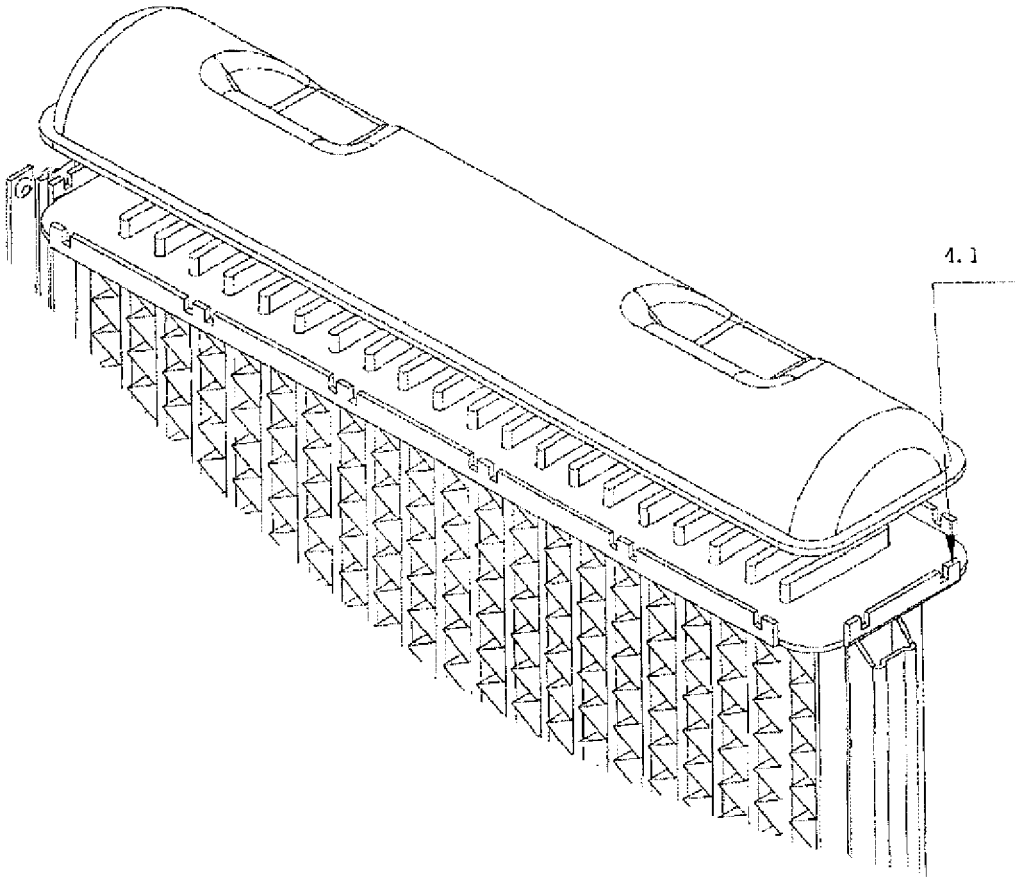


FIG 5

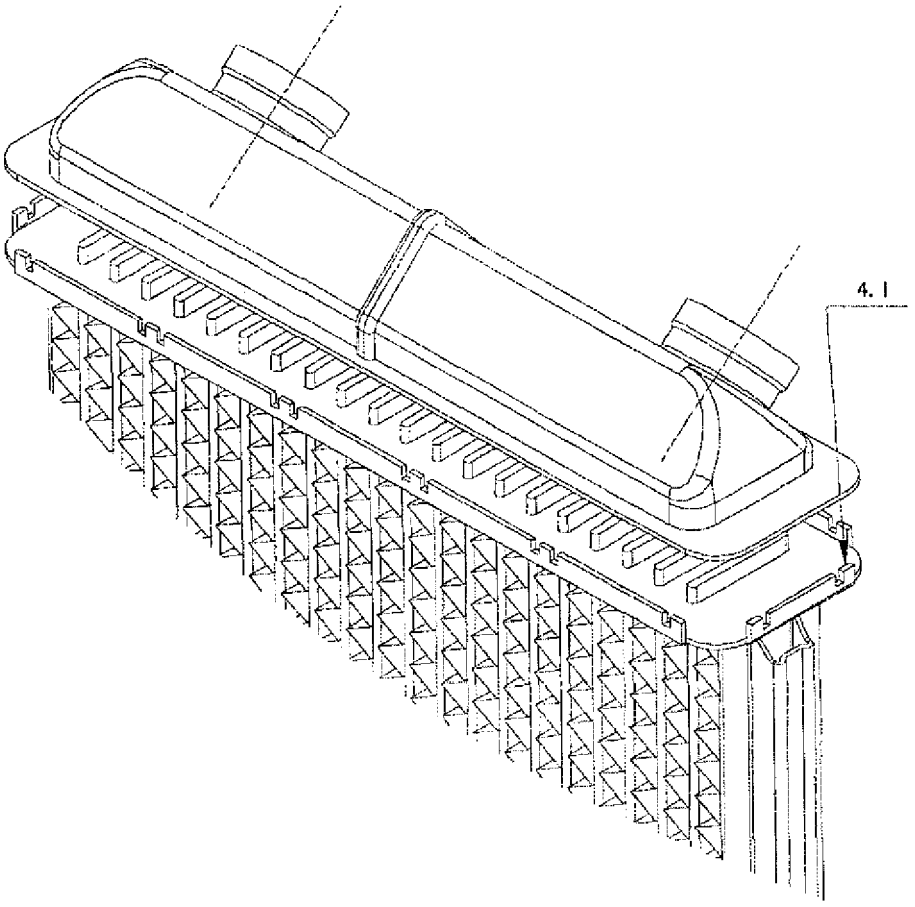


