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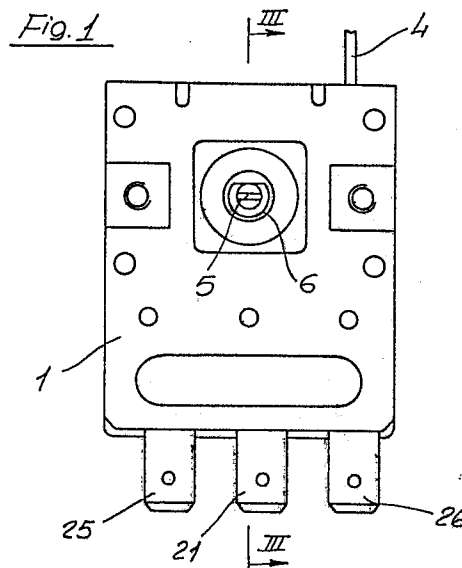
71 Applicant: **PRODIGY ITALIANA S.R.L.**  
Via Manzotti, 16  
I-20158 Milano (IT)

72 Inventor: **Pollina, Antonio**  
Prodigy Italiana S.r.l. Via Manzotti 16  
I-20158 Milano (IT)

74 Representative: **Cicogna, Franco**  
Ufficio Internazionale Brevetti Dott. Prof. Franco Cicogna  
Via Visconti di Modrone, 14/A  
I-20122 Milano (IT)

54 **Thermostat for controlling the operation of apparatus in general.**

57 The thermostat comprises a box-like casing (1) including an expansible plenum member (3) coupled, through a capillary element, to a probe holding an expansible liquid, the plenum member being arranged between an adjustment abutment member (5) and an operating lever (7) which at one end thereof acts on a resilient blade (15) supporting a movable contact (20) coupled to the apparatus electrical input and effective to be selectively contacted both with a first (23) and a second (24) fixed contact .



**Description****THERMOSTAT FOR CONTROLLING THE OPERATION OF APPARATUS IN GENERAL**BACKGROUND OF THE INVENTION

The present invention relates to a thermostat for controlling the operation of apparatus and devices in general.

As is known, in several types of apparatus based on thermal cycles, there are presently used thermostats for controlling the operation of said apparatus which use, as a responsive element, an expansible plenum chamber, coupled to a probe member, containing a liquid and which changes its operating volume as the temperature changes.

In known thermostats, or thermal switches, there are remarkable constructional drawbacks because of the large size elements required for exploiting the volume variations of said expansible plenum chamber, which negatively affects the production cost of the thermostat itself.

Another drawback of known thermostatic assemblies is that the electric thermostatic elements have a comparatively large size and, moreover, are scarcely reliable.

SUMMARY OF THE INVENTION

Accordingly, the task of the present invention is to overcome the above mentioned drawbacks, by providing a thermostat for controlling the operation of apparatus and devices in general which is so designed as to quickly respond to the temperature variations.

Within the scope of the above mentioned task, it is a main object of the present invention to provide a thermostat for controlling the operation of apparatus in general which is of very reduced outer size and very simple construction-wise.

Yet another object of the present invention is to provide such an electric thermostat which can be made by a very reduced number of component elements susceptible to be easily and quickly assembled and which, owing to its constructional features, is very reliable in operation.

According to one aspect of the present invention, the above mentioned task and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a thermostat for controlling the operation of apparatus in general, characterized in that it comprises a box-like casing including an expandible plenum member coupled, through a capillary element, to a probe containing an expansible liquid.

More specifically, the mentioned plenum member or chamber is arranged between an adjusting abutment and an operating lever which, at one end thereof, acts on a resilient blade supporting a movable contact coupled to the electrical input.

