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(54) **A DAMPER DEVICE**

DÄMPFERVORRICHTUNG

DISPOSITIF AMORTISSEUR

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**US-A- 4 259 983**

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## Description

### The field of the invention and prior art

This invention relates to a damper device comprising a flow conducting casing and a damper element turnably arranged in the casing, which element is mounted on a detachable clean-out door. The damper device is preferably intended for air flow regulation in ventilation arrangements.

From the Swedish patent 434 569 a device of the kind mentioned by way of introduction is known since earlier. In this patent, the damper element is turnably hung up in a clean-out door which is detachable. Furthermore, the damper element is fastened to the clean-out door via a manoeuvre shaft.

The known embodiment is associated with the primary drawback that the mechanics for the transmission of forces to the damper element for the regulation of the latter gets somewhat complicated.

A secondary drawback with the known embodiment is that it becomes difficult to arrange measuring terminals for air flow regulation in the clean-out door depending on that the damper element in the form of a blade has to move in relation to the clean-out door.

A known damper device is the so called throttle damper. These are often marketed with three different types of damper elements in the form of blades, namely sealing, non-sealing and perforated damper blades. From a stocking point of view, this damper device becomes very space demanding, especially for manufacturing companies, which forms a tertiary drawback.

It is previously well known to do measurements of fall of pressure over damper devices for the determination of the flow amount. With dampers of throttle type there is however a quaternary drawback. At completely open damper, the fall of pressure is namely almost zero and accordingly measurement can not be done.

### Summary of the invention

In the first place, the present invention intends to indicate a damper device with such a constructive design that the primary drawback discussed above is eliminated or at least reduced.

According to the invention, this object is obtained through the clean-out door being turnably arranged in relation to the casing and the damper element being connected to the clean-out door to accompany the turning of the latter.

According to the invention, the secondary drawback above is reduced thanks to measuring terminals being arranged in the clean-out door for static measurement of fall of pressure.

The tertiary drawback above is reduced thanks to the damper element being detachably connected to the clean-out door. Thereby, a certain damper element might be detached from the clean-out door and replaced by an-

other one.

The quaternary drawback above is reduced thanks to at least one means for increase of fall of pressure being mounted in the area between orifices of the measuring terminals on the bottom side of the clean-out door. Thereby the fall of pressure over the damper device is secured even when the damper element is completely open or almost completely open.

Further preferred characteristics of the damper device according to the invention become clear from the following patent claims and the description.

### Brief description of the drawings

With reference to enclosed drawings, a shorter description of an embodiment of the invention, stated as an example, follows below.

In the drawings:

Fig 1 is a schematic side view of the damper device in open position,

Fig 2 is a view of the damper device, regarded according to the line A in Fig 1,

Fig 3 is a view of the damper device, regarded from the line B in Fig 1,

Fig 4 is a side view of the clean-out door of the damper device, regarded from the line C in Fig 2,

Fig 5 is a perspective view of a non-sealing, blade like damper element, and

Fig 6 is a perspective view of a sealing, blade like damper element.

### Detailed description of a preferred embodiment

The damper device according to the invention comprises a flow conducting casing 1. In the example, this casing has a curved mantle wall, for instance a cross-section-wise circular one, though this is not necessary. The casing 1 is intended to be part of a flow conducting channel, for example a ventilation arrangement, and is intended to be connected to further casing or channel elements at its ends 12, 13, sealing elements 14 arranged at these ends being intended to function sealingly. In the casing 1 a damper element 2 is turnably arranged. This is mounted on a detachable clean-out door 3. More precisely, the clean-out door 3 is turnably arranged in relation to the casing 1 and the damper element 2 is connected to the clean-out door to accompany the turning of the latter.

The damper element 2 has a blade like shape and at the bottom it shows a curved portion 15 designed in correspondence with the inner, curved mantle wall of the casing 1.

The clean-out door 3 seals an opening 16, through which admission into the casing 1 can be obtained at displaced clean-out door. In the example, the orifice 16 is defined by a tube portion 17, which adjoins to the casing 1 and preferably extends at an angle, especially almost right angle, to the longitudinal centre axis of the casing 1. The casing 1 merges into the tube portion 17 via curved transition portions 18 appearing from Fig 1.

