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(54) Tubular radiator for a central heating system

(57) The finding concerns a tubular radiator for a central heating system, of the type having one or more elements placed alongside one another, each of said elements having two manifolds (1,2), arranged above and below respectively, connected to each other by a plurality of columns (3) within which the fluid flows. Such a radiator is characterized in that the number of the columns (3,3') foreseen at the end(s) visible from outside is higher than the number of the columns at the central part of said element.

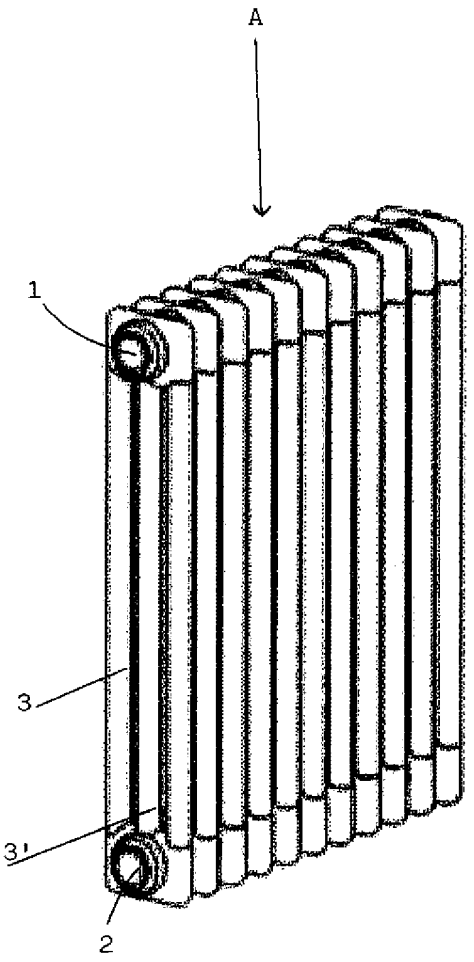

FIG. 1

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Description

[0001] The present finding concerns a tubular radiator for a central heating system, according to the general part of claim 1.

[0002] It is known that most central heating systems use radiators made up of a plurality of elements placed alongside one another; each of said elements has two manifolds, arranged below and above respectively, mutually connected together by a plurality of columns within which the heating fluid flows.

[0003] This constructive configuration is particularly known and used; however, constructive and functional solutions able to make the use of these radiators more practical and effective are continuously sought.

[0004] It is also currently known that tubular radiators of the previously described type are made so that the configuration of each of the elements which are placed alongside one another is identical, for both the elements arranged on the side, and for the elements arranged centrally. Currently, in practice, the elements that make up the radiator are identical not only in terms of the number of columns used, but also in terms of the configurations thereof.

[0005] The purpose of the present finding is that of making a tubular radiator for a central heating system which has a greater thermal efficiency compared to similar radiators of the known type.

[0006] This is obtained, according to the finding, by adapting the radiator according to the characteristics of the characterizing part of claim 1.

[0007] The present finding shall now be illustrated and described in detail, with reference to some of its particular embodiments, given as an example and not for limiting purposes, with the help of the attached drawing tables, where:

- figs. 1 and 2 represent two global perspective views of an element, made according to a first embodiment of the finding, arranged at the side end of the radiator and of an element arranged centrally in the aforementioned.
- figs. 3 and 4 represent two front views of the aforementioned elements.
- figs. 5-8, as well as 9-12, and 13-16 illustrate, two perspective views of an element made according to a second, third and a fourth embodiment of the finding, respectively, arranged at the side ends of the radiator and of an element arranged centrally in the aforementioned, as well as the corresponding front views of said elements.
- figs. 17-24 represent perspective views in which the elements of the odd-numbered figures are arranged at the side ends of the radiator, whereas the elements of the even-numbered figures are located centrally in the aforementioned; all these figures are relative to a further embodiment of the finding, that has a different column configuration from that of the previous figures.

[0008] In fig. 1 it can be seen that the device according to the finding comprises an element A which has above and below it, in a *per se* known way, two manifolds 1 and 2, which are connected together through a plurality of columns 3, within which the heating fluid flows. In this first embodiment of the finding it is foreseen that there are three such columns at the side ends of the element. Vice versa, in the central part of the element, two columns are foreseen; in practice the central column 3' is missing, and it is only present at the end(s) visible from outside of the element A.