This movable contact, under the control of the resilient blade, can be selectively contacted both with a first and a second fixed contacts which are coupled to the electrical output.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed description of a preferred embodiment of a thermostat for controlling the operation of apparatus and devices in general and which is illustrated, by way of an indicative example, in the figures of the accompanying drawings, in which:

figure 1 is a front view illustrating the thermostat according to the present invention, the control knob of which has been removed;

figure 2 is a rear elevation view of the thermostat;

figure 3 is a cross-sectional view of the subject thermostat, taken along the line III-III of figure 1;

and figure 4 is a cross-sectional view of the thermostat according to the present invention taken along the line IV-IV of figure 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the figures of the accompanying drawings, the thermostat for controlling the operation of apparatus and devices in general according to the present invention comprises a box-like casing or body, consisting of a supporting casing 1 thereto can be snap coupled a closure cover 2 which is preferably made of a plastics material.

Inside the mentioned box-like body there is housed an expansible plenum member 3 which is coupled, through a capillary element 4, to a probe, not shown in the drawings, and provided for holding a liquid the volume of which is susceptible to vary depending on the temperature.

More specifically said probe is arranged near the region the temperature of which is to be controlled, in order to control the operation of the related device or apparatus.

The mentioned expansible plenum member, in particular, is arranged, on a side, near an abutment member 5 operating as a calibrating member and is mounted inside an adjusting stem 6 coupled to the apparatus control knob, for setting the desired operating temperature, and which has not been shown in the drawing.

At its opposite face, said expansible plenum member 3 acts on the leg 7, forming an operating lever, of a bracket element 8 which, by its other leg, is coupled to the closure cover 2, at the affixing region of a small spring 9 holding in its position a washer 10 coupled to said adjusting stem 6.

More specifically the mentioned operating lever 7 is made of tempered steel and, at its free end, it supports a ceramics pad 12 contacting a resilient blade 15 which is supported by a fork member 17 coupled to the casing 2.

In particular, the resilient blade 15, at the region thereof supported between the legs of the fork

member, is provided with a projecting boss 18 thereon the pad 12 acts.

At its free end, the resilient blade 15 supports a movable contact 20, which is electrically coupled to the electric input 21.

Moreover said blade 15, at its middle portion, is provided with a loop portion which, depending on the pressure exerted on the bent portion 18, causes the movable contact 20 to be displaced.

The movable contact 20, moreover, may be selectively contacted both with a first fixed contact 23 and with a second fixed contact 24 which fixed contacts are respectively coupled to output pins 25 and 26 accessible from the outside of the box-like casing.

The resilient blade 15 is preferably made of copper and berillium, whereas the movable and fixed contacts are made of silver so as to provide very good electrical contact conditions.

In operation, as the expansion of the plenum member 3 changes, the action exerted by said plenum member on the operating lever will vary; then said operating lever will bring its end provided with said ceramics pad to contact the resilient blade 15, thereby causing the movable contact 22 to contact either the first or the second fixed contact depending on the position assumed by the resilient blade.

Thus it will be possible to adjust or set the thermostat so as to cause the apparatus to operate, that is the variation of the position of the movable contact, for a preset temperature value.

The present temperature value causes a position variation of the abutment member 5, which is obtained by means of the variation of the position of the adjusting stem 6 which, in actual practice, will vary the contact force between the abutment member 5 and the expandible plenum member 3 and, accordingly, the pushing force exerted by said plenum member 3 on the operating lever 7.

From the above disclosure it should be apparent that the invention fully achieves the intended task and objects.

In particular the fact should be pointed out that the thermostat according to the present invention, of very reduced size and including a very reduced number of component elements, is very reliable in operation, both owing to the constructional accuracy and the very reduced number of component parts.

A nother great advantage provided by the thermostat according to the present invention is that it can be easily and quickly calibrated.

In practicing the invention the used materials may be any according to requirements.

## Claims

1- A thermostat for controlling the operation of apparatus in general, characterized in that it comprises a box-like casing including an expandible plenum member coupled, through a capillary element, to a probe holding an expandible liquid, said plenum member being arranged between an adjustment abutment mem-

ber and an operating lever which at one end thereof acts on a resilient blade supporting a movable contact coupled to the electrical input, said movable contact, under the control of said resilient blade, being effective to be selectively contacted both with a first and a second fixed contact which are coupled to the electrical output.

2- A thermostat according to the preceding claim, characterized in that said box-like casing consists of a metal casing supporting the electric circuitry and a plastics material cover adapted for snap coupling to said metal casing.

