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

(11) Publication number: **0 188 892**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **85309159.3**

(22) Date of filing: **16.12.85**

(51) Int. Cl.⁴: **F 24 H 7/04**, F 24 C 15/06

(30) Priority: **14.12.84 GB 8431651**

(43) Date of publication of application: **30.07.86 Bulletin 86/31**

(84) Designated Contracting States: **AT BE DE FR IT NL SE**

(71) Applicant: **DIP LIMITED, Cotmanhay Road, Ilkeston Derbyshire DE7 8LP (GB)**

(72) Inventor: **Hill, Robert, 12 The College, Denby Derbyshire (GB)**

(74) Representative: **Goodman, Christopher et al, Eric Potter & Clarkson 14 Oxford Street, Nottingham NG1 5BP (GB)**

(54) Electrical heaters.

(57) A compact storage and convector or radiant heater in which the storage heating section (10) is positioned at the rear of the heater and the convector or radiant heating section (24) is positioned in the front of the heater to be visible to the user. The convector of radiant heater is preferably provided with a log or coal effect (50) and a forward sloping cowling (66) provides a single heat outlet (60) for both heat sources. The construction comprises a single outer main casing (32) with the cowling positioned on top, the storage heating section being within the main casing in a spaced apart relationship and the radiant or convector heating mounted in the front part of the main casing.

EP 0 188 892 A1

ELECTRICAL HEATERS

The present invention relates to electric heaters and more particularly to electric storage heaters combined with convector or radiant heating.

A storage heater operates by heating a plurality block of heat storage blocks usually by cheap rate electricity at night, the heat so stored being allowed to leak from the storage heater by day to warm the environment within which the storage heater is placed.

A disadvantage of storage heaters is that they are difficult to regulate. If a high capacity storage heater is used then a large amount of heat is stored during the night and the temperature of the environment in the morning may be unbearably high. Also with a high capacity the storage heater is bulky and therefore occupies a large space and tends to be unsightly.

More recently therefore storage heaters have been made smaller with correspondingly lower heat storage capacity. This creates the disadvantage that the heat output during the evening may be insufficient.

It has been proposed (see British Patent No. 1,591,036) to use a storage heater of lower heat storage capacity combined with a convector heater in order to enable the heat output to be boosted during the evening period.

A disadvantage of this type of heater is that it has no aesthetic appeal and therefore tends to be hidden away in the corner of a room. Also if it is desired to use the heater as a convector heater alone the heater is in the wrong place and because it is heavy it is difficult to move. Additionally the placing of the convector elements under the storage block causes the block to absorb some of the instantly required heat output thus causing inefficient operation over a short period.

British Patent No. 1,098,453 provides a combined

storage heater and radiant heater in the form of a simulated conventional domestic fireplace. The storage heating portion comprises two separate sets of heated blocks situated on either side of a recess simulating an open hearth. Radiant heating elements may be mounted within the hearth. The storage heating blocks are arranged as two columns either side of the hearth each column being of substantially square cross section. The disadvantage of such an arrangement is that it is extremely bulky and since the storage section is at the side of the radiant heating section the storage heating section must be provided with a double skin to prevent the extremely high temperature of the storage blocks from being accessible to the user.

It is an object of the present invention to provide a combined electric storage and convector or radiant heater which is aesthetically pleasing, which is efficient in operation and which is economical in construction.

According to the present invention there is provided an electric heater including a storage heating section and a convection or radiant heating section and in which the convection or radiant heating section is mounted in front of the storage heating section.

A log or coal effect is preferably provided in combination with the radiant or convection heating section. The term log or coal effect is for the purposes of the present invention meant to include log or coal and other similar effects. Normally such an effect is provided with flickering means provided for example by a slowly rotating fan mounted above an illumination source e.g. a lamp.

Preferably the storage heating section which is mounted at the back of the heater, comprises one or more heat storage blocks and an electric heating element

situated adjacent the blocks to heat the blocks, the heat storage blocks being mounted within a case which may completely enclose the blocks or may be a frame structure to contain the blocks.

The storage heat and the convection heat generated are preferably emitted through the same outlet. The outlet preferably comprises a cowling with air outlets mounted on the case and extending outwardly from the case to cover the convector heating section.

The log or coal effect is preferably contained within a guarded section which mates with the cowling and with a secondary wall spaced apart from the storage heating case, to provide a complete guard against touching of the storage heating case. This is to ensure that no person can accidentally touch the case surrounding the storage heating blocks which in use is heated to extremely high temperatures.

The guarded section is preferably in the form of one or more sheets of glass to allow virtually unrestricted viewing of the log effect. Alternatively a decorative grille or wire mesh may be used.

The convector heater may preferably be of the elongate rod type and may be situated behind the log effect or above the log effect underneath the canopy.

The storage heating section may be provided with a timer to regulate the "ON" period of the storage heating section to periods of cheap electricity. The convection heating section may be provided with separate ON/OFF switches which are not operative through the timer.

Embodiments of the present invention will now be described by way of example with reference to the accompanying drawing which shows in partial cross-section a perspective view of a combined electric storage and convection heater according to the present invention.

