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D E C I S I O N
of 14 December 2000

Case Number: T 0039/98 - 3.2.3

Application Number: 91500040.0

Publication Number: 0454613

IPC: F24C 3/10

Language of the proceedings: EN

Title of invention:
Gas appliance

Patentee:
Bertomeu Martinez, Francisco

Opponent:
Bosch-Siemens Hausgeräte GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0039/98 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 14 December 2000

Appellant: (Opponent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 31 October 1997 rejecting the opposition filed against European patent No. 0 454 613 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: C. T. Wilson
Members: J. du Pouget de Nadaillac
M. K. S. Aúz Castro

Summary of Facts and Submissions

I. The appeal is directed against the decision dated 31 October 1997 of an opposition division of the European Patent Office, which rejected the opposition filed against the European patent EP-B1-0 454 613, since according to this decision, the subject-matter of Claim 1, as granted, is new and involves an inventive step vis-à-vis the following prior art cited by the opponent:

D1: JP-A-63-226525

D2: JP-A-63-306311

D3: US-A-3 544 247

D4: DE-B-1 946 588

D5: DE-A-2 315 649

D6: CH-A- 466 883

D7: FR-A-1 249 930

II. Claim 1 of said patent, as granted, reads as follows (some clerical errors are corrected by the board):

"A gas appliance having an instant lighting device (1) with a spark lighter (7), comprising at least one burner, with at least one corresponding magnetic group of safety valves and thermocouples (4) to be heated by the flames of the burner(s) in order to allow gas to be fed to the burner(s) when heated, an electric supply source (8) with storage cell for supplying auxiliary

electric current to the instant lighting device (1) and the magnetic group of safety valve(s), an isolation transformer for supplying electric current to the electric supply source (8), characterised by a printed electric circuit (2) with outlets and a timer (10) for feeding and timing the spark lighter (7) and the auxiliary current to the magnetic group of safety valve(s) and to the thermocouples (4), the said auxiliary current to be replaced by the electrical current generated by them once heated by the flame, by a trigger (6) and a selector (5) for controlling the instant lighting device (1) in order to enable where necessary the supply of gas only to one safety valve at the time so as to prevent the possibility of activating more safety valves at the same time and by the fact that the safety valve shuts off when the corresponding thermocouple cools at a temperature which corresponds to a one third energy reduction of the generated electric current."

III. The opponent (appellant) lodged the appeal and paid the corresponding fee on 9 January 1998. In his statement of grounds received on 10 March 1998, he still objected to the lack of novelty and of inventive step, in particular having regard to the teaching of D1.

IV. Oral proceedings took place on 14 December 2000.

V. The appellant argued as follows:

Starting from the closest prior art known from D1, the object solved by the subject-matter of Claim 1 is to improve the instant lighting device in order to make it more comfortable for the user. According to Claim 1 of the contested patent, this problem is essentially

solved by providing a timer not only for the safety valve as is the case in the device according to D1, but also for the ignition means of the (or each) burner. However, it was well known to simultaneously set off a timer for both the safety valve and the spark lighter of a burner, as shown by the citations D4 and D5:

In the gas appliance according to D4, as soon as the manual button of the burner is actuated, an electric current is supplied through a PTC resistor to the primary coil of the magnetic safety valve, whose secondary coil in turn feeds electric current to the spark lighter. The safety valve is opened and can supply fuel to the burner, and the spark lighter is in operation. As soon as the burner is lighted, the thermocouple is then heated by the flame of the burner and, once sufficiently heated, it provides a current allowing the coils of the safety valve to remain under tension and, thus, the valve to remain open. A flame detector stops the functioning of the spark lighter. When the lighting of the burner does not succeed, then the PTC resistor, the resistance of which increases in time, blocks the circuit after a few seconds and the valve as well as the spark igniter become deenergized. It can be seen that the PTC resistor acts as a timer. The main feature of the solution of the patent in suit, which is the most significant feature of the characterising part of Claim 1, is therefore suggested by this document.

