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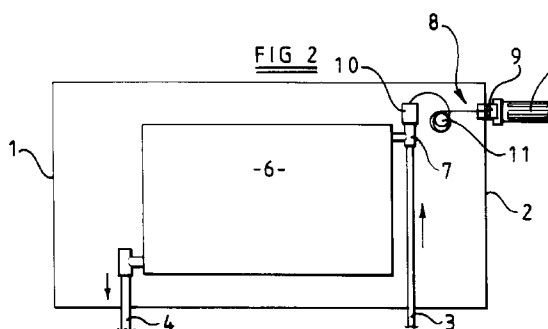
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(54) **Heat radiators.**

(57) A low surface temperature heat radiator 1 comprises a heat emitter 6 contained within an enclosure 2, the enclosure 2 having mounted on it a thermal head 5 of a thermostatic radiator valve, the valve body 7 of which is connected to the heat emitter 6, an extension unit 8 being provided comprising first and second bellows units 9 and 10 interconnected by a coiled capillary tube 11, for interconnecting the thermal head 5 and the valve body 7 (Fig. 2).



This invention relates to heat radiators and more specifically to so-called low surface temperature heat radiators.

The surface temperature of standard central heating radiators can often be as high as 80°C. In everyday use this is not normally a problem. However, should a person fall unconscious on to such a radiator, or is unable to move away from it quickly, unpleasant burns can result, even after a relatively few seconds. In order to overcome this problem so-called low surface temperature radiators are being used. These consist of a normal central heating radiator encased within an enclosure which ideally also encases any exposed pipework and the radiator valve. By this means the temperature of the enclosure can be restricted, typically, to about 40°C maximum. If thermostatic type radiator valves are required to be used with such low surface temperature radiators, it is usually impracticable to directly fit them to the heat emitter within the outer enclosure. Thus remote adjusting or remote sensing thermostatic valves usually have to be used, with the associated fitting and siting disadvantages which they have.

It is an object of the present invention to provide a low surface temperature heat radiator having an integral thermostatic radiator valve.

According to the present invention there is provided a low surface temperature heat radiator comprising a heat emitter encased within an outer enclosure, said heat emitter comprising an adjustable valve for controlling fluid flow through said heat radiator and said enclosure having an adjustable thermostatic radiator valve thermal head mounted on it, coupling means being provided between said valve and said thermal head whereby said radiator valve is operated in dependence upon the temperature and setting of said thermal head.

In a preferred arrangement according to the invention said coupling means comprises a pair of bellows elements interconnected by a flexible capillary tube, one of said bellows elements being associated with said thermal head and the other of said bellows elements being associated with said radiator valve, whereby operation of said thermal head causes said one of said bellows elements to be acted on, and corresponding action of said other bellows element causes said radiator valve to be acted on.

In carrying out the invention it may be arranged that said radiator valve comprises the valve body of a thermostatic radiator valve, in which case said radiator valve may be disposed at one end of said heat emitter, said thermal head being mounted on a corresponding end of said enclosure, or alternatively said radiator valve may be disposed at one end of said heat emitter, said thermal head being mounted on the opposite end of said enclosure.

An exemplary embodiment of the invention will now be described reference being made to the ac-

companying drawings, in which:

Fig. 1 is a perspective view of a low surface temperature heat radiator in accordance with the present invention;

Fig. 2 is a somewhat diagrammatic front cross-sectional view of the heat radiator of Fig. 1; and
Fig. 3 is a view of a thermostatic radiator valve coupling kit for use in the low surface temperature heat radiators of Figs. 1 and 2.

In Fig. 1 of the drawings there is shown a low surface temperature (LST) heat radiator 1 which is normally wall mounted and is connected in a conventional hot water central heating system, the LST heat radiator 1 comprising an enclosure 2 and being connected to flow and return pipes 3 and 4 respectively. As has been mentioned hereinbefore, conventional LST radiators have only been usable with remote adjustable or remote sensing type thermostatic radiator valves which are not appropriate for many applications. In order to overcome this problem the LST heat radiator 1 of Fig. 1 has been fitted with a thermostatic radiator valve (TRV) extension kit, as shown in Fig. 3, which enables the valve head 5 of a conventional manually adjustable TRV to be mounted directly on the enclosure 2 of the LST radiator 1, the valve body of the TRV being mounted on the heat emitter in the usual way, as will hereinafter be explained.