3- A thermostat according to the preceding claims, characterized in that said adjustment abutment member consists of an abutment member supported by an adjusting stem.

4- A thermostat according to one or more of the preceding claims, characterized in that said operating lever supports, at its end operating against said resilient blade, a ceramics pad.

5- A thermostat according to one or more of the preceding claims, characterized in that said resilient blade is supported by a fork member coupled to said casing, said resilient blade, at the region thereof between the legs of said fork member, being provided with a bent portion thereon said ceramics pad acts.

6- A thermostat, according to one or more of the preceding claims, characterized in that said resilient blade, at the region thereof outside of said fork member, is provided with a loop portion for the switching oscillation, exerted, depending on the pressure force, on said bent portion of the ceramics pad.

7- A thermostat according to one or more of the preceding claims, characterized in that said resilient blade is made of berillium copper.

8- A thermostat according to one or more of the preceding claims, characterized in that it comprises contact pins which are respectively coupled to the movable contact and fixed contacts, said pins being accessible from the outside of said box like casing.

9- A thermostat for controlling the operation of apparatus in general, according to the preceding claims, and substantially as broadly disclosed and illustrated for the intended objects.

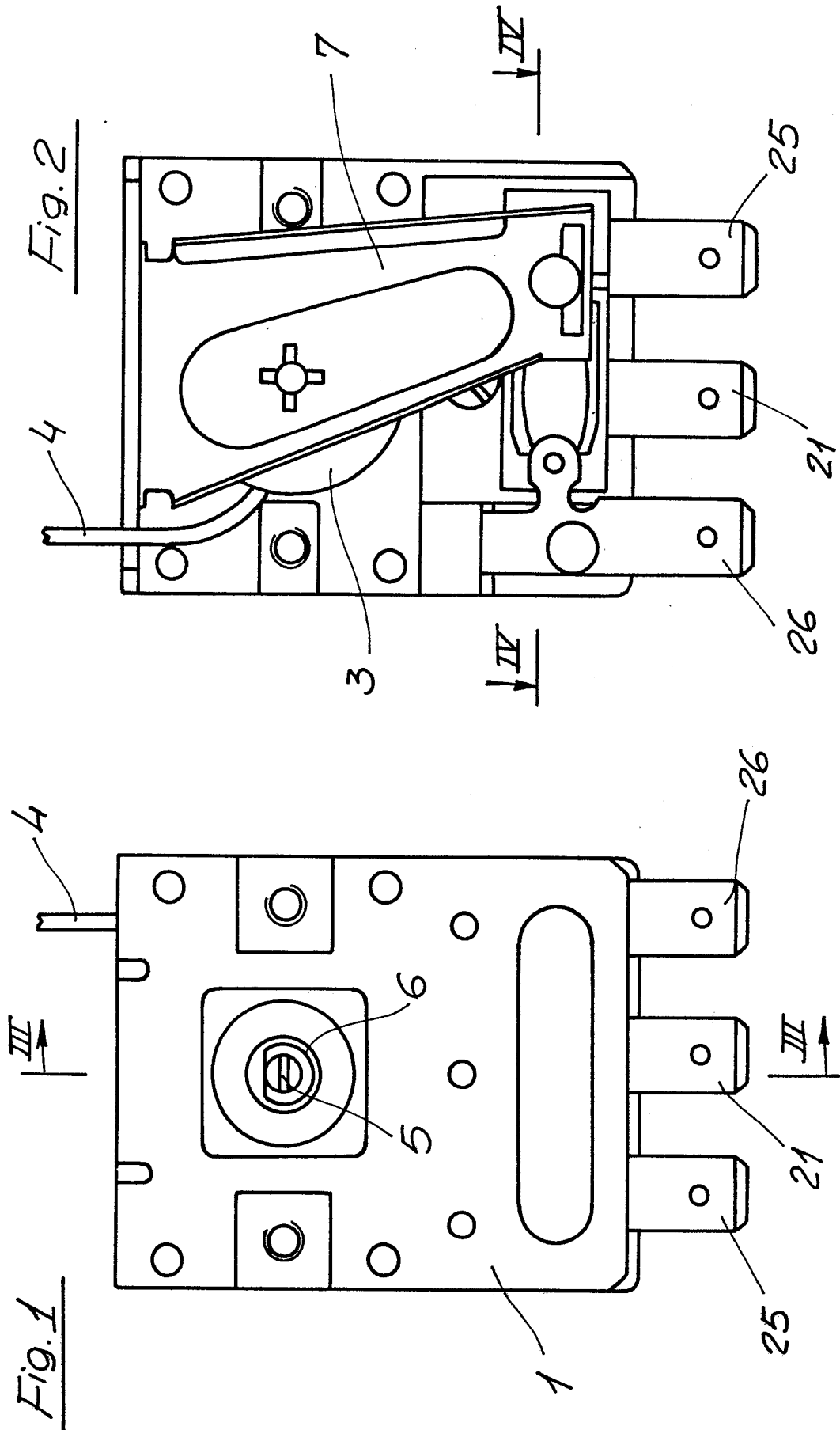


Fig.3

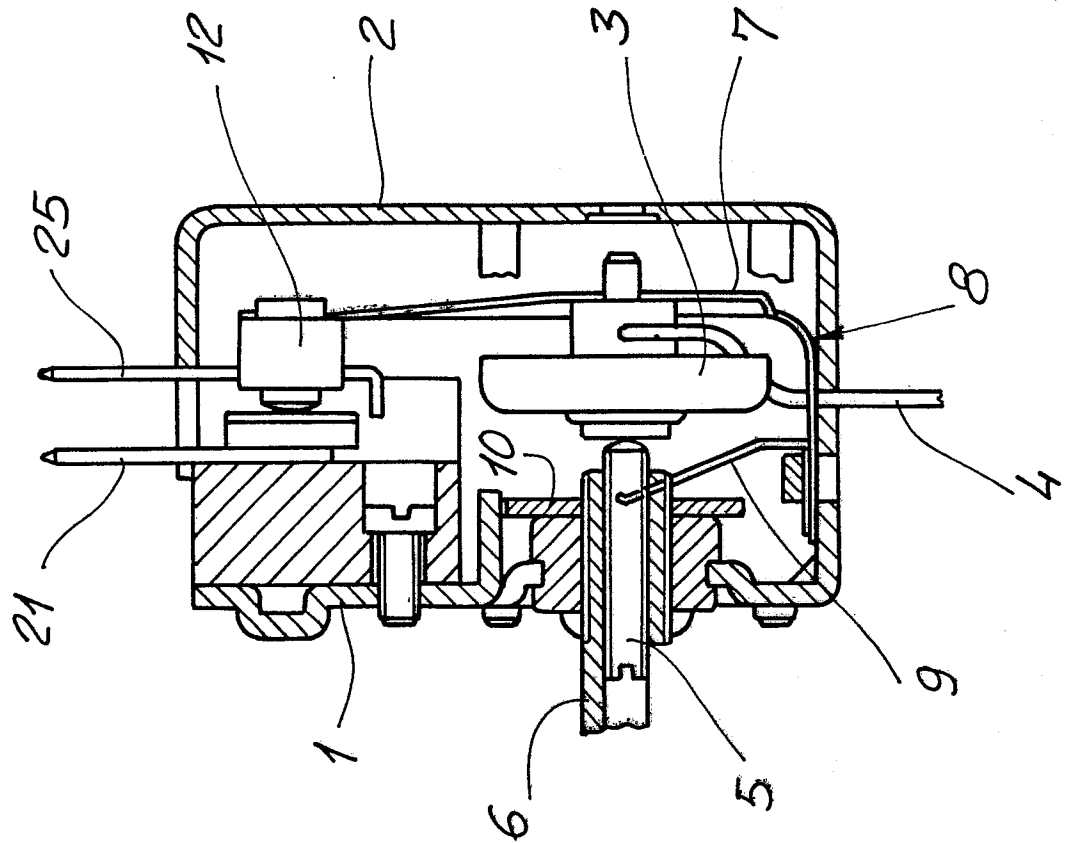


Fig.4