With reference to the drawing the storage heating

section 10 comprises one or more storage blocks 12 and an electric heating element 14 which is "threaded" between the blocks to heat them as uniformly as possible.

The storage heating element may be controlled via a timer 16 to operate only during the time period set by a dial 18. The mains supply 20 to the heater may be split as shown at connector block 22 and the convector heating element 24 may be supplied via ON/OFF switch 26. The timer 16, connector block 22 and switch 26 are shown dotted since they are situated at the end of the heater which has been cross-sectioned to show the internal design.

The convector heater 24 which is shown in a preferred form of an elongate wound bar element is supported by supports 28, 30 on the main frame 32 of the heater. The main frame 32 comprises a rear plate 34 and a flange 36 for standing the heater on the floor. A base plate 38 is preferably spot welded to the rear plate 34 and a side plate 40 (shown dotted) is preferably spot welded to the base and rear plates. The base plate 38 is provided with a downwardly projecting flange 42 which supports the front of the heater.

The storage heating section 10, 12 is contained in a case 44 mounted within the main frame 32 and spaced therefrom by for example heat insulative spacers 46. The case may completely enclose the storage blocks or may be a frame structure which contains the blocks in a desired position. Thus when the storage heater is ON the high temperature transmitted via blocks 12 to the case 44 is not conductively transferred to the outer main frame 32. Thus the outer casing of the heater remains at a substantially lower temperature than that of the case 44.

The convector heating element 24 is preferably in

the position shown at the rear of a log effect unit 50 which comprises a plastic or glass cover 52 shaped and coloured to give the log effect. Illumination of the log effect is provided by one or more electric lamps 54 and "flickering" may be provided by rotatable fan bladed structures 56 mounted above the lamps 54 (only one shown for simplicity).

The log effect 50 is preferably shielded by a glass front plate 60 and side plates 62, 64 and the convector and storage heating sections are covered by a wrap around canopy 66 with holes 68 through which the heat outputs from the convection and storage heating flow. The canopy 66 and plates 60, 62, 64 thus enclose the front of the storage heating case 44 thus preventing any accidental touching of the case 44.

A decorative grill or plain wire mesh can be used instead of glass plates 60, 62, 64 to cover the space left between the canopy 66 and the side plates 40 of the heater. The glass plates 60, 62, 64 may be provided with a fire grate effect 70 and may be secured by corner clips 72 or other suitable means.

The convector heating element 24 may be positioned at 24' as shown under the canopy 66. In this position the log effect 50 is thereby only decorative, the heat output coming from above rather than behind the effect. The heat output will still flow through holes 68 and therefore the overall operation of the heater is unchanged.

The advantage in positioning the convection heating element 24' under the canopy 66 is that the heater may be made slightly slimmer since space is not required behind the lamps 54 for the convector heating element 24.

The log effect cover 52 could be replaced by a coal effect or other display.

A radiant heater may for example be mounted below

or in the centre part of the log effect to provide radiant heat output in addition to or instead of the convection heating. In this case a grille is preferred as a guard to prevent accidential touching either of the radiant heating elements or the case 44 of the storage heater and to allow the radiant heat to emerge. Glass suitably selected for its heat resistant properties may however be used.

CLAIMS

1. An electric heater including a storage heating section and a convection or radiant heating section characterised in that the convection or radiation heating section (24) is mounted in front of the storage heating section (10).

2. An electric heater as claimed in Claim 1 characterised in that the storage heating section (10) is mounted at the back of the heater and comprises one or more heat storage blocks (12) and an electric heating element (14) situated adjacent the blocks to heat the blocks, the heat storage blocks being mounted within an inner case (44) which contains the blocks in a spaced relationship to a main casing for the heater.

3. An electric heater as claimed in Claim 2 characterised in that a log or coal effect (50) is provided in combination with the convection or radiant heating section.

4. An electric storage heater as claimed in Claim 3 characterised in that the main outer casing includes a heat outlet (68) common to both the convector heating element and the storage heating section.

5. An electric heater as claimed in Claim 4 characterised in that the outlet comprises a forward sloping cowling (66) with air outlets (68) mounted on the main outer casing (32) and extending outwardly from the main outer casing (32) to cover the front mounted convector or radiant heating.

6. An electric heater as claimed in Claim 5 characterised in that the log effect is contained within a guarded section which mates with the cowling (66) and the main outer casing to provide a complete guard against touching of the storage heating inner case (44).

