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(12) (19) (CA) **Demande-Application**

(21) (A1) **2,315,931**

(22) 2000/08/14
(43) 2001/03/18

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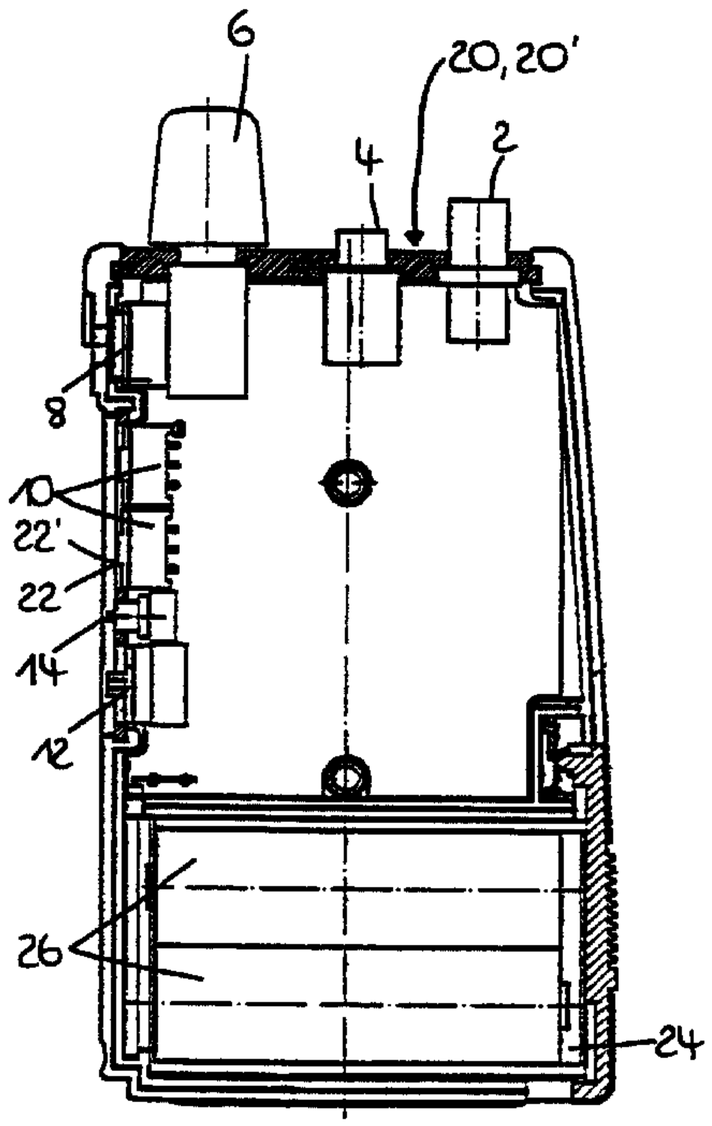
(51) Int.Cl.[7] G12B 9/04
(30) 1999/09/18 (299 16 458.6) DE

(54) **BOITIER POUR INSTRUMENT ELECTRIQUE PORTATIF**
(54) **HOUSING FOR PORTABLE ELECTRICAL INSTRUMENT**



(57) A housing for a portable electrical instrument such as a pocket-sized radio transmitter-receiver. The housing includes a battery compartment having a first connector for electrically connecting one or more batteries to the instrument, a panel for mounting control elements to control operation of the instrument, and at least one section for mounting the panel. The battery compartment can alternatively accept batteries of at least two different types or sizes. A second connector is removably mountable within the battery compartment to electrically connect the battery or batteries to the instrument. Any one of a selected number of different control element mounting panels can be interchangeably mounted on the panel mounting section. The different panels are electrically and mechanically interconnectible to form an integral unit.

Abstract of the Disclosure

A housing for a portable electrical instrument such as a pocket-sized radio transmitter-receiver. The housing includes a battery compartment having a first connector for electrically connecting one or more batteries to the instrument, a panel for mounting control elements to control operation of the instrument, and at least one section for mounting the panel. The battery compartment can alternatively accept batteries of at least two different types or sizes. A second connector is removably mountable within the battery compartment to electrically connect the battery or batteries to the instrument. Any one of a selected number of different control element mounting panels can be interchangeably mounted on the panel mounting section. The different panels are electrically and mechanically interconnectible to form an integral unit.

