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(56) Documents cited
**GB 2154645 A GB 2145463 A GB 0476646 A
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(54) Mounting arrangements providing adjustment

(57) An infra red detector has a body (3) mounted on a base (1) to be rotatable about two axis (6, 5). Three wedging components (7, 10, 11) are distributed along axis (6). A locking member (12) is used to frictionally lock the three components together. The three components are provided with co-operating inclined surfaces giving a wedging action such that, when they are drawn together they tend to lock to the base to inhibit rotation about one axis (5) and lock the body (3) to the locking member to inhibit rotation about the other axis (6).

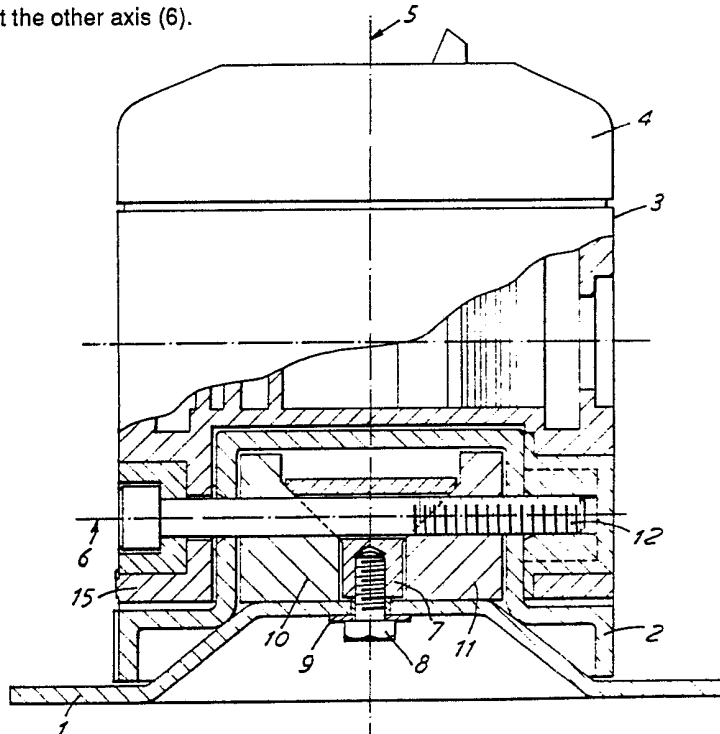


FIG.3

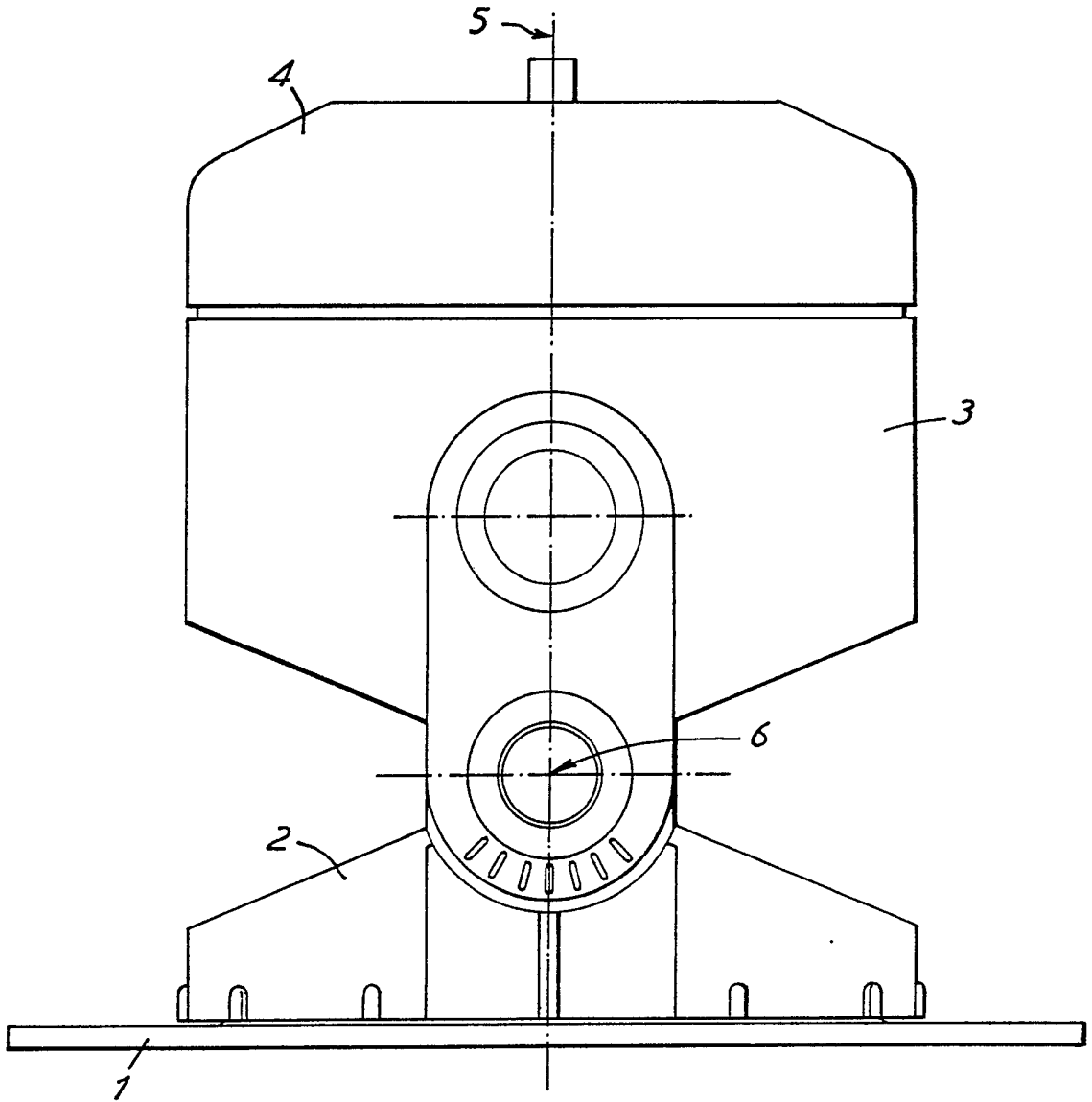


FIG. 1

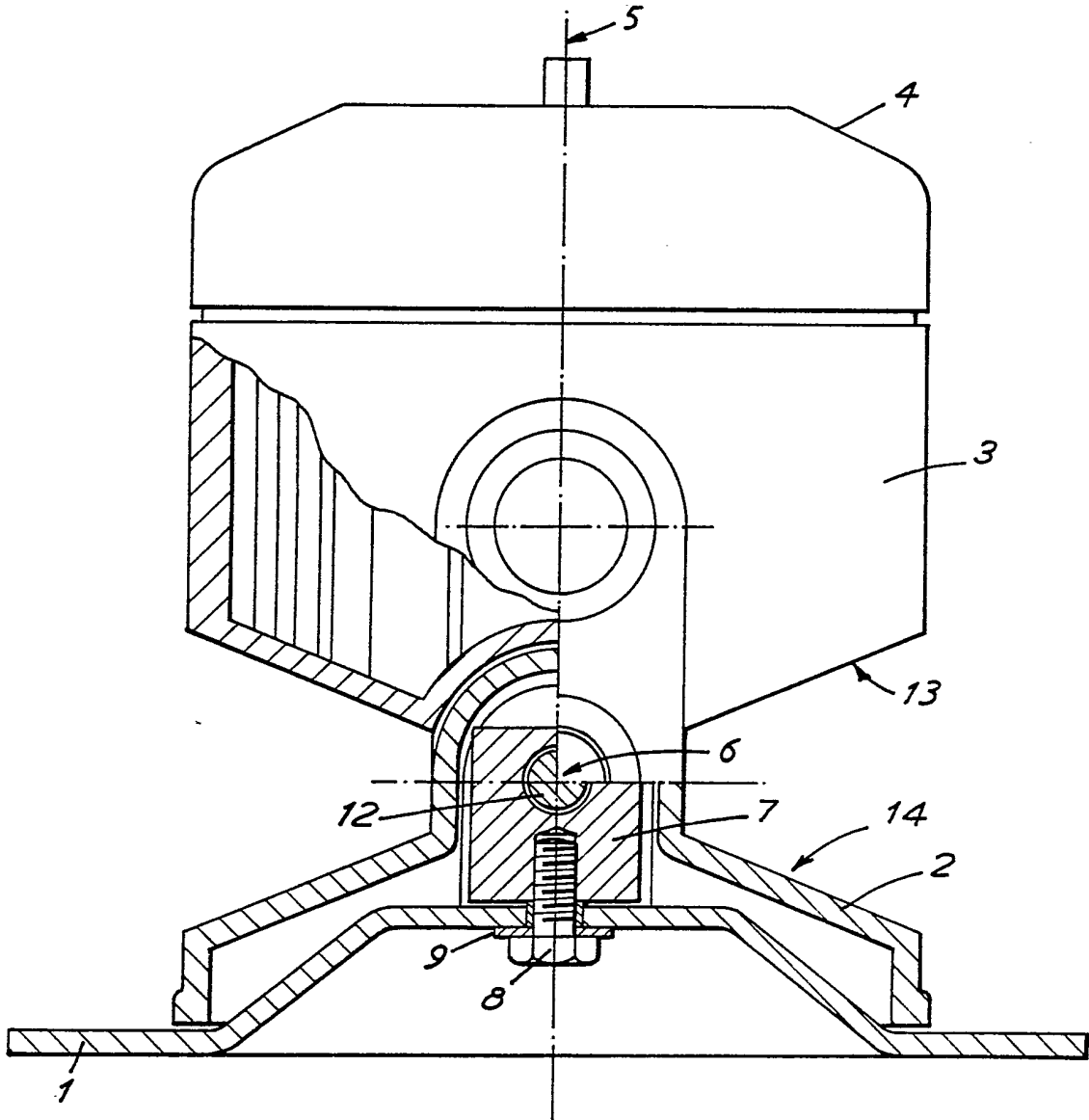


FIG. 2

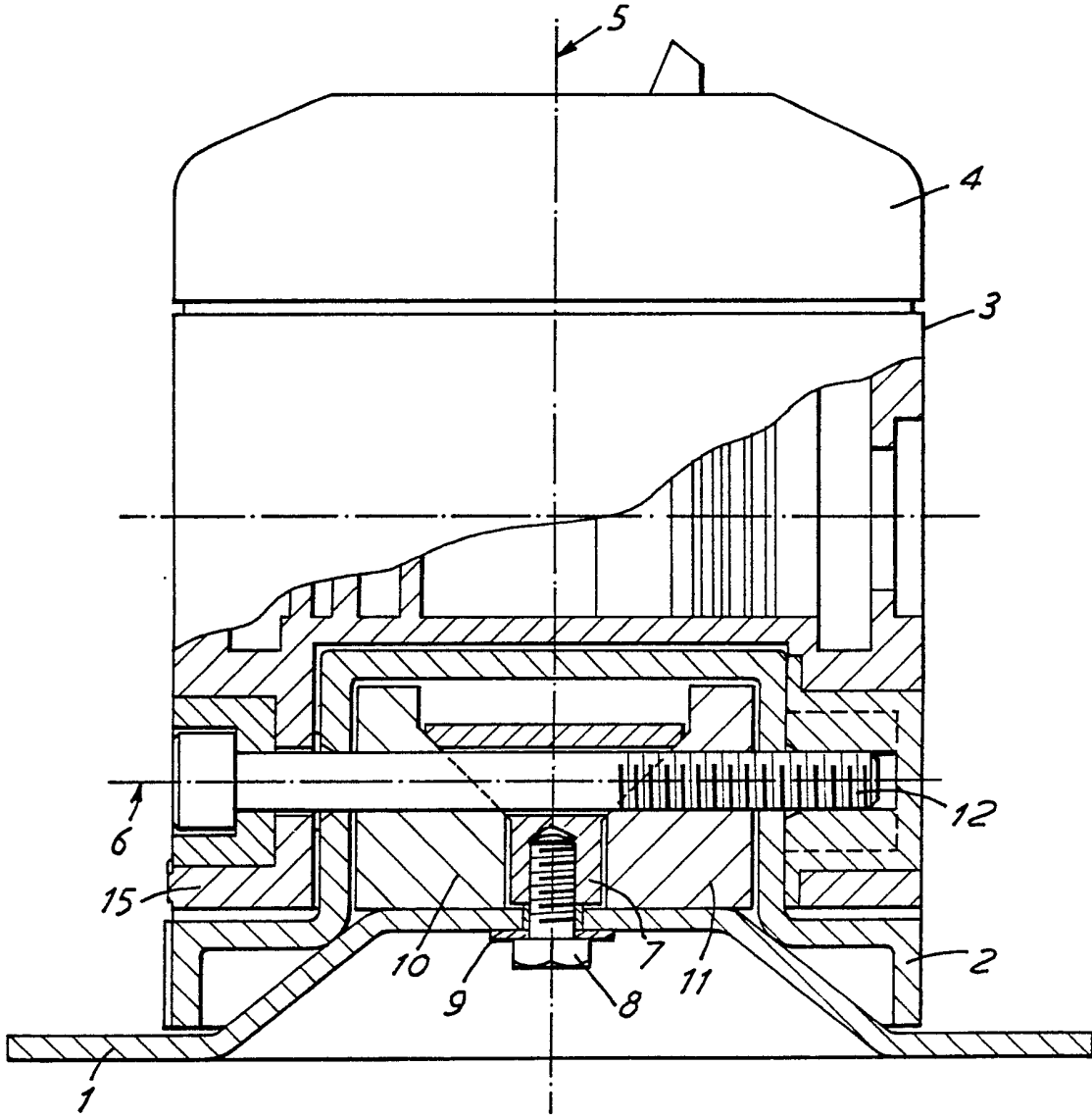


FIG. 3

MOUNTING ARRANGEMENTS

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This invention relates to mounting arrangements, and it relates in particular though not exclusively, to such arrangements as may be used for mounting to a rigid base a device such as a detector of infra-red radiation, which may need