In the example, the damper element 2 will extend a bit up into the tube portion 17 and presents opposite edges 19, which are essentially mutually parallel.

In the example the clean-out door 3 presents a body portion 20 which is introducible into the tube portion 17 and which, for example, might consist of a plate casing filled with a fire resistant, and suitably also thermally insulating, material, such as mineral wool. In the example, the clean-out door 3 comprises a mantle 21 designed to externally engage around the tube portion 17 so that the outer end of the latter becomes located between the mantle portion 21 and the body portion 20. On the mantle portion 21 or, as in the illustrated example, on the tube portion 17, a sealing means 22 can be mounted to seal between the mantle portion 21 and the tube portion 17.

The damper element 2 is detachably connected to the clean-out door 3. More exactly, the latter presents members 4 for displaceable engagement with the damper element 2. The engagement members 4 consist of slots, into which the damper element runs. Accordingly, different types of damper elements can be mounted on one and the same clean-out door 3 by being displaced into engagement with the slots 4 of the clean-out door.

The described damper device can also be used during channel cleaning thanks to the damper element being taken away from the clean-out door before the clean-out door is reassembled during the course of cleaning. Extra sealing doors for cleaning are therefore not required.

In Fig 5, an example of a simple, non-sealing, blade like damper element is shown. This has been reinforced thanks to a centrally located folding 16. The damper element presents portions 23 for engagement in the engagement members 4 of the clean-out door 3. In the example, the portions 23 have the character of flaps protruding towards the sides and being insertable in the member 4 designed as slots. In Fig 6 an example of a sealing damper element is shown, where two single damper blades 17 have an interjacent, sealing packing 18. Here, the portions 23 for engagement with the members or slots 4 of the clean-out door consist of parts of the damper blades 17 bent towards opposite sides.

During turning of the clean-out door 3 in relation to the tube portion 17, the damper element 2 will move in the interior of the casing 1 so that a varying degree of flow throttling arises. Existing friction, for instance with assistance of the sealing means 22, results in the clean-out door remaining in adjusted position. To lock the clean-out door 3 at the casing 1, there are two clamp-shaped and suitably elastic holders 12, 13, which

also serve for the marking of the position of the damper element 2 with assistance of the scale 14 on the mantle portion 21 of the clean-out door 3. The holders 12, 13 are fastened on the out-side of the tube portion 17 and grip with their outer ends around the upper portion of the clean-out door 3.

The damper device comprises members for restoration of an adjusted flow value after channel cleaning. This member suitably comprises a rider 15, which is connected to the clean-out door. This rider can be fixed at the tube portion 17, for example by means of a locking screw protruding through the rider and the tube portion 17.

In the clean-out door 3 there are two measuring terminals 6, 7 for determination of the fall of pressure over the damper element 2 and adjusted flow amount. The flow amount is proportional to the throttle degree on the scale 14 and current fall of pressure.

The measuring terminals 6 and 7 emerge into the bottom side of the clean-out door 3 at 8 and 9 respectively, on either side of the damper element 2, as most clearly appears from Fig 2.

Each of the measuring terminals 6 and 7 comprises an upper tube portion 24 and a tube 25, which is connected to the tube portion 24 and which extends through the clean-out door 3 and ends with an end portion 26 a bit beneath the bottom side of the clean-out door. Above the upper side of the clean-out door 3 a transverse means 27 is fastened, which is intended to facilitate the turning of the clean-out door by being gripped by the hands of a present operator. In the example this transverse means 27 has the shape of a hollow, cross-section-wise rectangular profile, which upwards shows a recess 28. In this recess 28 a part 29 that includes the tube portions 24 of the measuring terminals 6, 7 is insertable. A cover 30 serves for sealing of the upper ends of the tube portions 24 when no measuring of fall of pressure is accomplished. This cover 30 might for example be pivotably connected to the part 29 and present suitable locking members to be fixed in relation to the part 29 when being in its closed position sealing the tube portions 24. The closed position is shown in Fig 1 and 2.

The measuring terminals 6, 7 could also be designed as rigid tube sections extending through the clean-out door 3 beside possible manoeuvring means arranged on the latter.