HOUSING FOR PORTABLE ELECTRICAL INSTRUMENT

Technical Field

The invention concerns a housing for a portable electrical instrument such as a pocket-sized radio transmitter-receiver. The housing's battery compartment alternatively accepts batteries of of at least two different types or sizes.

Background

Housings for portable electrical instruments such as pocket-sized radio transmitter-receivers support and contain the instrument's electrical circuitry, batteries, and control elements such as volume control knobs, frequency tuning knobs, etc.

Conventionally, prior art instrument housings are designed for use with a voltage supply provided by batteries of a particular type determined by the design of the instrument's electrical circuitry. Accordingly, prior art instrument housings have battery storage compartments adapted to contain only one particular type and/or size of battery, with connectors capable of electrically connecting only that one type of battery to the instrument's electrical circuitry. Additionally, prior art instrument housings are typically designed for use with specific panels on which the aforementioned control elements are mounted. Changes in the instrument's electrical circuitry of the type which necessitate substitution of a different type of battery can also necessitate substitution of different control elements mounted on different panels which are incompatible with the housing into which the former panels were mounted.

Prior art instrument housings thus have the disadvantage that they are designed exclusively for use with one particular circuit, both in regard to the battery compartment, and in regard to the control element mounting panel(s). It is potentially possible to employ different circuits with different control elements, as for example may arise from further development of the original circuit, in a previously existing

housing, but the housing sections which must support any new control element mounting panel(s), and/or any new battery storage compartment may have to be modified to accommodate such changes. Each time a different instrument is developed and manufactured such modifications give rise to costs which are especially undesirable if the new instrument is simply a refinement of the original instrument.

DE 3790276 T1 (WO 87/07435) describes a battery compartment which can alternatively accept a lithium battery having both positive and negative terminals on one end of the battery; or, alkaline manganese batteries having positive and negative terminals on opposite ends of the battery. Accordingly, the battery compartment can accommodate different battery types having different sizes and/or different arrangements of positive and negative terminals. The battery compartment also includes spacers which can be moved into a closed position when a battery has been inserted in the battery compartment, or into an open position in which the spacer element has been moved to a position further away from the battery compartment. The battery compartment thus adds flexibility by making it possible to alternate between different battery types. But, if only one particular battery type is intended for use with the instrument, such flexibility can not be taken advantage of. Being additional components, the movable spacer elements are a disadvantage, since they increase the cost of manufacturing a housing equipped with the battery compartment, and since they can be an additional source of defects during use of the instrument.

Summary of Invention

The invention provides a housing for a portable electrical instrument that is particularly economical to manufacture and easy to use. This objective is met by providing the housing with a battery compartment which can alternatively accept at least two different types or sizes of batteries, and inside of which battery terminal connectors can

optionally be installed to connect batteries of different types to the instrument's electrical circuitry. Terminal connectors suitable for the battery type to be inserted into the housing's battery compartment, are installed in the battery compartment during manufacturing of the instrument. Thus, the housing, or housing shells forming the housing, are versatile and can be utilized for different instruments.

In one embodiment, the housing optionally holds different control element mounting panel(s). Preferably during manufacture of the instrument, a one or more panels corresponding to the control elements of the desired electrical instrument is electrically and mechanically joined with the housing to form a unit. In a further embodiment, the control element mounting panel(s) are detachably mountable in or on the housing, so that the panel(s) can be exchanged by the user, for instance if the instrument is to be upgraded to incorporate new control elements and/or electrical circuitry.

Examples of instruments which may incorporate housings formed in accordance with the invention include pocket-sized radio transmitter-receivers, pocket-sized radio transmitters, and pocket-sized radio receivers. The production cycles of instruments of this type are usually so short that new circuitry is continuously being developed and introduced into the marketplace. Possibly, such development may necessitate use of a different type of battery than that employed in earlier models of the same instrument. Such development may also or alternatively result in the provision of new electrical circuitry for the instrument, potentially having different control elements than those employed in earlier models of the same instrument. The present invention's housing can be universally employed for a multitude of ~~such~~ instruments. Thus, the development costs and costs of a production changeover of the portable electrical instrument are reduced.

Brief Description of Drawings

Figure 1 is a front elevation sectional view of a portable electrical instrument incorporating a housing in accordance with the invention and containing batteries of a first type.