[0009] Indeed, tests carried out have made it possible to verify that the heat exchange between the radiator and the air that surrounds it is substantially improved in the case in which there is a certain amount of space between the various columns. However, the users would find the absence of the columns arranged centrally at the visible end of the elements A difficult to accept, essentially for aesthetic reasons. In practice the presence of the central column 3', at the side ends of the element A visible from outside, ensures that the latter looks identical to similar known type devices, whilst still allowing the heat exchange and thermal efficiency improvements that are found when adopting the constructive configuration according to the finding to be obtained.

[0010] It should also be considered that sometimes in a radiator, especially if it has substantial thermal power, a single element is not foreseen, but rather a set of elements arranged side by side. It is obvious that the intermediate elements will have an identical configuration along their entire longitudinal projection, since in this case there is no aesthetic motivation to "fill" their side ends. In practice, the number of columns in the side end (s) visible from outside of the elements arranged at the two side ends of the set of elements which forms the radiator is greater than the number of columns foreseen in the other elements, as well as in the remaining part of the elements themselves.

[0011] Of course, it is also possible to foresee the case of a radiator with limited thermal power in which there is a single element, in this case there will be a greater number of columns at the two ends of the element itself compared to the number of columns at the central part of said element.

[0012] Of course, such a constructive configuration can be applied to any type of radiator, whatever its shape and configuration may be.

[0013] For example, figs. from 1 to 4 illustrate the case of a radiator of the type that, at least aesthetically, appears to have three columns but which, in reality, foresees only two columns;

- figs. from 5 to 8 illustrate the case of a radiator aesthetically appearing to have four columns, but also in reality only having two columns;
- figs. from 9 to 12 illustrate the case of a radiator aes-

thetically of the type appearing to have five columns, but also having in reality only two columns.

[0014] Vice versa, figs. from 13 to 16 illustrate the case of a radiator aesthetically appearing to have six columns, but in reality it is of the four column type. In practice, according to the finding, the central columns of the radiator do not necessarily have to be two in number; vice versa, it is foreseen that centrally there is a lower number of columns than in the visible side parts of the elements themselves.

[0015] Finally, also the configuration of the columns can be different from that previously illustrated. As an example, the radiators illustrated in figs. from 17 to 24 refer to the so called "rolled head" form, of the *per se* known type and widespread on the market. Vice versa, radiators of the previous type, also of a *per se* known shape, concern the so-called "moulded head" form.

[0016] Of course, different embodiments from those illustrated in the figures may be foreseen, without for this reason departing from the scope of the patent.

Claims

1. TUBULAR RADIATOR FOR A CENTRAL HEATING SYSTEM, of the type having one or more elements placed alongside one another, each of said elements having two manifolds (2), arranged below and above respectively, connected to each other by a plurality of columns (3), within which the heating fluid flows, said radiator being **characterized in that** the number of columns foreseen at the end(s) visible from outside is greater than the number of columns (3) present in the other elements, as well as in the remaining parts of the elements themselves.

2. TUBULAR RADIATOR, according to claim 1, **characterized in that** there are two columns (3) foreseen at the central part of the radiator.

3. TUBULAR RADIATOR, according to claim 1, **characterized in that** there are more than two columns (3) foreseen in the non-visible parts of the elements which form the radiator.

4. TUBULAR RADIATOR, according to claim 1, **characterized in that** it has one or more elements in the central position, that are not visible from outside and which have an equal number of columns both at their central parts, and at their side parts.