At least one means 10, 11 for increase of fall of pressure is mounted in the area between the orifices 8, 9 of the measuring terminals 6, 7 on the bottom side of the clean-out door 3. This means 10, 11 for increase of fall of pressure is designed as a plate.

For each of the orifices 8, 9 of the measuring terminals there is an own means 10, 11 for increase of fall of pressure. These means or plates 10, 11 extend as appears from Fig 2 and 3 from the damper element 2 to the outer edge of the clean-out door 3.

The purpose of the one or more means 10, 11 for increase of fall of pressure is to, at completely or almost

completely open damper element 2, work promotively for fall of pressure between the orifices 8, 9 of the measuring terminals 6, 7 on the bottom side of the clean-out door so that a fall of pressure can be measured and the flow amount thereby be settled.

The described damper device is not just limited to the above described embodiment. For example, it would be possible to design the damper element 2 as firmly associated with the clean-out door 3 instead of making the damper element detachable. The essence of the idea of the invention is that the clean-out door 3 shall be turnable in relation to the casing 1, and the damper element 2 so connected to the clean-out door that the turning of the latter gives rise to readjustment of the damper element in the casing 1 and thereby change of the throttling of the damper element of the flow through the casing.

### Claims

1. A damper device especially for flow regulation of ventilation arrangements, comprising a flow conducting casing (1) and a damper element (2) turnably arranged in the casing, which element is mounted on a detachable clean-out door (3), **characterized** in that the clean-out door (3) is turnably arranged in relation to the casing (1) and that the damper element (2) is connected to the clean-out door to accompany the turning of the latter.
2. A device according to claim 1, **characterized** in that measuring terminals (6, 7) are arranged in the clean-out door (3) for static measuring of fall of pressure.
3. A device according to any of claims 1 and 2, **characterized** in that the damper element (2) is detachably connected to the clean-out door (3).
4. A device according to claim 3, **characterized** in that the clean-out door (3) presents members (4) for displaceable engagement with the damper element (2).
5. A device according to claim 4, **characterized** in that the engaging members (4) consist of slots, in which the damper element runs.
6. A device according to claim 2, **characterized** by at least one means (10, 11) for increase of fall of pressure mounted in the area between orifices (8, 9) of the measuring terminals (6, 7) on the bottom side of the clean-out door (3).
7. A device according to claim 6, **characterized** in that the means (10, 11) for increase of fall of pressure is designed as plate.
8. A device according to claim 6 or 7, **characterized** in that for each measuring terminal (6, 7) respectively, there is an own means (10, 11) for increase of fall of pressure.
9. A device according to claim 7 or 8, **characterized** in that the plate (10, 11) for increase of fall of pressure extends from the damper element (2) to the outer edge of the clean-out door (3).

### Patentansprüche

1. Dämpfervorrichtung, besonders für Strömungsregulierung von Ventilationsanordnungen, mit einem störungsführenden Gehäuse (1) und einem Dämpferelement (2), das schwenkbar in dem Gehäuse angeordnet ist, wobei dieses Element an einer lösbaren Entleerungstür (3) befestigt ist, **dadurch gekennzeichnet**, daß die Entleerungstür (3) in bezug auf das Gehäuse (1) schwenkbar angeordnet ist und daß das Dämpferelement (2) mit der Entleerungstür verbunden ist, um die Schwenkung der letzteren mitzumachen.
2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet**, daß Meßanschlüsse (6, 7) in der Entleerungstür (3) für statische Messung von Druckabfall angeordnet sind.
3. Vorrichtung nach einem der Ansprüche 1 und 2, **dadurch gekennzeichnet**, daß das Dämpferelement (2) lösbar mit der Entleerungstür (3) verbunden ist.
4. Vorrichtung nach Anspruch 3, **dadurch gekennzeichnet**, daß die Entleerungstür (3) Einrichtungen (4) zum lösbaren Eingriff mit dem Dämpferelement (2) hat.
5. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet**, daß die Engriffeinrichtungen (4) aus Schlitten bestehen, in welche das Dämpferelement geht.
6. Vorrichtung nach Anspruch 2, **gekennzeichnet durch** wenigstens eine Einrichtung (10, 11) zur Steigerung von Druckabfall, die in dem Bereich zwischen Öffnungen (8, 9) der Meßanschlüsse (6, 7) an der Bodenseite der Entleerungstür (3) befestigt ist.
7. Vorrichtung nach Anspruch 6, **dadurch gekennzeichnet**, daß die Einrichtung (10, 11) zur Steigerung von Druckabfall als Platte gestaltet ist.
8. Vorrichtung nach Anspruch 6 oder 7, **dadurch gekennzeichnet**, daß für jeden Meßanschluß (6,