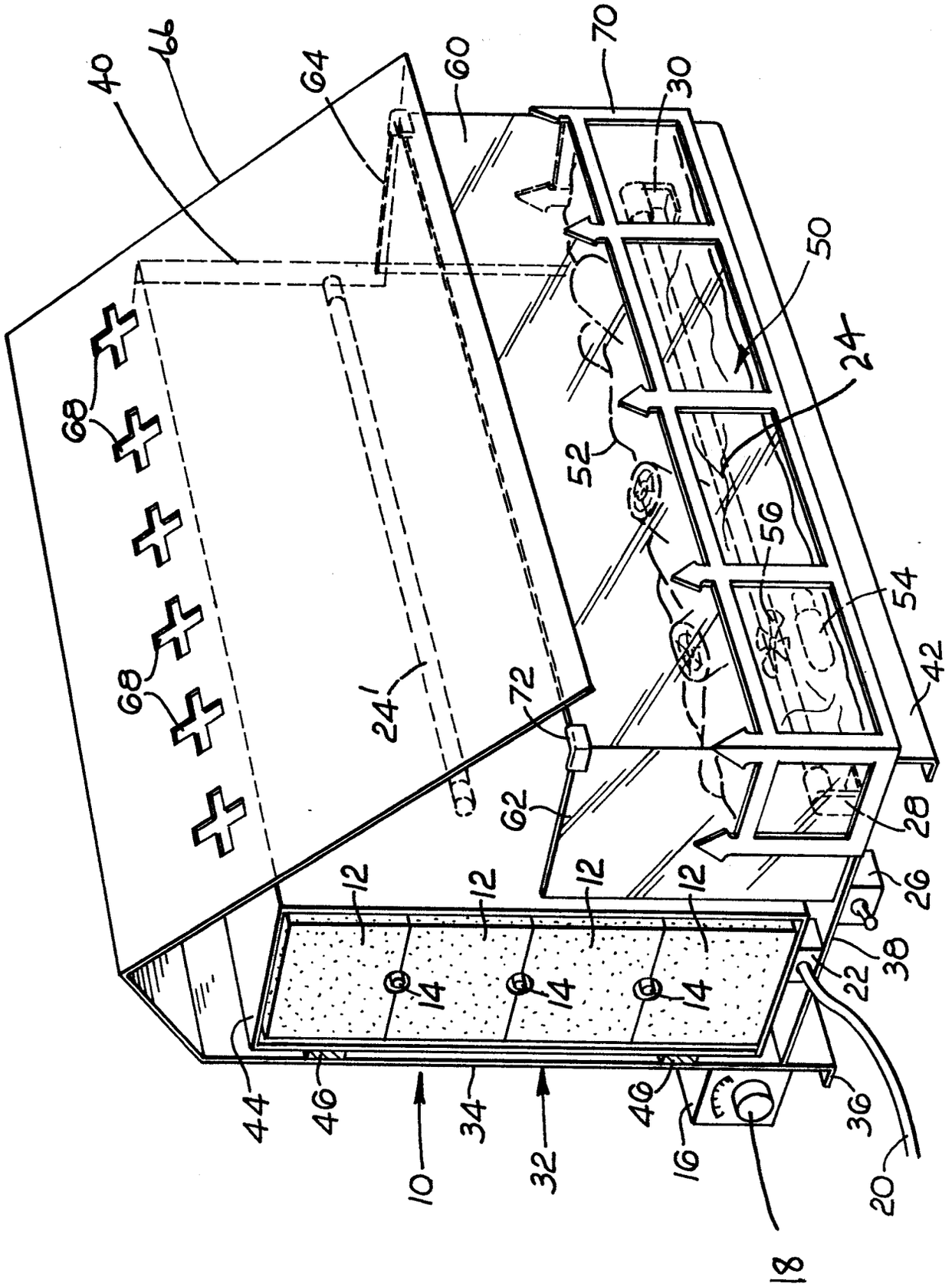
7. An electric heater as claimed in Claim 6 characterised in that the guarded section comprises one

or more sheets of glass (60).

8. An electric heater as claimed in Claim 1 characterised in that the storage heating section includes a timer (16) to regulate the switching on of the section and the convection or radiation heating section includes an ON/OFF switch (26) not operative through the timer.

9. An electric heater as claimed in Claim 3 characterised in that a spinner (54, 56) is provided in the log or coal effect (50), to produce a moving flame effect.

10. An electric heater as claimed in any preceding claim characterised in that the convention or radiant heating section (24) extends substantially across the whole width of the front of the heater.


40
66
64
60
70
30
50
24
52
56
54
42
68
68
24'
72
62
28
26
12
12
12
12
14
14
14
38
22
44
46
34
40
36
10
32
16
20
18

European Patent Office

EUROPEAN SEARCH REPORT

0188892
Application number

EP 85 30 9159

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.4)
X,D	GB-A-1 098 453 (CHATWINS LTD.) * Whole document *	1	F 24 H 7/04 F 24 C 15/06
A		2,3	
A	GB-A-2 020 798 (TI CREDA MANUFACTURING LTD.) * Abstract *	1,2,4	
A	GB-A-1 345 332 (UNITED GAS INDUSTRIES LTD.) * Page 1, lines 79-84 *	6,7,9, 10	
A	GB-A-1 104 886 (HALLIWELL) * Whole document *	1,3	
A,D	GB-A-1 591 036 (SOCIETE PRL) * Figures *	1,2	TECHNICAL FIELDS SEARCHED (Int. Cl.4) F 24 H F 24 B F 24 C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	19-03-1986	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

EPO Form 1503 03 82