In Fig. 2 of the drawings there is shown a front cross-sectional view of the LST heat radiator 1 of Fig. 1. The LST heat radiator 1 comprises a wall mounted heat emitter 6 which is contained within the enclosure 2 and which is connected to the flow and return pipes 3 and 4 respectively of a conventional hot water central heating system. The heat emitter 6 is connected to the flow pipe 3 by means of the valve body 7 of a conventional thermostatic radiator valve (TRV). The thermal head 5 of the TRV is mounted on the enclosure 2 of the LST heat radiator 1. The valve body 7 and the thermal head 5 are interconnected by means of an extension unit 8, shown in Fig. 3, which comprises a first bellows unit 9 which is mounted through a hole in the side of the enclosure 2 and on which the thermal head 5 is fitted, and a second bellows unit 10 which is mounted on the valve body 7 in place of the valve head 5, the first and second bellows units 9 and 10 being interconnected by a coiled capillary tube 11.

The provision of the extension unit 8 enables the thermal head 5 to be fitted as an integral part of the LST heat radiator 1, and the need for a remote adjustable thermostatic radiator valve is obviated.

It will be appreciated that the thermal head 5 may be mounted at any convenient position on the enclosure 2 and may be at the same end as the valve body 7 as shown in Fig. 2, or it may be at the opposite end as shown in Fig. 1, the coiled capillary tube 11 being unwound as required. Conveniently, half-sheared blanking discs may be provided at both ends of the enclosure 2, and the appropriate blanking disc may

be removed to mount the thermal head 5.

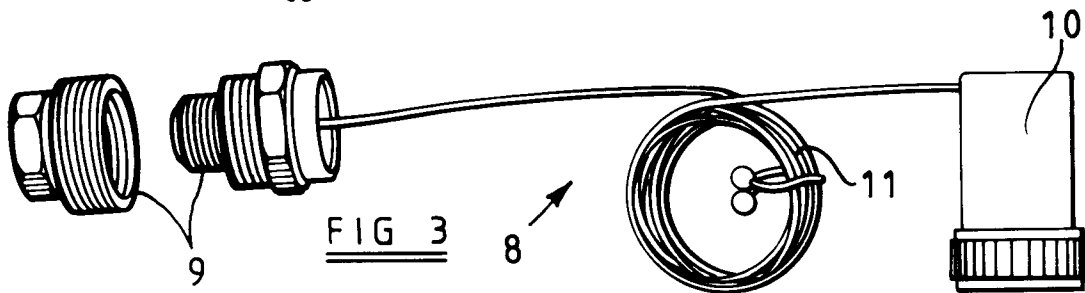
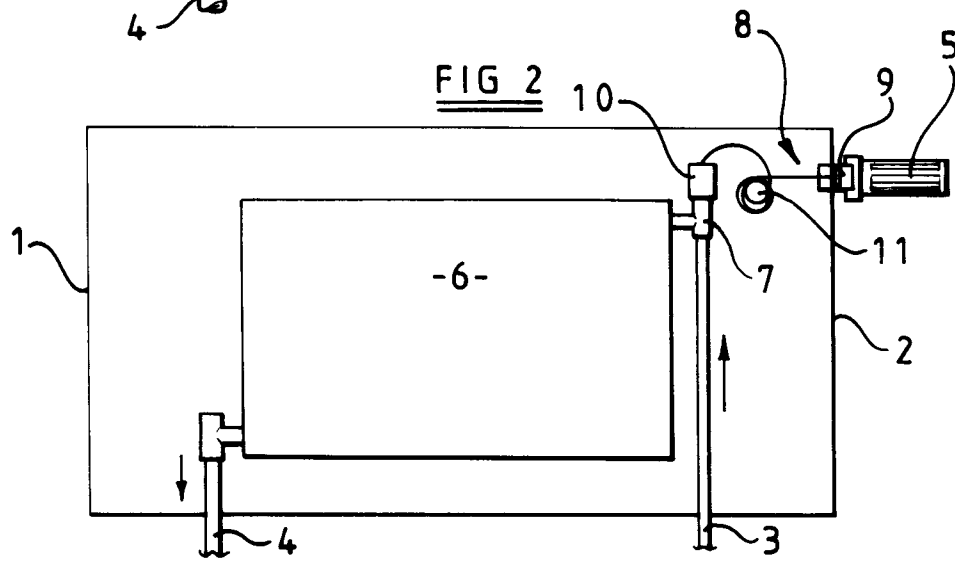
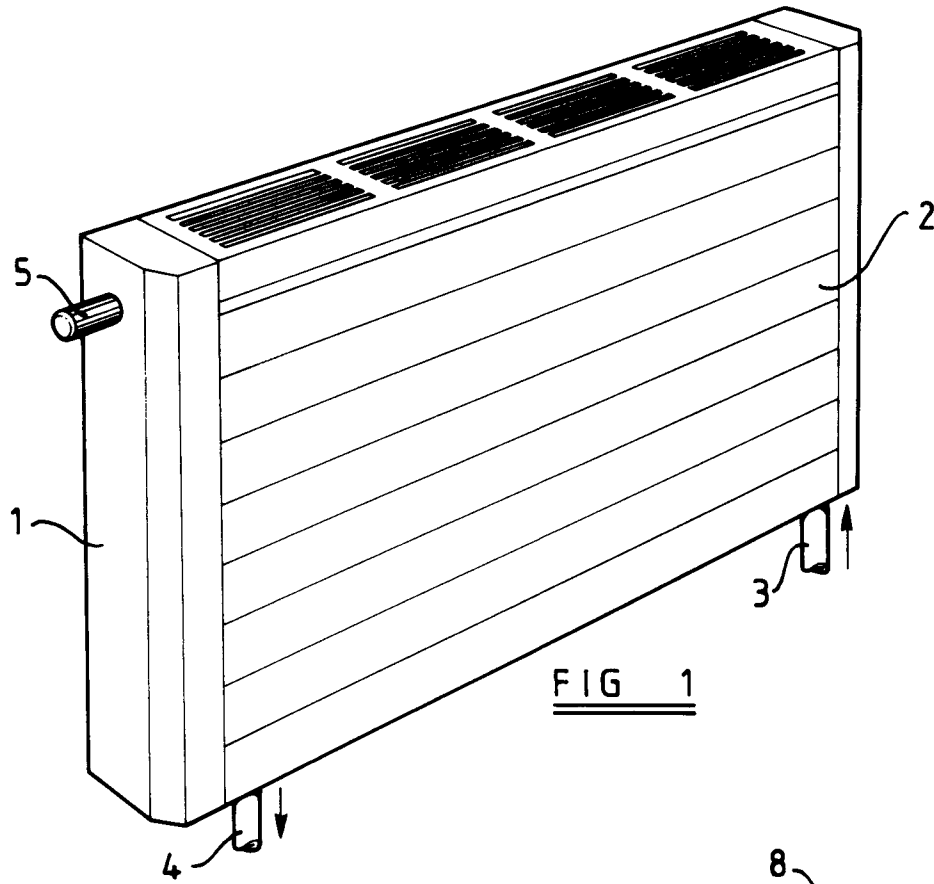
Claims