7) jeweils eine eigene Einrichtung (10, 11) zur Steigerung von Druckabfall vorgesehen ist.

9. Vorrichtung nach Anspruch 7 oder 8, **dadurch gekennzeichnet**, daß sich die Platte (10, 11) zur Steigerung von Druckabfall von dem Dämpferelement (2) zu der Außenkante der Entleerungstür (3) erstreckt.

9. Dispositif suivant la revendication 7 ou 8, caractérisé en ce que la plaque (10, 11) pour augmenter la chute de pression s'étend depuis l'élément de registre (2) jusqu'au bord externe de la porte de nettoyage (3).

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## Revendications

1. Dispositif de registre, en particulier pour la régulation d'un écoulement d'agencements de ventilation, comprenant un boîtier (1) qui guide l'écoulement et un élément de registre (2) agencé dans le boîtier de façon à pouvoir tourner, l'élément étant monté sur une porte de nettoyage (3) détachable, caractérisé en ce que la porte de nettoyage (3) est agencée de façon à pouvoir tourner par rapport au boîtier (1) et en ce que l'élément de registre (2) est relié à la porte de nettoyage pour accompagner la rotation de celle-ci. 15
2. Dispositif suivant la revendication 1, caractérisé en ce que les points de mesure (6, 7) sont agencés dans la porte de nettoyage (3) en vue d'une mesure statique d'une chute de pression. 25
3. Dispositif suivant l'une quelconque des revendications 1 et 2, caractérisé en ce que l'élément de registre (2) est relié de façon détachable à la porte de nettoyage (3). 30
4. Dispositif suivant la revendication 3, caractérisé en ce que la porte de nettoyage (3) présente des membres (4) en vue d'entrer en prise de façon amovible avec l'élément de registre (2). 35
5. Dispositif suivant la revendication 4, caractérisé en ce que les membres de mise en prise (4) consistent en des encoches dans lesquelles passe l'élément de registre. 40
6. Dispositif suivant la revendication 2, caractérisé par au moins un moyen (10, 11) pour augmenter une chute de pression, monté dans la zone entre des orifices (8, 9) des points de mesure (6, 7), sur le côté inférieur de la porte de nettoyage (3). 45
7. Dispositif suivant la revendication 6, caractérisé en ce que les moyens (10, 11) pour augmenter la chute de pression sont conçus sous la forme d'une plaque. 50
8. Dispositif suivant la revendication 6 ou 7, caractérisé en ce que pour chaque point de mesure (6, 7) respective, il y a un moyen propre (10, 11) pour augmenter la chute de pression. 55

