

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 1 066 909 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
13.04.2005 Bulletin 2005/15

(51) Int Cl.7: **B23G 1/32**, B22D 19/00,
B23C 3/10

(21) Application number: **00830464.4**

(22) Date of filing: **03.07.2000**

(54) **A die-cast aluminium modular radiant element**

Druckgegossenes modulares Heizelement für Radiatoren

Elément de chauffage modulaire coulé sous pression pour radiateurs

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **06.07.1999 IT AN990035**

(43) Date of publication of application:
10.01.2001 Bulletin 2001/02

(73) Proprietor: **Gruppo Ragaini -S.P.A.
60025 Loreto (AN) (IT)**

(72) Inventor: **Ragaini, Stefano
Loreto (AN) (IT)**

(74) Representative: **Baldi, Claudio
Piazza Ghislieri, 3
60035 Jesi (Ancona) (IT)**

(56) References cited:
EP-A- 0 816 791 US-A- 4 761 844
US-A- 5 713 235 US-A- 5 733 078

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 1 066 909 B1

Description

[0001] The present patent application relates to a die-cast aluminium modular radiant element according to the preamble of claim 1, as for example known from EP-A-0 816 791. Such an element is used in combination with identical elements to form the modular radiators that are generally used in thermosiphon heating systems.

[0002] As it is known, modular radiant elements consist in a tubular column externally provided with fins capable of favouring the thermal exchange between the hot water contained in the radiator and the air that touches the external surface of the radiator.

[0003] An opposed pair of threaded hubs is provided on the top and the bottom of each column. Connection nipples are screwed onto the hubs to join the adjacent pairs of radiant elements, as well as to provide communication between the columns of the radiator.

[0004] The purpose of the present invention is to reduce the production cost of the said die-cast aluminium modular radiant elements, by reducing the thickness of some parts of the die-cast piece in order to recover aluminium, melt it and reuse it as die-casting material.

[0005] Since the four hubs of each element need to be threaded, the same machine tool can be used to internally mill the hubs in order to remove and recover the largest quantity of aluminium possible, in compliance with mechanical resistance requirements.

[0006] During milling, the very internal section of the hub is enlarged to obtain a diameter higher than the external threaded opening. The enlargement of the internal ending section of the hub makes threading easier, since the tapping machine can penetrate the hub, ending in the enlarged section. The use of a special tool allows for milling and threading the hub in a sequence, when the tool moves backwards to exit the hub, after penetrating inside it.

[0007] Finally, another advantage of the hub enlargement is represented by the reduction of load losses.

[0008] For major clarity the description of the modular radiant element according to the present invention continues with reference to the enclosed drawings, which are intended for purposes of illustration and not in a limiting sense, whereby:

- Fig. 1 shows the ending section of the modular radiant element according to the invention, sectioned with a plane passing through the axis of the two opposed hubs, in which one hub is milled and threaded and the other hub is in die-cast state.

[0009] With reference to Fig. 1, the modular radiant element according to the invention traditionally comprises a tubular column (1) externally provided with fins (2) capable of favouring the thermal exchange between the hot water contained in the radiator and the air that touches the external surface of the radiator.

[0010] An opposed pair of threaded hubs (3) is provided on the top and the bottom of the tubular column (1). Connection nipples are screwed onto the hubs to join the columns of the radiator, as well as to provide communication between them.

[0011] The modular radiant element according to the invention is characterised in that the threaded opening (3a) of each hub (3) has an internal ending section (3b) with diameter higher than the threaded opening (3a).

[0012] The section (3b) with increased diameter is obtained by placing the die-cast piece in a machine tool to mill the internal section (3b) of the hub (3) and then thread the opening (3a).

Claims

1. A die-cast aluminium modular radiant element for thermosiphon heating systems, of the type comprising a tubular column (1) externally provided with fins (2) and with an opposed pair of threaded hubs (3) on the top and the bottom, **characterised in that** the threaded opening (3a) of each hub (3) has an internal ending section (3b) with diameter higher than the threaded opening (3a).