Figure 2 is a partially sectioned side elevation view of the Figure 1 apparatus.

Figure 3 is a front elevation sectional view of the Figure 1 apparatus containing batteries of a second type.

Figure 4 is a partially sectioned side elevation view of the Figure 3 apparatus.

Figures 5, 6 and 7 are respectively partially fragmented front elevation, side elevation and top plan views of the portable electrical instrument of Figures 1-4.

Description

The exemplary portable electrical instrument shown in the Figures is a microphone-equipped pocket-sized radio transmitter-receiver incorporating a housing in accordance with the present invention. The instrument contains electrical circuitry (not shown). A socket connector 2 is provided for connecting an antenna to the instrument. Control elements, namely transmit display indicator light 4, volume control knob 6, microphone 8, receive-transmit switch 10, and coarse and fine frequency tuning knobs 12, 14 are also provided. Socket connector 2, display indicator light 4, and volume control knob 6 protrude from the housing's interior to the exterior through openings in top panel 20. Microphone 8, switch 10, and tuning knobs 12, 14 are accessed through corresponding openings in side panel 22. Battery storage compartment 24 housing batteries 26 (Figures 1-2) or 28 (Figures 3-4) is located within the housing, opposite top panel 20.

The housing consists of lower housing shell section 16 and upper housing shell section 18. Housing shells 16, 18 are castings in

which guides are formed to accept top panel 20 and side panel 22 respectively. During manufacture, top panel 20 with control elements 2, 4, 6 mounted thereon; and, side panel 22 with control elements 8, 10, 12, 14, mounted thereon; are inserted into their corresponding guides formed in lower housing shell 16. Upper housing shell 18 is then placed over lower housing shell 16, such that top panel 20 and side panel 22 are further inserted into their corresponding guides formed in upper housing shell 18. Upper housing shell 18 is then fastened to lower housing shell 16 by means of screws 30. Housing shells 16, 18, top panel 20 and side panel 22, are thus electrically and mechanically connected to form an integral housing unit.

The instrument depicted in Figures 1 and 2 contains electrical circuitry (not shown) designed to use a voltage supply consisting of two "AA" type batteries 26. Accordingly, battery compartment 24 must accept two size "AA" batteries. A first connector consisting of opposed contact elements (not shown) is provided within the laterally opposed end walls of battery compartment 24 to electrically connect "AA" batteries 26 to the instrument's electrical circuitry.

The instrument depicted in Figures 3 and 4 contains electrical circuitry (not shown) designed to use a voltage supply consisting of a single 9-volt type battery 28. Bracket 34 mounted within battery compartment 24 retains battery 28 in position within battery compartment 24. Removable connector strip 32 incorporates contact terminals which serve as a second connector for electrically connecting 9-volt battery 28 to the instrument's electrical circuitry, via suitable wires.

An instrument upgrade of the type requiring a changeover from "AA" batteries 26 to 9-volt battery 28 may in some cases necessitate provision of an alternative top panel 20' and/or alternative side panel 22' with associated control elements. In such case, during manufacturing of the instrument, instead of using top panel 20 and/or side panel 22 as previously described, alternative top panel 20' and/or

alternative side panel 22' are inserted into the guides formed in housing shells 16, 18 instead of the top panel 20 and/or side panel 22 used in earlier models of the same instrument.

As will be apparent to those skilled in the art in the light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the spirit or scope thereof. Accordingly, the scope of the invention is to be construed in accordance with the substance defined by the following claims.

WHAT IS CLAIMED IS:

1. A housing for a portable electrical instrument, said housing comprising a battery compartment having a first connector for electrically connecting one or more batteries to said instrument, a panel for mounting control elements to control operation of said instrument, and at least one section for mounting said panel, wherein said battery compartment alternatively accepts batteries of at least two different types or sizes, and wherein a second connector is removably mountable within said battery compartment for electrically connecting said one or more batteries to said instrument.

2. A housing as defined in claim 1, wherein any one of a selected number of different panels are mountable on said section for mounting said panel.

3. A housing as defined in claim 2, wherein said section for mounting said panel and said any one of a selected number of different panels are electrically and mechanically interconnectible to form an integral unit.

4. A housing as defined in claim 2, wherein said any one of a selected number of different panels are detachably mountable on said section for mounting said panel.