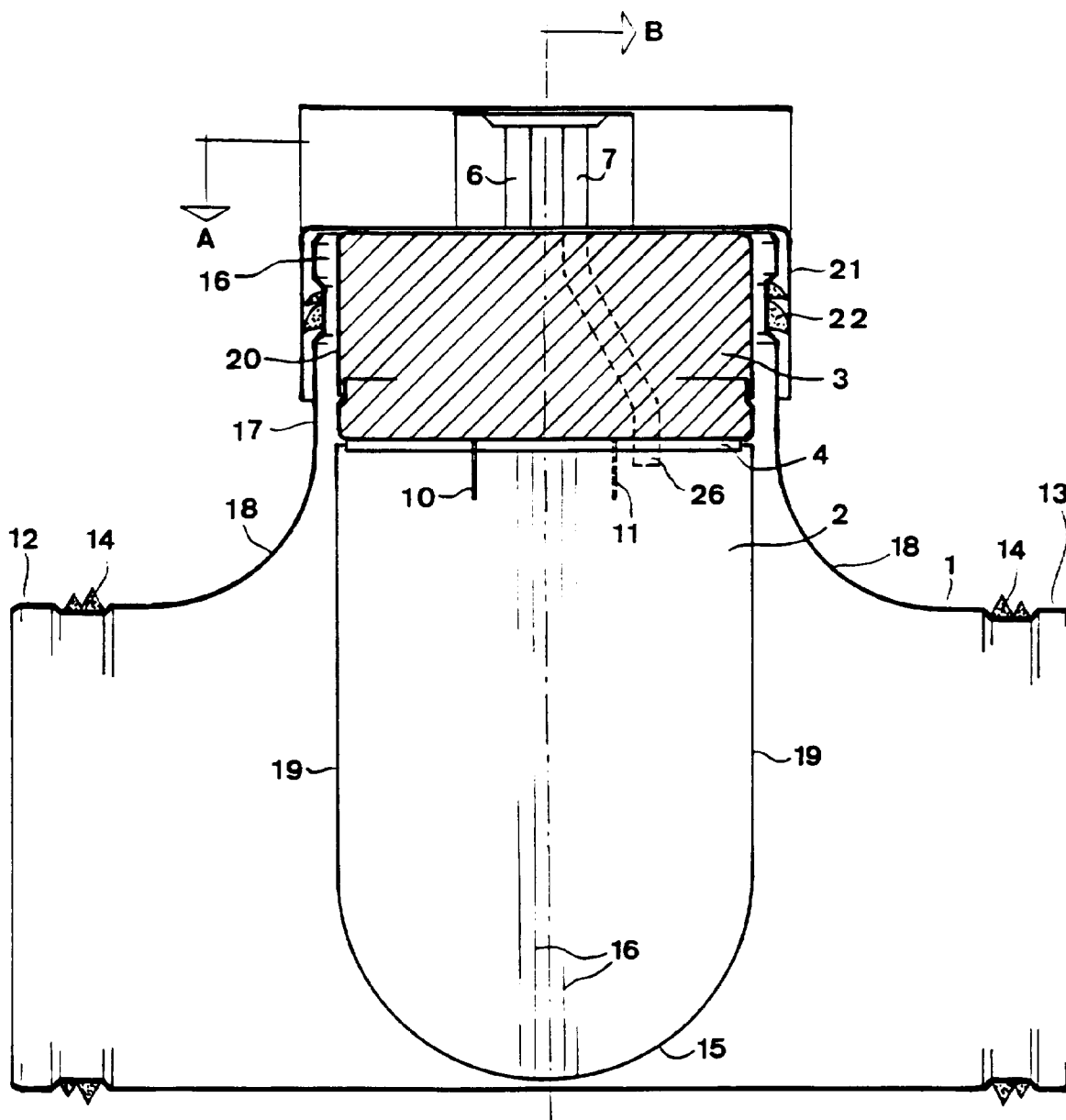


Fig 1

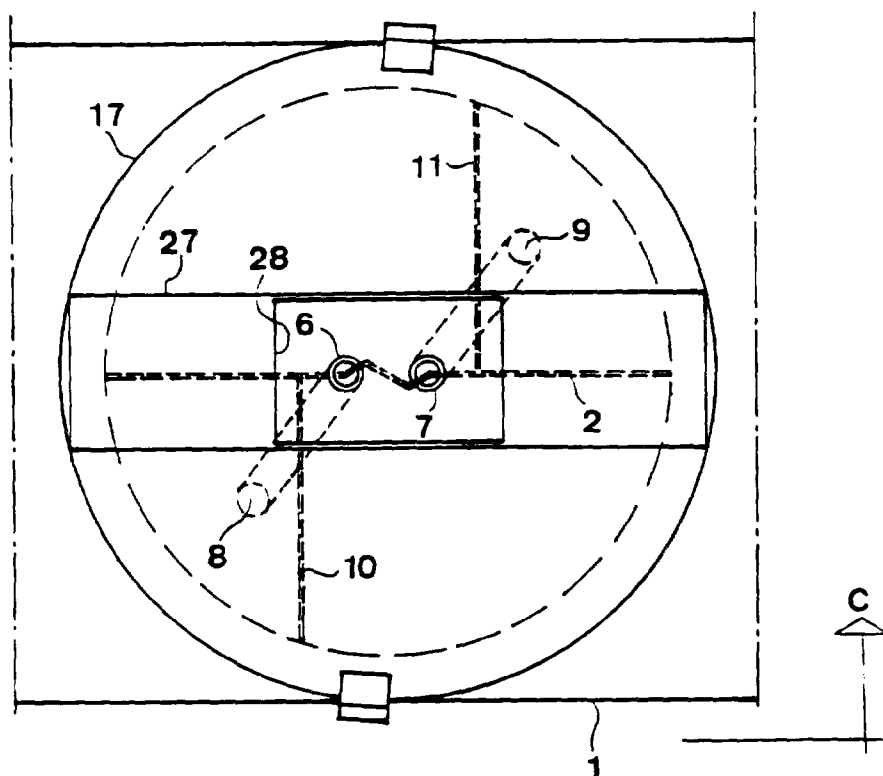


Fig 2