FIG 6

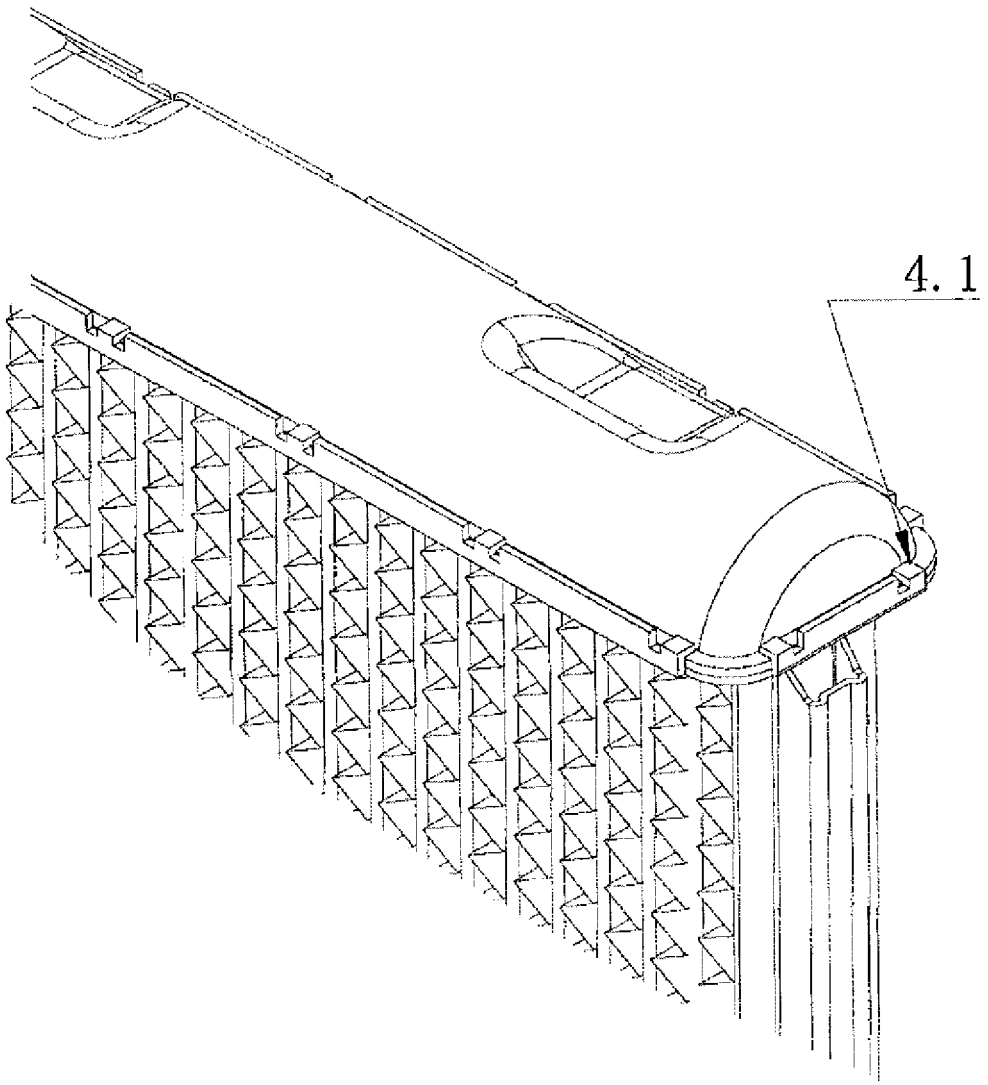
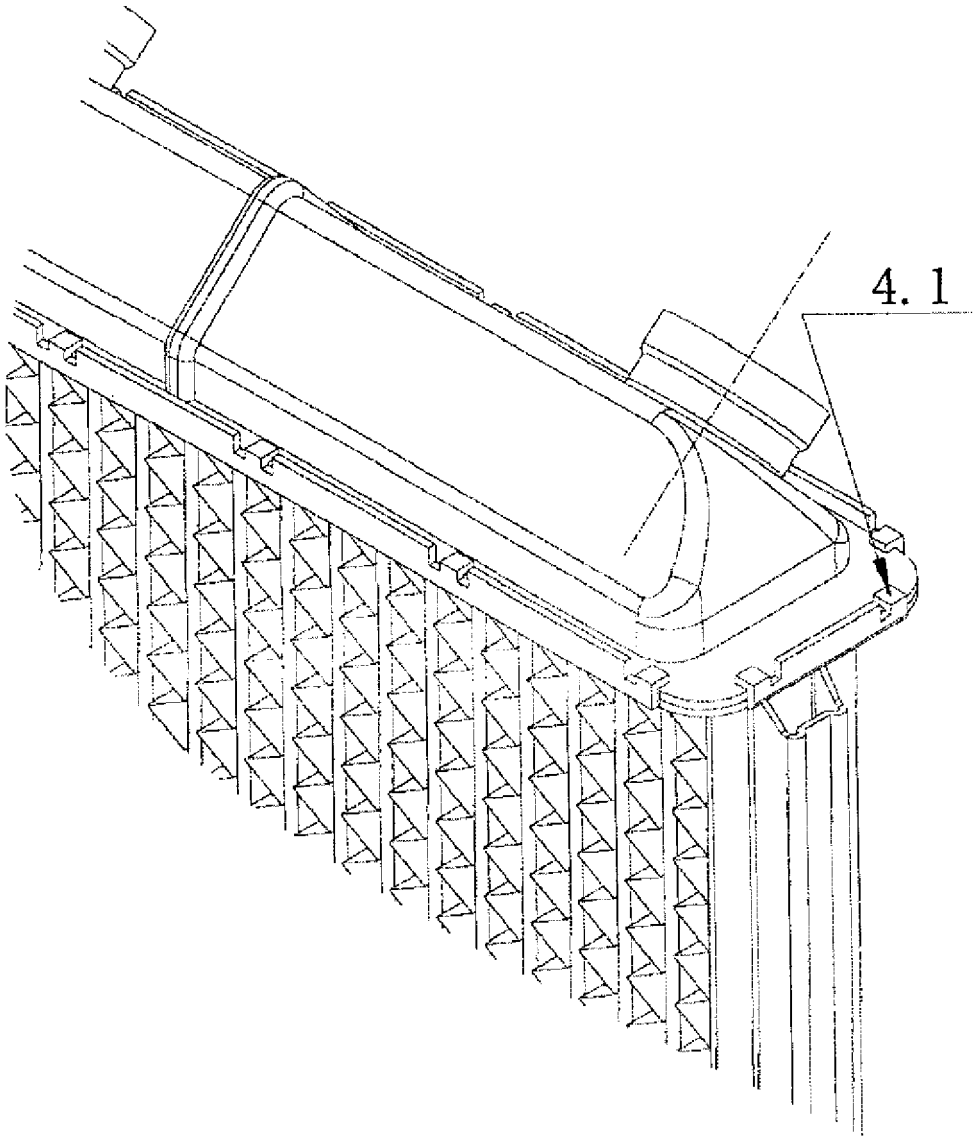