5 to adopt any one of a large number of angles of view from the base. In such circumstances it is desirable that the sensor device has at least two degrees of freedom of movement relative to the base, and it is an object of this invention to provide a mounting arrangement which accommodates such movement, and which
10 permits the device to be locked in position.

According to the invention there is provided an arrangement for mounting a device relative to a base, the device being capable of movement with at least two degrees of freedom relative to said base, the arrangement including a locking
15 member adapted to lock the device in a chosen position relative to said base in each of said two degrees of freedom. This allows the device to be locked in position solely by the use of a single locking member.

The facility to lock the device in position by means of a
20 unitary locking member is extremely useful when the sensor device has to be mounted in an adverse environment, such as on an oil rig, and in circumstances where it would not be convenient for the fitting engineer to utilise both hands to secure the sensor device in its desired position. This
25 invention enables the fitting engineer to secure the sensor device in the desired relative position to the base by

appropriately tightening the aforementioned unitary locking member, and this operation can be done single handed.

In order that the invention may be clearly understood and readily carried into effect, one embodiment thereof will be
5 described by way of example only. With reference to the accompanying drawings of
which:-

Figure 1 shows a general external view of a device, including a mounting arrangement, in accordance with one example
10 of the invention,

Figure 2 shows the device from the same view as in Figure 1, but with part of the external covering cut away to reveal some relevant portions of the interior, and

Figure 3 shows, from an angle 90° displaced from that of
15 Figures 1 and 2, the device again with certain parts of the outer cover cut away to reveal relevant interior components.

Referring now to the drawings, and in particular Figure 1, the device as shown is supported on a base plate (1) which may have a number of holes drilled therethrough by means of which the base plate may be supported to a support structure, not
20 shown, for example a convenient fixed locating position on an oil rig. Secured to the base plate (1) by means of a mounting arrangement, in accordance with one example of this invention, are a pivot mechanism cover (2), constructed of a suitable plastics material, and a main body housing (3) of the detector
25 device in question. The detector arrangement is housed within the body housing (3) and is secured thereto by means of a clamping ring component (4). The field of view of the detector device is centred on the axis shown at (5) in Figure 1, and this axis can be tilted by plus or minus 45° by moving the main

body housing (3) about a pivot point (6) to which further
reference will be made hereinafter. The pivot mechanism
covermoulding (2) can be rotated through 360° relative to the
base plate (1), to enable the field of view of the detector to
5 be moved in two dimensions.

In accordance with this example of the invention, and as
will be described in more detail hereinafter, the rotating
mechanism of the cover (2) relative to the base plate (1) and
the tilt mechanism of the housing (3) relative to the cover (2),
10 can both be locked by a single unitary locking member.