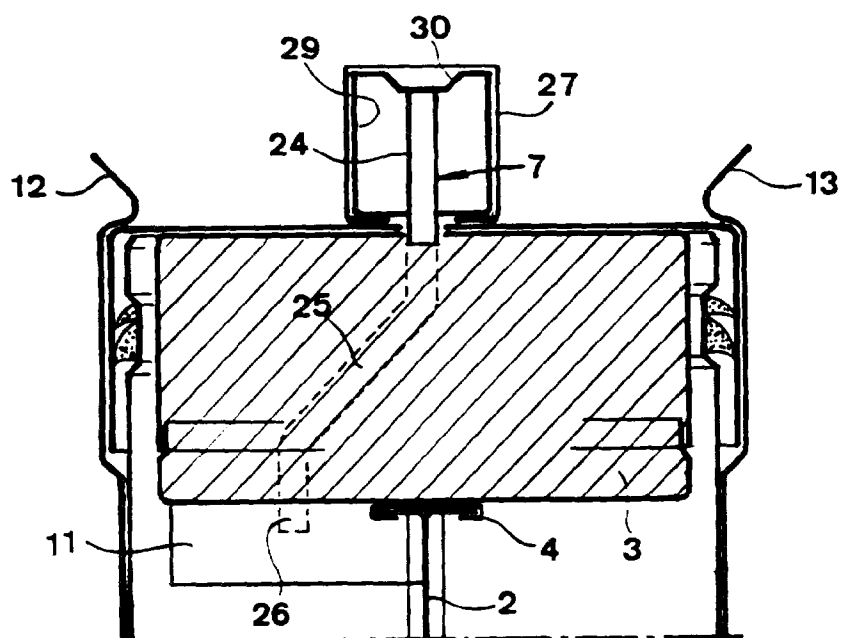


Fig 3

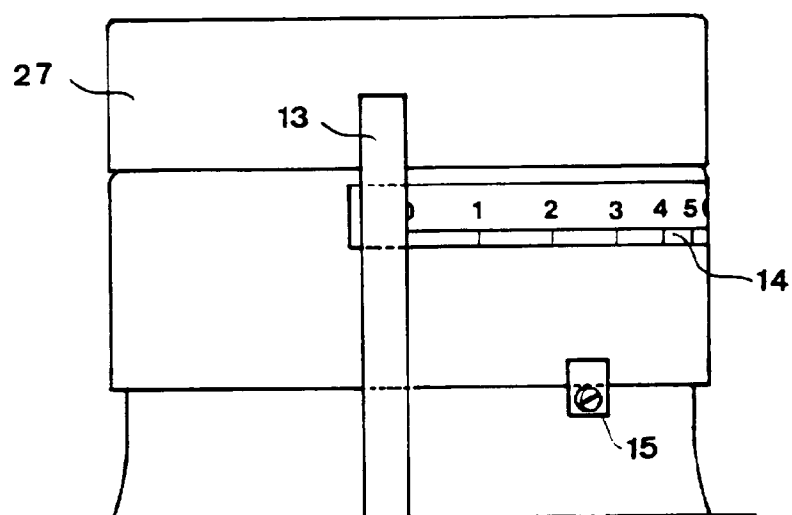


Fig 4