FIG 7



Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 09 15 1647

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2002/157816 A1 (CURTINDALE WILLIAM D [US]) 31 October 2002 (2002-10-31) * the whole document *	1	INV. F28F9/02
X	EP 1 724 546 A (SANDEN CORP [JP]) 22 November 2006 (2006-11-22) * paragraphs [0012] - [0018]; figures 1-8 *	1	
X	US 2006/185833 A1 (BROST VIKTOR [DE] ET AL BROST VIKTOR [DE] ET AL) 24 August 2006 (2006-08-24) * figures 1-7 *	1	
X	US 2005/022968 A1 (WADA NAOKI [JP] ET AL) 3 February 2005 (2005-02-03) * figures 1,4 *	1	
A	EP 1 804 015 A (CALSONIC KANSEI CORP [JP]) 4 July 2007 (2007-07-04) * the whole document *	1	

TECHNICAL FIELDS SEARCHED (IPC)

F28F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	5 May 2009	Leclaire, Thomas

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

& : member of the same patent family, corresponding document

1

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 15 1647

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

05-05-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002157816 A1	31-10-2002	US 2004144526 A1	29-07-2004
		US 2004000397 A1	01-01-2004
EP 1724546 A	22-11-2006	JP 2006322651 A	30-11-2006
US 2006185833 A1	24-08-2006	DE 102005008409 A1	31-08-2006
		EP 1703243 A1	20-09-2006
		ES 2313465 T3	01-03-2009
US 2005022968 A1	03-02-2005	DE 102004016344 A1	28-10-2004
		GB 2401676 A	17-11-2004
		JP 2004308970 A	04-11-2004
EP 1804015 A	04-07-2007	CN 1991285 A	04-07-2007
		JP 2007178053 A	12-07-2007
		US 2007209787 A1	13-09-2007

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82