Referring now in more detail to Figures 2 and 3, the 360°
rotational movement of the cover (2) relative to the base plate
(1) is permitted by a structure including a wedge member (7),
which is rotatably mounted to the base plate (1), and is
15 rotatably secured relative thereto by means of a bolt (8) and
washer (9). It will be appreciated that the wedge member (7) is
wedge shaped in one dimension only. Disposed to either side of
the wedge member (7) are respective co-operative wedges (10) and
(11), both being formed with apertures to receive a central
mounting bolt (12). The aperture in wedge (10) is plain and
20 permits the bolt (12) to rotate freely therein, whereas the
aperture in wedge (11) is threaded so that as the bolt (12) is
tightened, the two wedges (10) and (11) are drawn into ever more
tightening relationship to the base mounted wedge (7), and when
sufficient tightening force is applied to the bolts (12), the
interaction of the wedges (7), (10) and (11) and base plate (1)
25 is such as to prevent further rotation of the pivot cover (2)
relative to the base plate (1).

The main housing (3) can, as previously mentioned, tilt about the axis of the bolt (12) relative to the pivot mechanism cover (2), the external shaping of the under side of the main cover (3) and the top side of the pivot mechanism cover (2) being shaped as shown at (13) and (14) to accommodate a predetermined degree of tilting about this axis. In this example the degree of tilt is 45° in each direction. As can be envisaged, since the axis of bolt (12) is orthogonal to and intersects the axis (5) which is central to the field of view of the sensor, and which co-incides with the the longitudinal axis of the bolt (8). The single act of tightening the bolt (12) locks the sensor against both the tilting movement about pivot (6), and the rotational movement about the axis (5).

The bolt (12) could of course be replaced by any convenient locking device, but if a bolt is used it is preferable for it to have a deep seated washer such as that shown at (15), and for the head of the bolt (12) to be recessed into that washer. Preferably the characteristics of the material of the washer are such as to co-operate with the head of the bolt (12) to inhibit the bolt from accidental rotation, which might be caused by vibration etc. The head of bolt (12) can be conveniently formed with an Allen key slot so that tightening of the bolt can be achieved by means of an Allen key in usual fashion.

There is great significance in being able to lock the sensor against its two degrees of freedom with a single unitary locking member such as bolt (12), because the fitting engineer can physically hold on to a convenient support with one hand whilst locking the device up in its desired orientation with the other hand.

It will be appreciated that the materials of the wedges (7), (10) and (11) should be such as to co-operate with each other and the base plate (1) in locking the sensor against rotation. Likewise, it will be appreciated that the relevant
5 material of housing (3), together with the intervening material of the pivot mechanism cover plate (2) must be such as to co-operate and to deform to a sufficient extent to lock the sensor against the tilting movement about pivot (6).

CLAIMS

1. An arrangement for mounting a device relative to a base, the device being capable of movement with at least two degrees of freedom relative to said base, the arrangement including a locking member adapted to lock the device in a chosen position relative to said base in each of said two degrees of freedom.

2. An arrangement according to claim 1 in which the locking member comprises a locking device adopted to draw together and lock relative to one another components distributed along the axis of one of the said degrees of freedom and intersecting the axis of said other degree of freedom.

3. An arrangement according to claim 2 in which the locking member is a threaded bolt co-operating with a threaded one of said components.

4. An arrangement according to either claim 1 or claim 2 in which said distributed components comprise a plurality of components having aligned surfaces inclined to said axis so as to provide a wedged locking action when drawing together along said axis to inhibit motion about said first degree of freedom.

5. An arrangement according to claim 4 in which said distributed components comprise three components contacting at said aligned inclined surfaces.

6. An arrangement according to either of claims 4 and 5 in which one of said distributed components includes an axle providing motion of the device relative to the base along the second of said degrees of freedom and in which the alignment of the inclined surfaces is such that drawing together of the

components tends to lock said one component to the base and inhibit motion about said second degree of freedom.

7. An arrangement according to claim 6 as dependent on claim 5 in which the centre of said three distributed components
5 includes said axle.

8. An arrangement according to any preceding claim in which the device is a detector device using movement in said two degrees of freedom to change the direction of view thereof.