5. A portable electrical instrument having a housing as defined in any one of claims 1, 2, 3 or 4, wherein said instrument is any one of a pocket-sized radio transmitter-receiver, a pocket-sized radio transmitter, and a pocket-sized radio receiver.

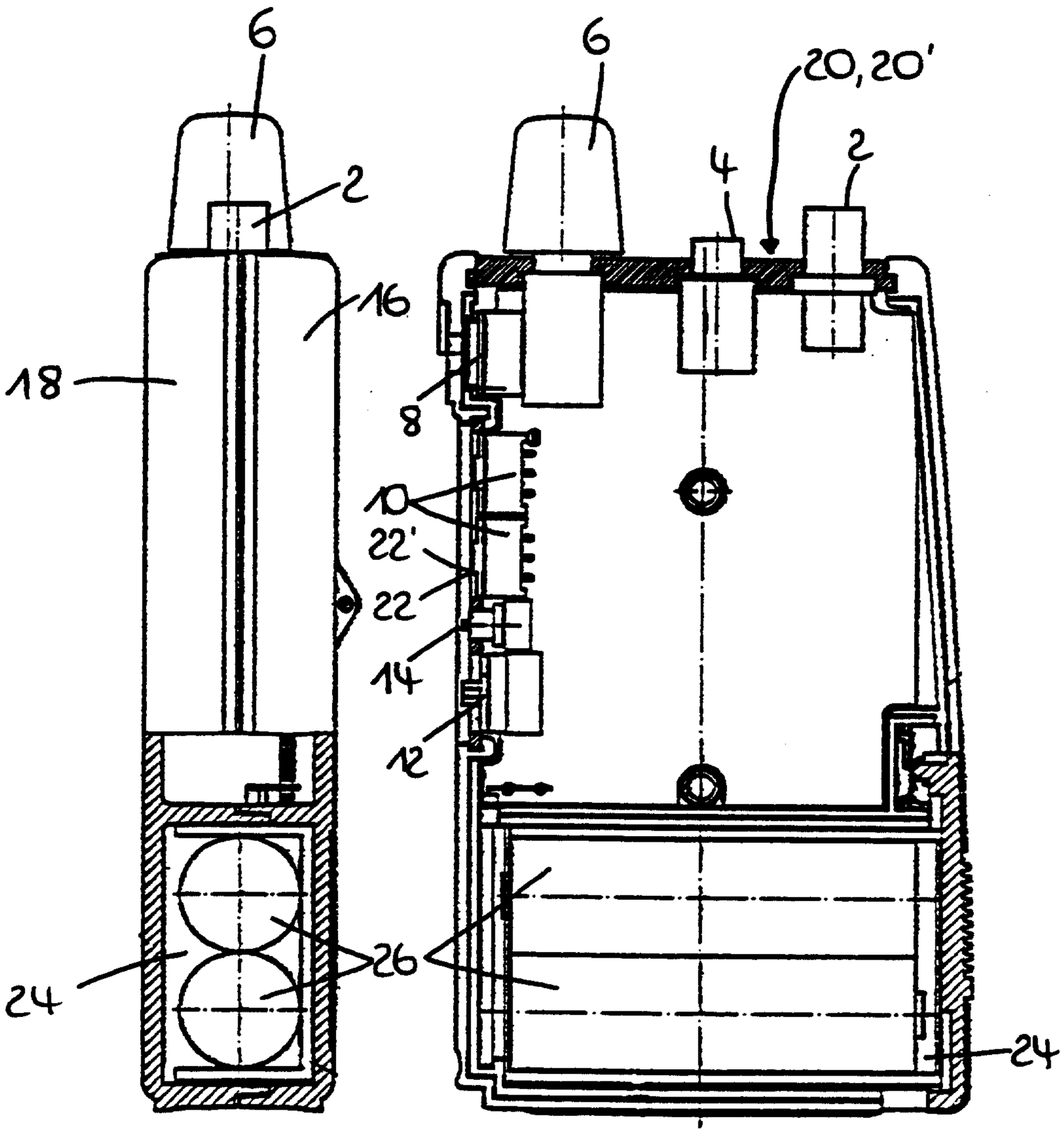


Fig.2

Fig.1

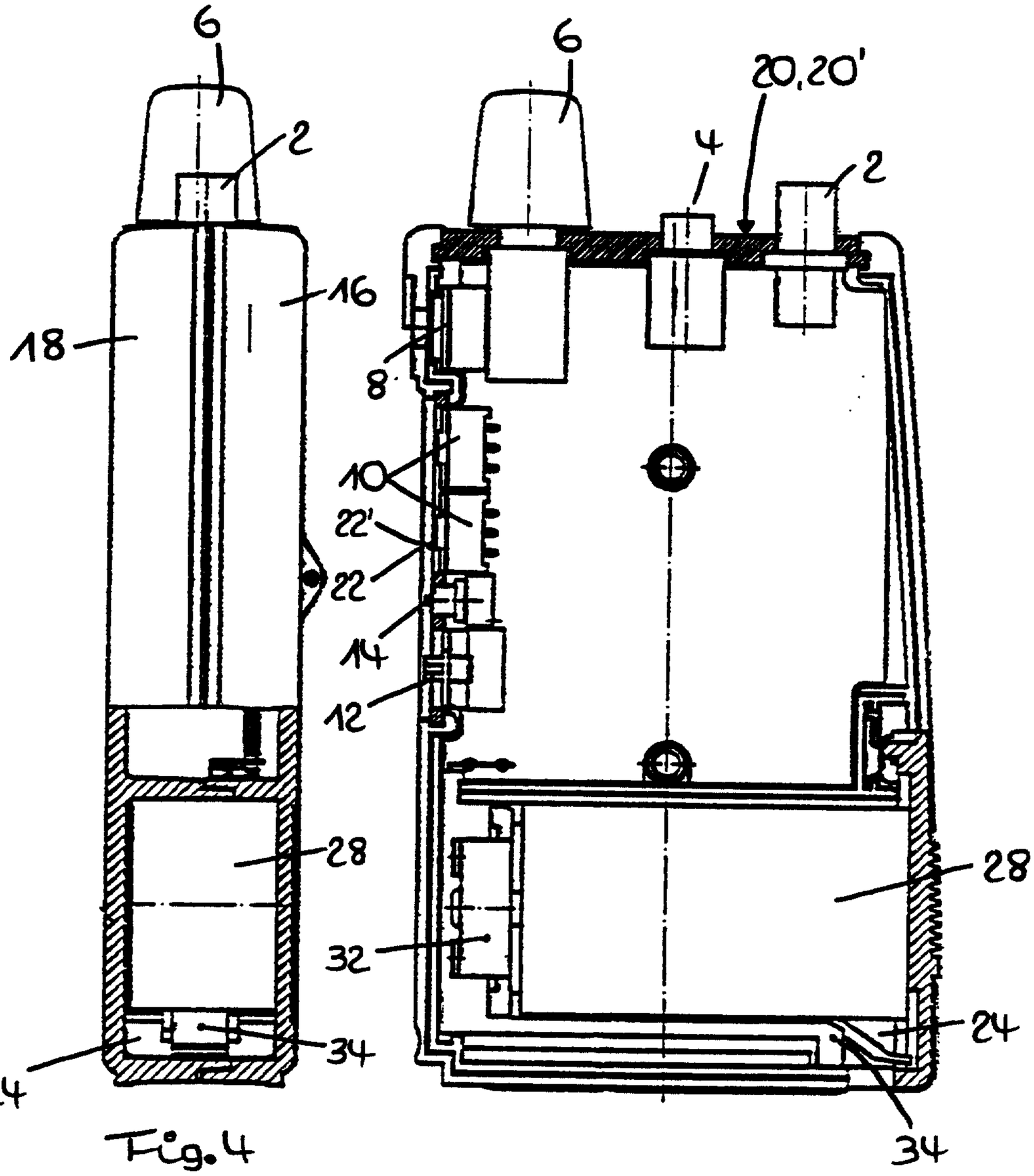


Fig. 4

