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(54) Reflex pyrometer sighting

(57) An infra-red pyrometer has an internal optical element, e.g. a mirror 3, which allows the pyrometer line of sight to be angled with respect to the principal optical (or mechanical) axis, without the need for an external mirror. Light focussed onto a field stop 2 is directed to a detector 6 by a fibre optic cable 5.

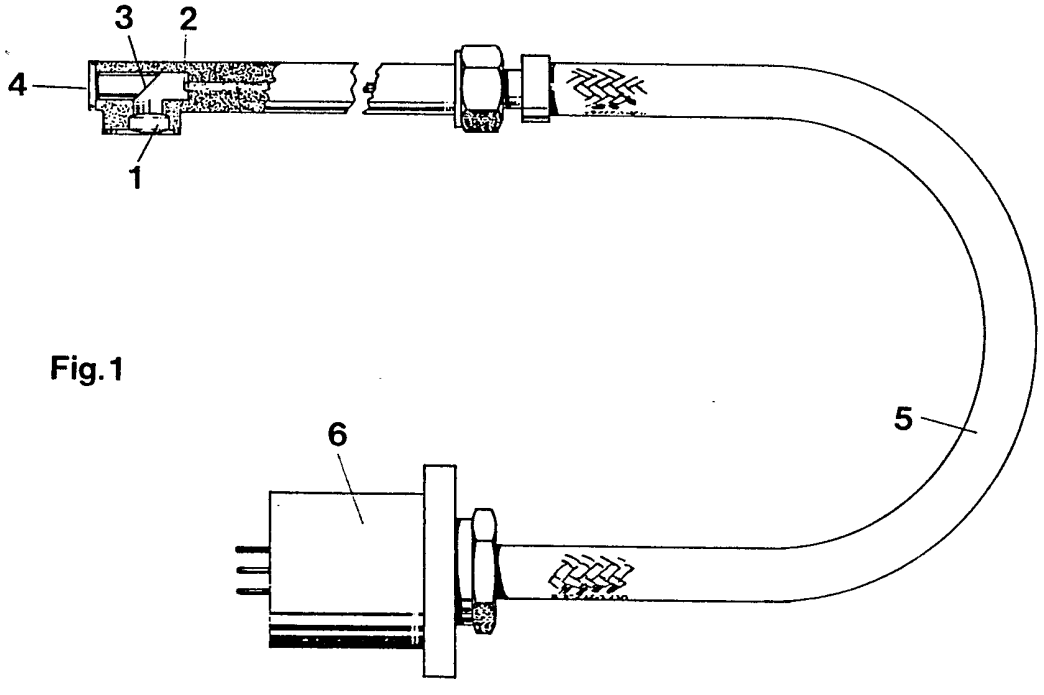

Fig.1

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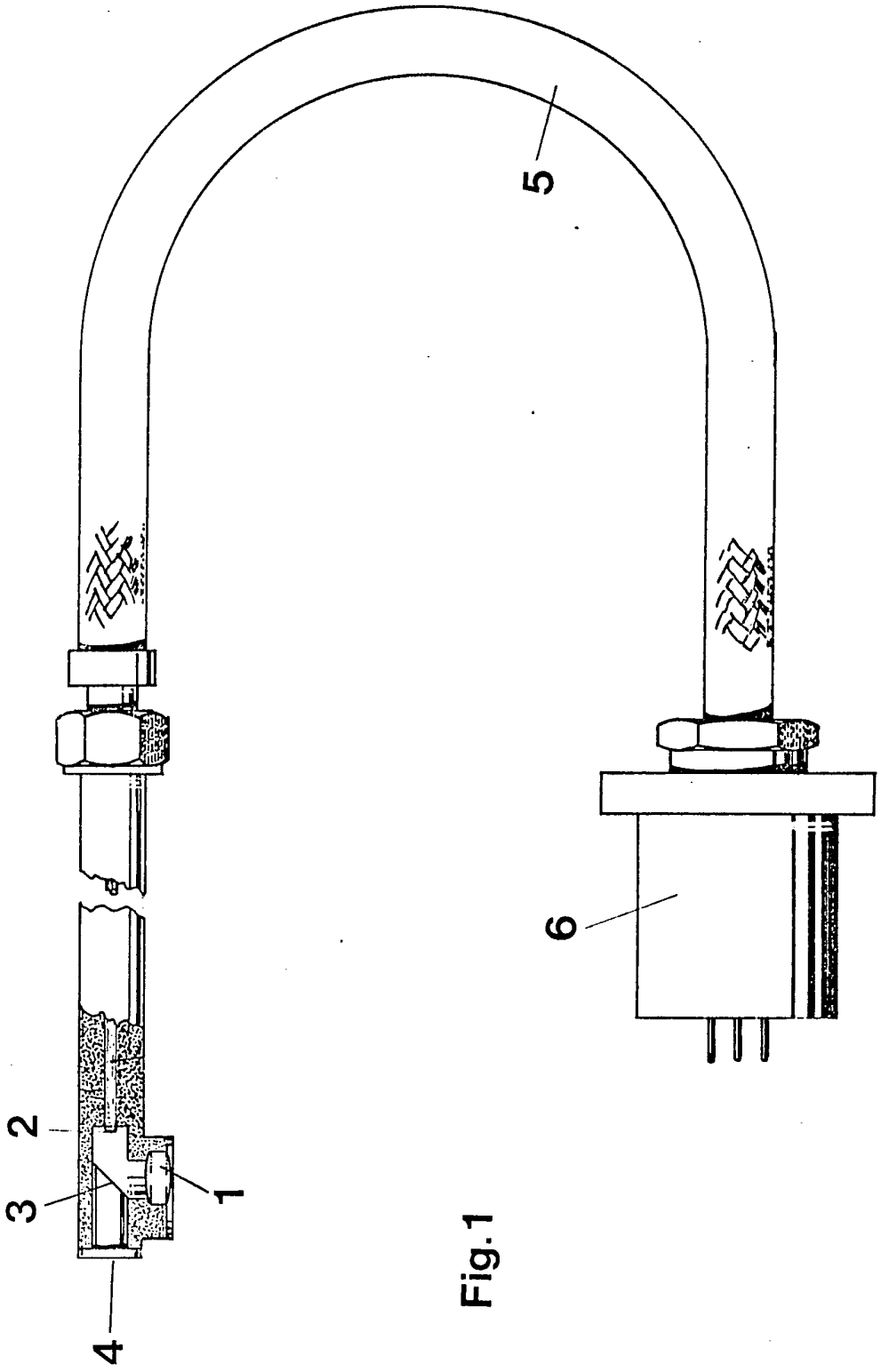