Patentansprüche

1. Modulares Heizelement aus Aluminiumdruckguss, das in Heißwasserheizanlagen verwendet wird und eine rohrförmige Säule (1) umfasst, die außen mit Rippen (2) versehen ist und an ihrer Oberseite sowie an ihrer Basis ein Paar gegenüberliegender Gewindenaben (3) aufweist, **dadurch gekennzeichnet, dass** im Innern der Gewindeeinmündung (3a) einer jeden Nabe (3) ein Endabschnitt (3b) vorgesehen ist, dessen Durchmesser größer als der Gewindeeinmündung (3a) ist.

Revendications

1. Élément modulaire radiant en aluminium moulé sous pression, à utiliser dans les installations de chauffage par radiateurs, du type comprenant une colonne tubulaire (1), dotée à l'extérieur d'ailettes (2) et présentant, à son sommet et à sa base, une paire opposée de moyeux filetés (3), **caractérisé en ce qu'à** l'intérieur de l'embouchure filetée (3a) de chaque moyeu (3), un segment terminal (3b) de diamètre majeur de celui de l'embouchure filetée (3a) est prévu.

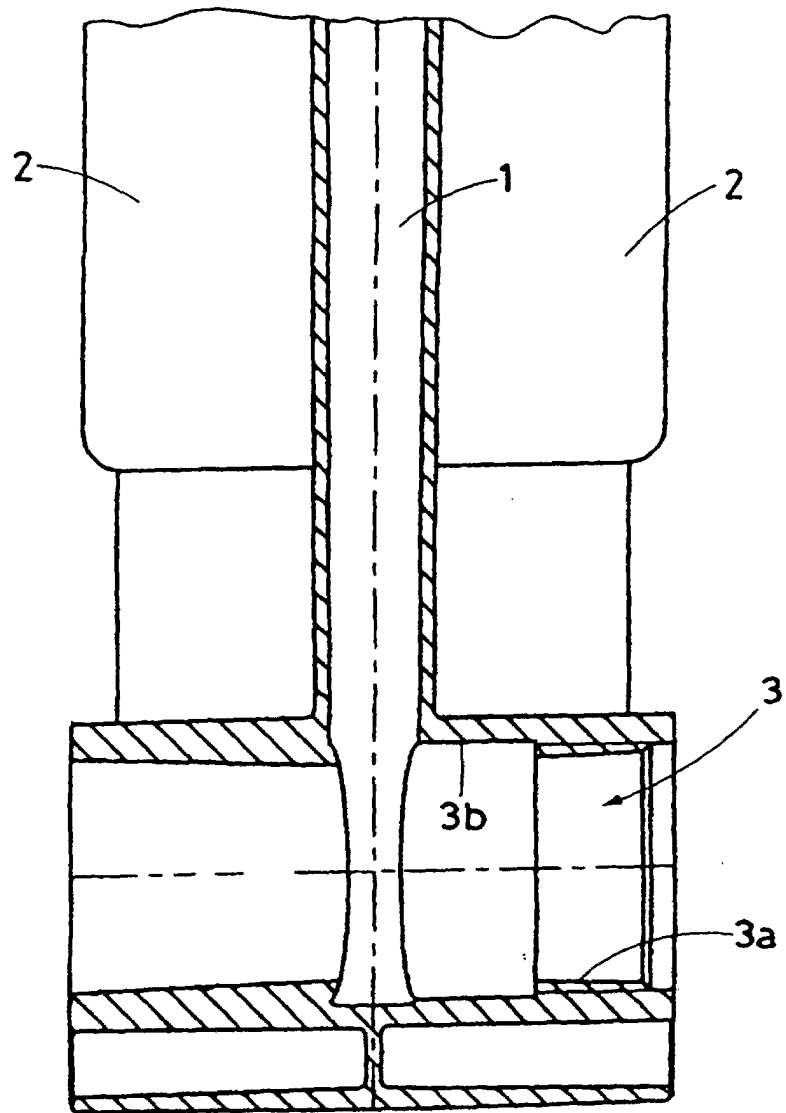


FIG. 1