The same applies to D5, in which also a switch actuated by a relay allows the feeding of an electric current to both the safety valve and the ignition means of a burner, and that only during the discharge time of a condensator, which therefore acts as a timer.

The other features of the solution according to Claim 1 of the patent in suit cannot be seen as implying an inventive step: the trigger and the selector for selecting a single safety valve to be activated have no useful application when the gas appliance has only one burner, and moreover it nowadays belongs to the standard measures which are taken when several burners are present. The choice of a level at which a thermocouple becomes ineffective comes within the scope of the customary practices followed by the persons skilled in the art.

Thus, the combination of D1 with either D4 or D5 suggests all the features of Claim 1.

VI. The respondent (patentee) essentially replied as follows:

In the device according to citation D5, there is no thermocouple, so that a combination of D1 with D5 is by itself not obvious. Regarding the disclosure of D4, the timing system and the PTC resistor shown in this prior art cannot be easily combined with the circuit according to D1. This prior art moreover teaches to maintain the contact closed, while in the present invention it is sufficient to push the button once, so that it is much easier to start the system. The age of the citation D4 also pleads in favour of an inventive step.

VII. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

The respondent requested the appeal to be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. The present invention deals with known safety valves used in household appliances running on gasfuel, each valve allowing for the flow of the gas to the burner that it controls. These valves are of the thermoelectric type and utilize electrical energy generated by the heating of a thermocouple, which is heated for example by the flame of the burner itself. However, the thermocouple, once heated, does not by itself provide enough energy (a voltage) to displace the safety valve, it only generates sufficient energy to keep it open, once said valve has before been manually moved in the open position, for example by the manual actuation of a pushbutton of the burner. However, before being able to keep the valve in its open condition, the thermocouple must first be heated by the burner during about 5 to 10 seconds. It implies that during this time the burner is fed by gas. That is to say the electromagnetic safety valve, once actuated by the pushbutton, must remain open although not yet energized by the thermocouple. It also implies that the burner has been lighted by the igniting means. The present invention deals with these problems.

3. None of the documents cited during the opposition proceedings discloses all the features of Claim 1, so that the subject-matter of this claim is new. This was not contested any more by the Appellant.

   Therefore, the only question to be answered is whether this subject-matter involves an inventive step.

4. The prior art closest to the present invention is represented by the citation D1, more exactly by its abstract. This abstract has the following draft:

"**Purpose:** To ensure ignition by burner, prevent the releasing of unburnt gas and to contrive safety, by incorporating a timer circuit continued igniting operation for a predetermined period of time necessary for the ignition of a burner even when the igniting operation is instantaneous, into an igniting circuit. **Constitution**: When a burner 2 is ignited instantaneously by the spark of an igniting circuit 8, a flame detecting device is operated to supply the voltage of a battery 6 to the coil 4b of a solenoid safety valve 1 through a transistor 31 and hold the safety valve 1 in the given time valve opening condition of a first timer circuit 9 while the solenoid safety valve 1 is held in the valve opening condition by the conduction of the coil 4a effected by a predetermined electromotive force from a thermocouple 5 heated by the burner 2 whereby the combustion of the burner is continued. When the burner 2 is not ignited instantaneously by the spark of the igniting circuit 8, a flame rod 28 does not carry current, and a flame detecting circuit 10 is not operated, whereby the voltage of the battery 6 is not supplied to the coil 4b, the solenoid safety valve 1 is closed quickly and the burner 2 may be maintained in the condition of shutt-off."

From above, it can be seen that D1 presupposes that the ignition of the burner is instantaneous. Moreover, it teaches, as is the case in the present invention, to feed by means of a timing circuit the auxiliary current of an electric supply source both to the coil of the

magnetic safety valve and to the thermocouple during the period of time needed by the thermocouple to be sufficiently heated by the flame of the burner, however only once the burner is lighted.