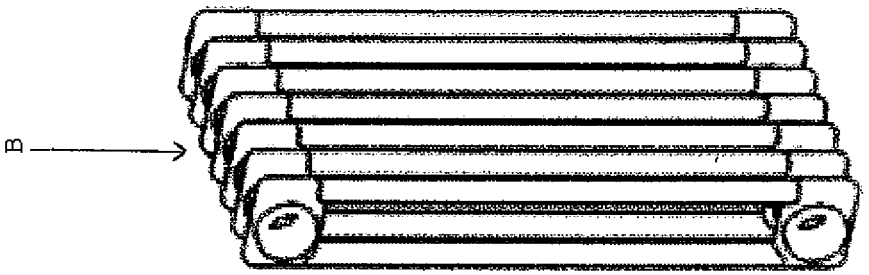

FIG. 2

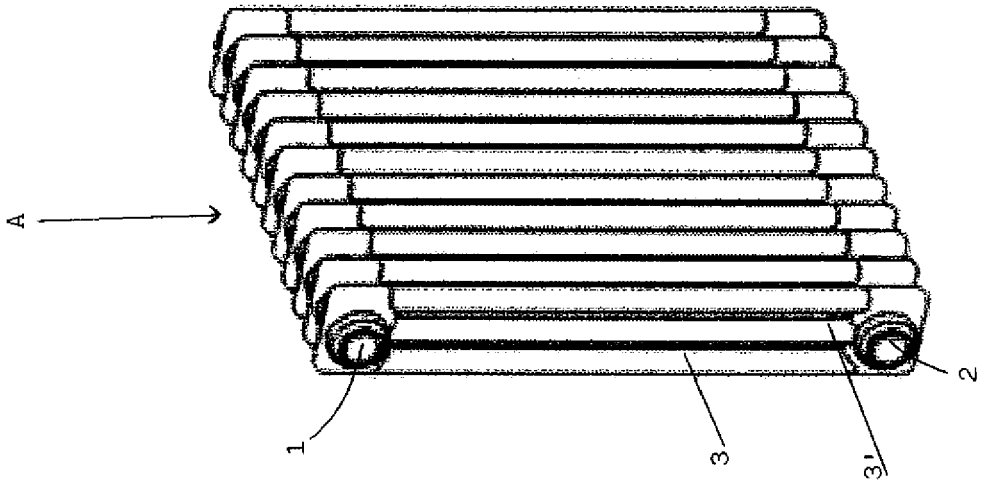

FIG. 1

FIG. 4

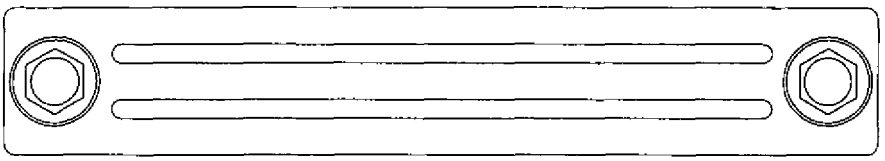

FIG. 3

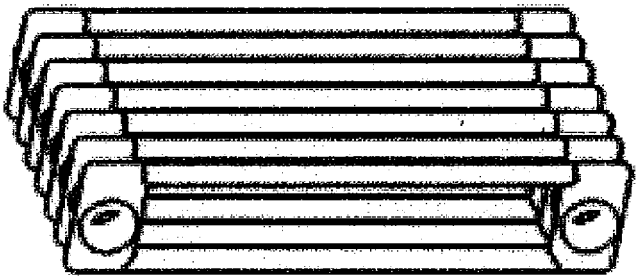

FIG. 6

FIG. 5

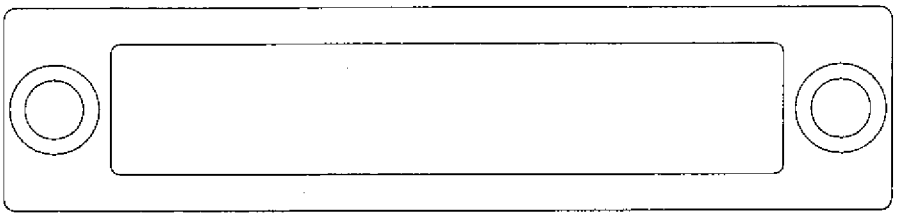

FIG. 8

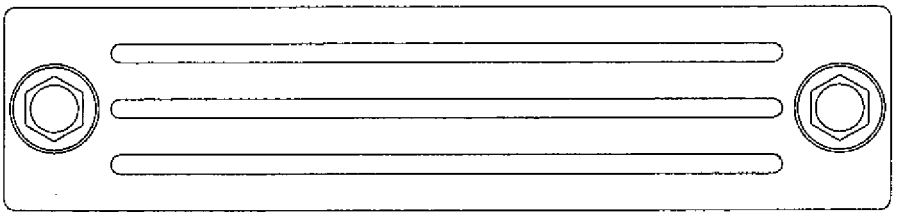

FIG. 7

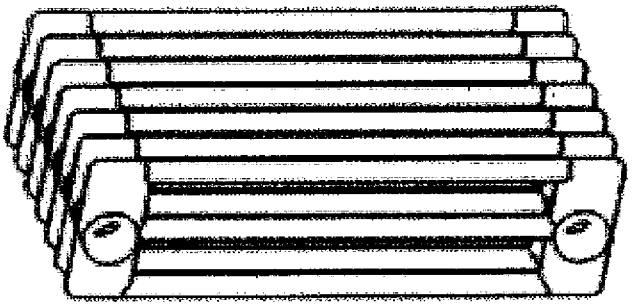

FIG. 10

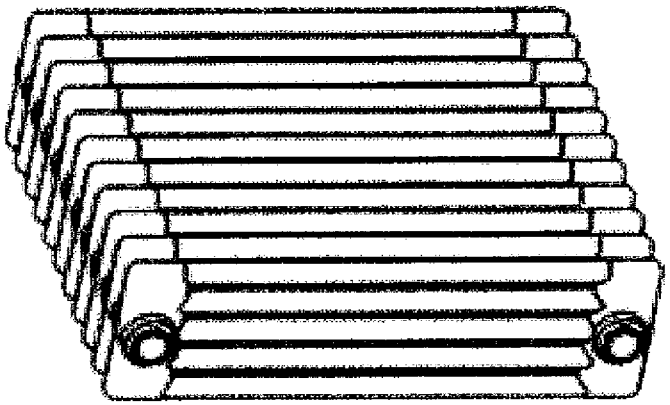

FIG. 9

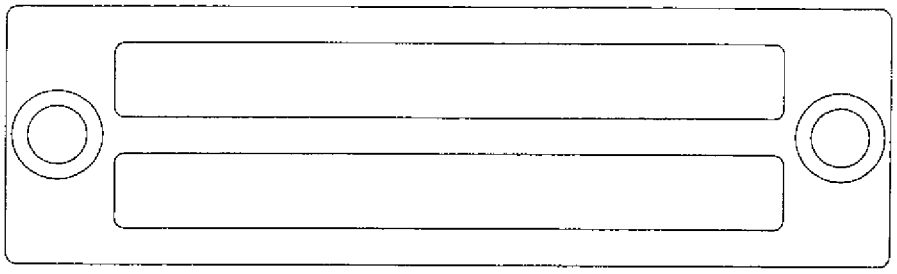