Fig. 3

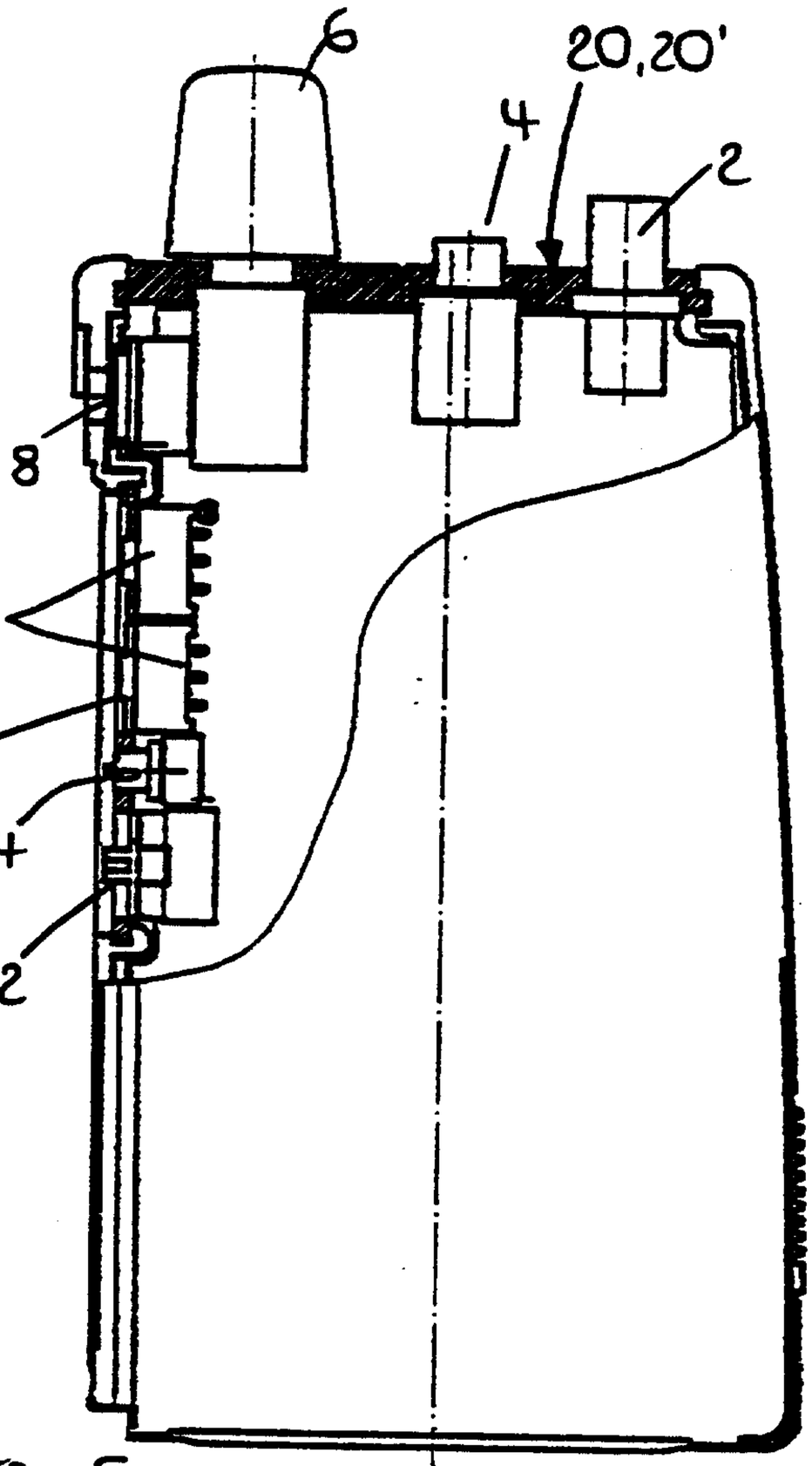


Fig.5

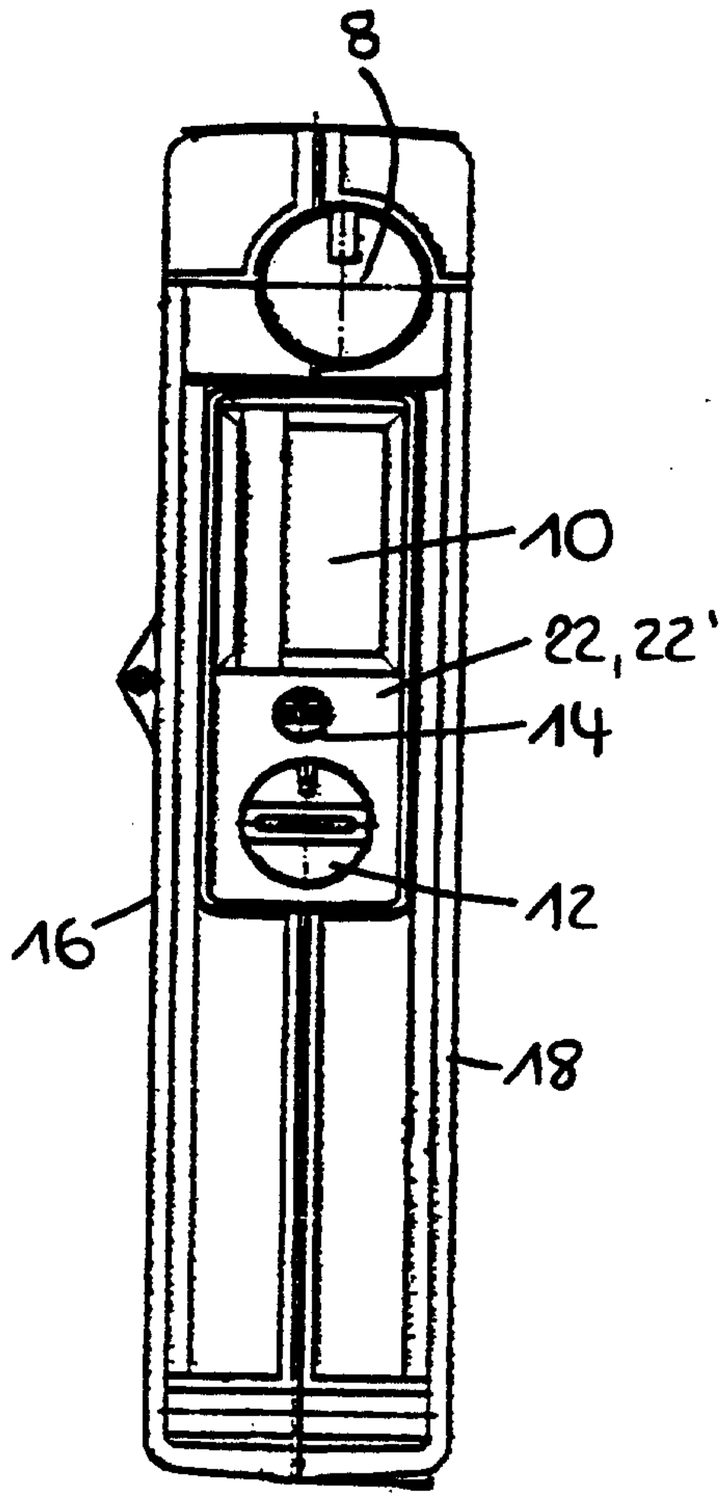


Fig.6