5. The gas appliance according to the patent in suit differs from this prior art in that:

(a) an electric current is supplied to the electric supply source by means of a transformer;

(b) the electric circuit with its outlets is printed;

(c) the timer does not only feed the auxiliary current to both the coil of the safety valve and thermocouple, but also to the spark lighter;

(d) a trigger and a selector are provided for controlling the instant lighting device in order to enable where necessary the supply of gas only to one safety valve at the time; and finally

(e) the safety valve shuts off when the corresponding thermocouple cools at a temperature which corresponds to a one third energy reduction of the generated electric current.

Feature (a) improves the independency of the gas appliance, since the storage cell(s) of the auxiliary electric supply source can be immediately recharged, once discharged. Feature (b) is a mere constructional feature, well-known in the art. Features (d) and (e) make the device more secure. However, Feature (d) is only operational when the gas appliance comprises several burners and therefore is not restrictive, when

the gas appliance according to Claim 1 comprises only one burner. These features (a), (b), (d) and (e) do not relate to the main problem to be solved by the present invention, as will be explained in the following paragraph. Therefore, what essentially follows concerns feature (c), which is the significant distinguishing feature of Claim 1 and whose inventiveness was the main issue discussed during the oral proceedings.

6. The present invention aims at improving the comfort of the user of the gas appliance. This was recognised by the appellant during the oral proceedings before the board. From Claim 1 and the drawing as well as the practical example provided in column 2, line 57 in the description the person skilled in the art understands that, with the invention, it is only necessary to press the control knob (or pushbutton) of a safety valve of the thermoelectric type in order to displace the safety valve into its open condition and then to release it; it is no more necessary to continuously hold the control knob down in order to keep the safety valve open. In the patent in suit, the comfort of the user is therefore to be understood as an easier use of the pushbutton of the burner, which actuates the safety valve of the burner, and, according to Article 69 EPC, the solution of Claim 1 can only be understood in the context of this practical problem, even if Claim 1 as such does not mention a safety valve of the disclosed type with a pushbutton.

7. As far as feature (c) is concerned, the appellant in his written submissions has argued that the first lines of the abstract of D1 disclose or at least suggest to provide a timing of the ignition means. In the board's opinion, such an interpretation of these lines can only

be made with hindsight, that is to say with the knowledge of the present invention. D1 in these lines indeed refers to the "period of time necessary for the ignition of the burner". However, having regard to the whole content of the abstract of D1, it appears that these terms are not to be considered as concerning the lighting as such of the burner, especially as D1 as seen above presupposes an instantaneous lighting. The paragraph "Constitution" of the abstract shows that, in fact, these terms concern the following period during which, being fed by gas, the burner is maintained in its lighted condition so as to sufficiently heat the thermocouple. As already explained, D1 teaches to set off the timer for the supply of the auxiliary current only once the burner has been lighted. Thus, a timing of the ignition means in the meaning of the present invention, that is to say - according to Feature (c) - a timing of the spark lighter itself, is not suggested by D1.

It is also observed that D1 does not tackle the problem underlying the present invention. D1, in fact, provides no information as to the way the safety valve is brought into its operative position. The single figure seems to indicate that it is a contact which is merely shut to provide the auxiliary current, starting thereby the gas appliance. There is no disclosure of a control knob, which has a double function, namely to start the gas appliance and simultaneously to displace the safety valve. This idea of such a double use of a pushbutton, implicitly included in the above definition of the problem to be solved, is to be considered as a part of the invention.

8. Document D4 concerns a single gas burner provided with

a magnetic safety valve, ignition means and a thermocouple. A positive temperature coefficient (PTC) resistor and, in parallel thereto, a contact relay, which can be energized by the thermocouple, are located in the electric circuit of the primary coil of the safety valve, whereas the ignition means is located in the secondary coil circuit of the magnetic valve. By closing a contact, the mains current is fed through the PTC resistor to the primary coil, which displaces the safety valve in its open state and thus provides gas to the burner, which can be lighted by the ignitions means energised by the current of the secondary coil. However, the PTC resistor is progressively heated and thus its resistance increases, so that after a certain period of time the circuit would normally be broken. Before this happens, the ignition means has normally lighted the burner, the thermocouple is heated and, in turn, actuates the contact relay, closing the line parallel to the PTC resistor line, so that the mains current can continue to energise the primary coil of the safety valve, which remains open. Ionization means stops the functioning of the ignition means as soon as the burner is lighted.