Fig.1

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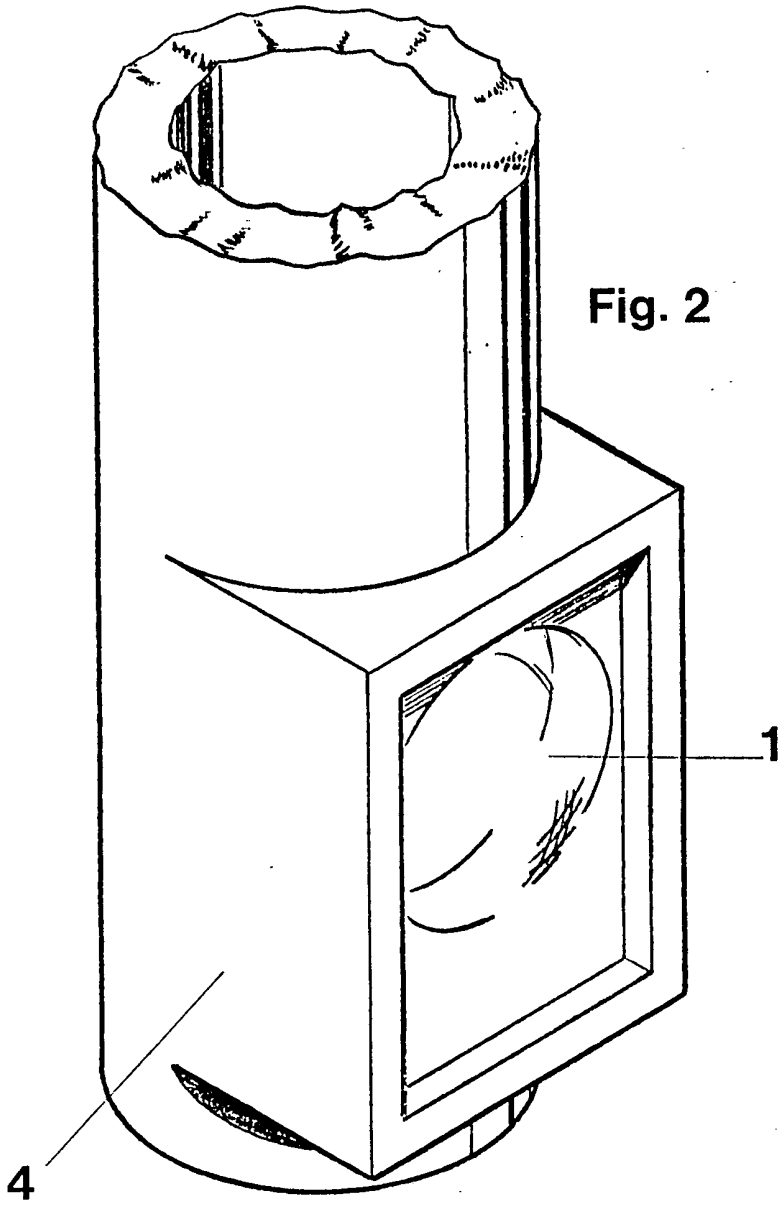

Fig. 2

SPECIFICATION

Reflex pyrometer sighting

This invention relates to a method of sighting a radiation pyrometer.

Radiation pyrometry is a well-established technique of non-contact surface temperature measurement.

To achieve a temperature measurement, there must be a line of sight between the surface under measurement and the optics of the pyrometer along the optical axis of the pyrometer. In some cases this is not possible without the use of a mirror, external to the pyrometer, to provide a reflex line of sight.

Such an arrangement has certain disadvantages. The reflectivity of the mirror is influential on the temperature reading. The mirror surface can become contaminated if operated in a dirty environment.

According to the present invention, there is an internally-mounted mirror, or other optical device, within the pyrometer optics to provide a reflex optical system. In this way, the pyrometer line of sight may be angled to the principal optical (or mechanical) axis, eliminating the need for an external mirror.

A specific embodiment of the invention will now be described by way of example, with reference to the accompanying drawings, which show:

Figure 1 illustrates a pyrometer transducer designed for use in a gas-turbine engine. A target area of turbine blade is defined by lens (1), mirror (3), and field stop (2). The optic probe (4) is inserted into the engine and the collected radiation routed to the detector enclosure (6) via fibre-optic cable (5).

Figure 2 shows the probe tip of such an arrangement having lens (1) mounted with its optical axis perpendicular to the mechanical axis of the probe (4).

Referring to the drawings, radiation from the target is collected by the lens (1) and is focussed onto the field stop (2). The radiation is reflected internally by a mirror (3). The mirror is sealed into the optic probe (4), so that it may not be contaminated by the environment in which the optic probe is operating. The only optical surface which is exposed to the engine environment is the external surface of the lens (1).

CLAIMS

1. A pyrometer transducer, incorporating an internal optical element between its external lens and field stop, which has the effect of bending the radiation path from the lens so that the optical axis of the lens may be arranged to be at an angle to the optical axis of the rest of the instrument.

2. A pyrometer transducer as claimed in Claim 1, where the optical element between lens and field stop is a mirror.

3. A pyrometer transducer as claimed in Claim 1, where the optical element between the lens and field stop is a prism used to bend the radiation path by refraction.

4. A pyrometer transducer as claimed in Claim 1, where the optical element between the lens and field stop is a prism used to bend the radiation by total internal reflection.

5. A pyrometer transducer as claimed in Claims 1 to 4, where the optical component used to bend the radiation between lens and field stop is an integral part of the lens.

6. A pyrometer transducer as claimed in Claims 1 to 5 having a greater number of optical elements.

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