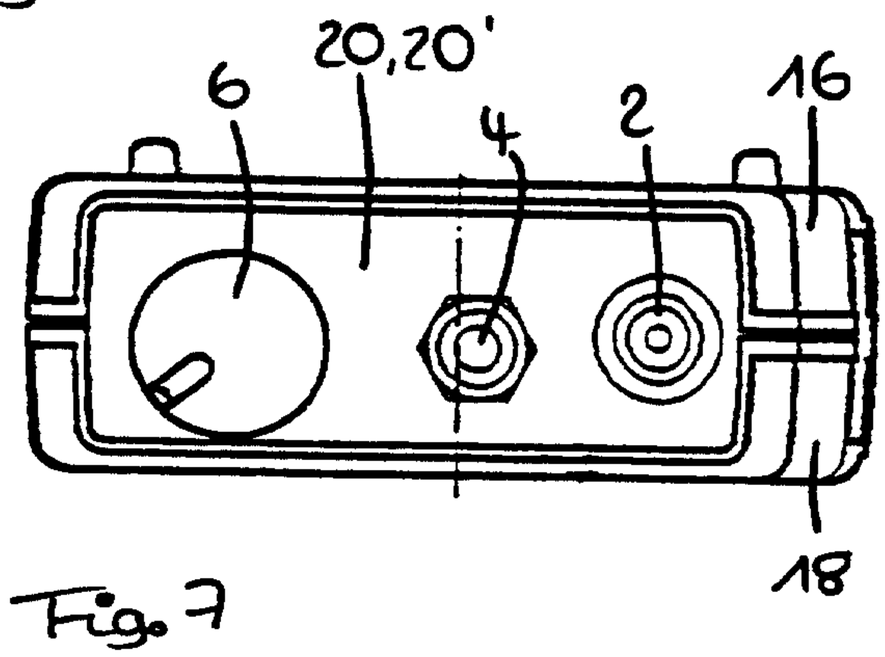
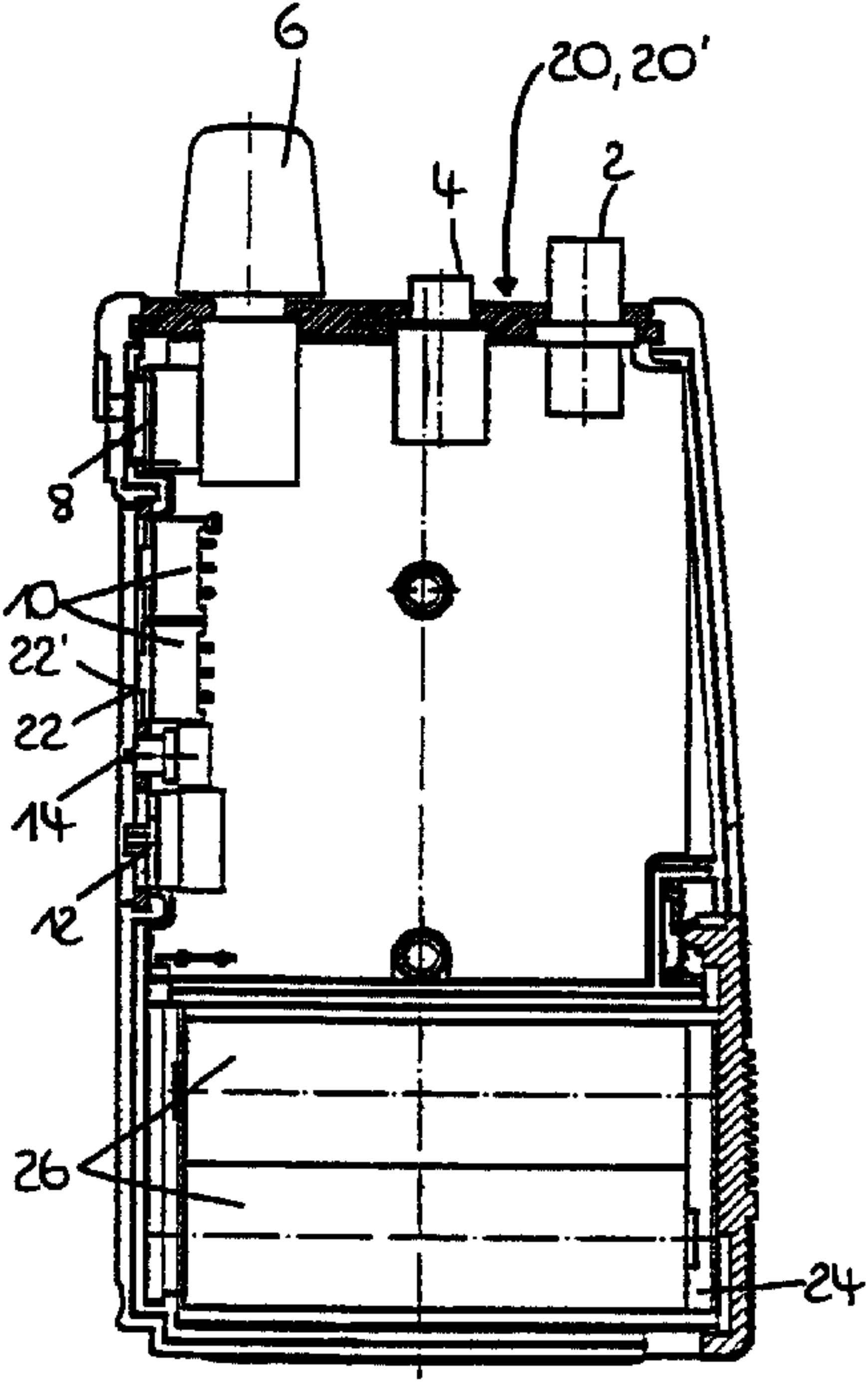


Fig.7


6
20, 20'
4
2
8
10
22'
22
14
12
26
24