1. A low surface temperature heat radiator comprising a heat emitter encased within an outer enclosure, said heat emitter comprising an adjustable valve for controlling fluid flow through said heat radiator, and said enclosure having an adjustable thermostatic radiator valve thermal head mounted on it, coupling means being provided between said valve and said thermal head whereby said radiator valve is operated in dependence upon the temperature and setting of the thermal head. 5
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2. A heat radiator as claimed in claim 1, in which said coupling means comprises a pair of bellows elements interconnected by a flexible capillary tube, one of said bellows elements being associated with said thermal head and the other of said bellows elements being associated with said radiator valve, whereby operation of said thermal head causes said one of said bellows elements to be acted on, and corresponding action of said other bellows element causes said radiator valve to be acted on. 20
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3. A heat radiator as claimed in claim 2, in which said radiator valve comprises the valve body of a thermostatic radiator valve. 30
4. A heat radiator as claimed in claim 2 or claim 3, in which said radiator valve is disposed at one end of said heat emitter, and said thermal head is mounted on a corresponding end of said enclosure. 35
5. A heat radiator as claimed in claim 2 or claim 3, in which said radiator valve is disposed at one end of said heat emitter, and said thermal head is mounted on the opposite end of said enclosure. 40

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EUROPEAN SEARCH REPORT

Application Number

EP 92 30 8433

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.5)
X	DE-A-2 500 334 (WERNER KERSTING MONTAGE GMBH) * the whole document * -----	1-5	F24H9/12
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			F24H F24D F16K
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17 NOVEMBER 1992	Examiner VAN GESTEL H.M.
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			

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