FIG. 12

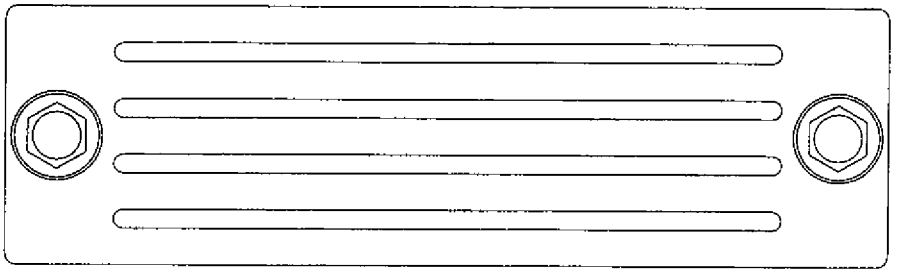

FIG. 11

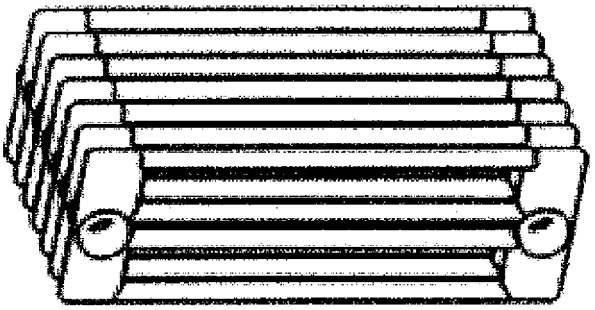

FIG. 14

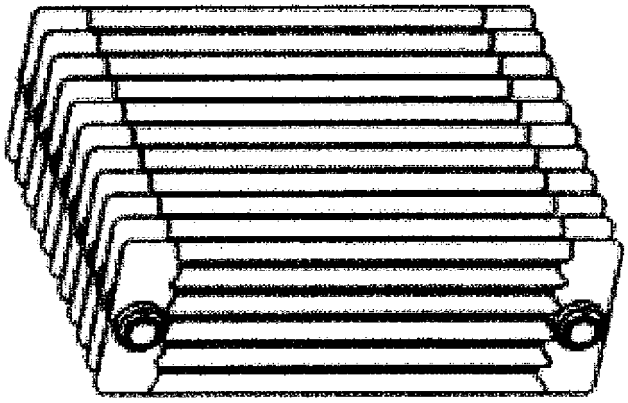

FIG. 13

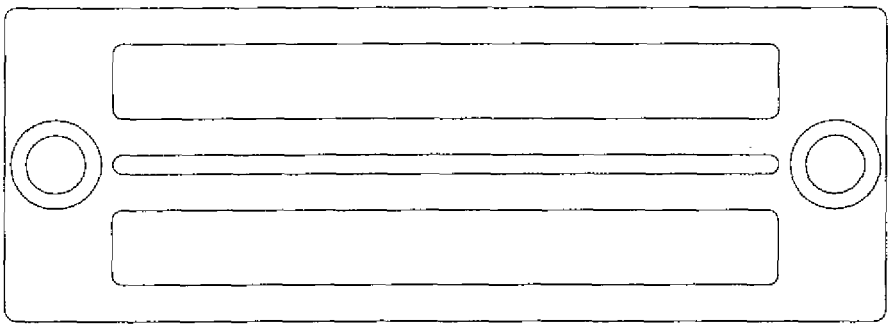

FIG. 16

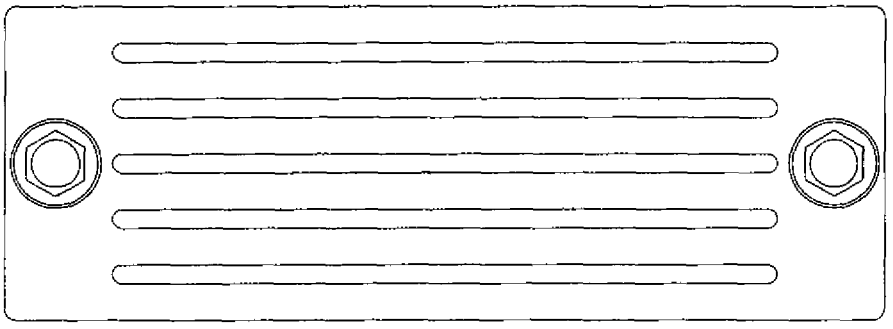

FIG. 15

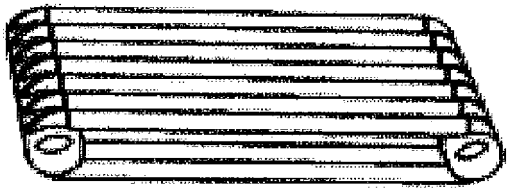

FIG. 18

FIG. 17

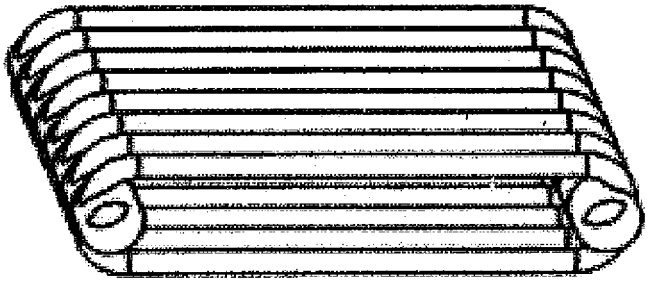

FIG. 20

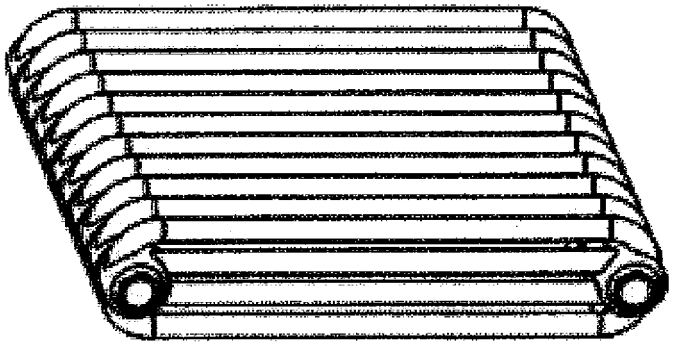

FIG. 19

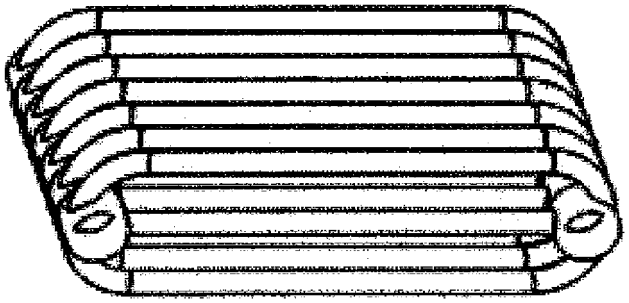