In this prior art, the PTC resistor acts as a timer, since, after a predetermined time, if the lighting of the burner does not succeed or fails, it cuts the supply of the electric current to the magnetic valve, closing it and at the same time stopping the spark lighter. It is, therefore, a timer which feeds current both to the safety valve and to the spark lighter, as soon as the main contact of the electric circuit is closed.

9. A person skilled in the art, who, starting from D1,

looks for a solution to the problem defined in point 6 above, has no reason to consider this prior art D4, since it neither shows, nor gives the idea of, a pushbutton which actuates the safety valve. As seen above, in the gas appliance according to D4, the primary coil of the magnetic valve, once provided with the mains current, is able to open by itself the valve and therefore differs from the magnetic valve of the present invention. Moreover, this prior art relies only on the mains current, whereas the present invention, by using initially the current of an electric supply source comprising cell(s) and then the current supplied by the heated thermocouple, is based on the idea of replacing one current by the other and aims at providing a gas appliance which is independent of the electrical energy from the mains current, using electric currents with low operating voltages. In D4, by comparison, the heating of the PCT resistor and the use of the secondary coil of the safety valve as transformer for the ignition means require large amounts of electrical energy, which do not correspond to the capacity of the kind of an electrical supply source made of cell(s) utilized in domestic gas appliances. Thus, the problems to be solved are different.

Further, a comparison of the electrical schemes of D1 and D4 shows that they cannot be combined. The thermocouple according to D4 has a function different from that of D1 or of the present invention, since it merely keeps open a derived circuit for the mains current by activating a relay of the primary coil of the safety valve. By contrast, the heated thermocouple according to D1 directly provides electrical energy to the secondary coil of the safety valve. It moreover

follows that the secondary coil cannot be used to provide energy to the ignition means, as is taught in D4. There are therefore incompatibilities between the solutions of D1 and D4.

10. Document D5 is less relevant, since it does not concern a gas appliance based on the use of a thermocouple and, as in the device according to D4, it utilizes the mains electrical current, which opens the safety valve, and also a mere electrical contact (thermostat contact) to start the functioning of the gas appliance, so that the comments made above for D4 apply also to D5. Moreover, the problem tackled by this prior art is to provide different adjustable and precise timing periods respectively for the fan, which prior to the lighting of the burner exhausts all dangerous gases, and then for the ignition means and safety valve, which are only energized after the cleaning work of the fan. The main idea of this prior art is therefore to provide, as soon as the electrical contact is closed, two adjustable timing periods, which follow each other immediately and both concern the feed of the same electrical current to different devices of the gas appliance. This process does not correspond to the solution of D1 and, more particularly to the solution of the present invention, in which, as soon as the pushbutton is actuated, a timer feeds and times the spark lighter and the **auxiliary current** to the magnetic group of the safety valve, until this auxiliary current **is replaced** by the current generated by the heated thermocouple. There is no dependency on a previous timing period. Thus, the solution of D5 cannot be combined with that of D1 and does not suggest the solution of the present invention as claimed.

11. The selection of a particular feature of either D4 or D5 by the appellant, namely the simultaneous timing for the spark lighter and for the magnetic valve, this selection being made out of the whole contexts of these prior arts and moreover in a context unrelated to the problem solved by the present invention, is therefore to be considered as the result of hindsight.

12. In conclusion, the arguments of the appellant are not followed and the subject-matter of Claim 1 of the patent in suit involves an inventive step, so that the requirement of Article 56 EPC is satisfied. The same applies to Claims 2 to 4 which are dependent on Claim 1 and concern further embodiments of the invention.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

A. Counillon C. T. Wilson