FIG. 22

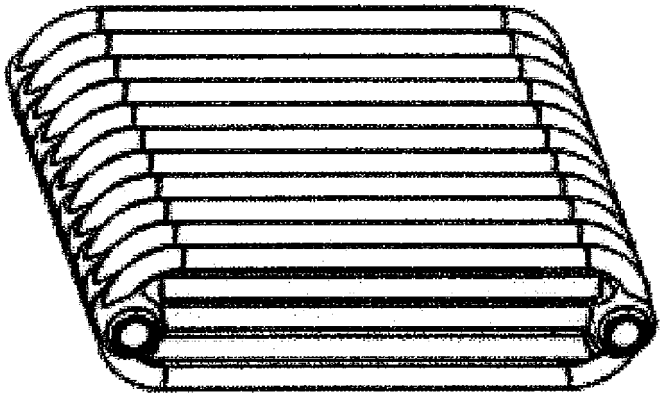

FIG. 21

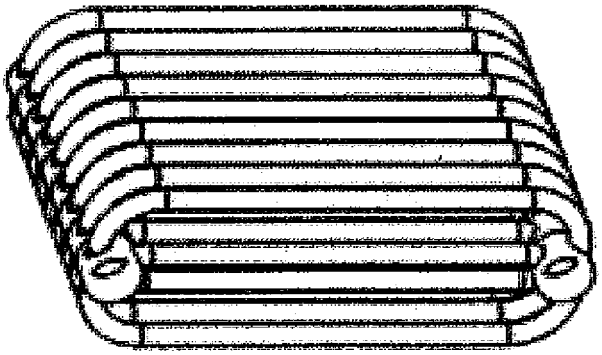

FIG. 24

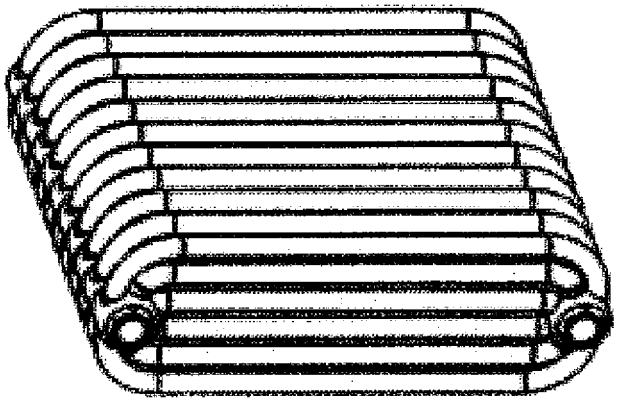

FIG. 23

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EUROPEAN SEARCH REPORT

Application Number
EP 09 16 2673

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	EP 1 939 568 A (RADIATORI TUBOR S P A [IT] RADIATORI TUBOR S P A [IT]; K4B LLC [US]) 2 July 2008 (2008-07-02) * figures 1,2 *	1-4	
A	DE 94 15 857 U1 (BITSCH HANS ULLRICH PROF DIPL [DE]; DIETERLE RICHARD [DE]) 2 November 1995 (1995-11-02) * figures 1-9 *	1-4	
A	GB 2 008 737 A (ANDOLFATTO AGIS RADIATORI) 6 June 1979 (1979-06-06) * figures 1,2 *	1-4	
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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
Munich	4 November 2009	Leclaire, Thomas

CATEGORY OF CITED DOCUMENTS

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