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(54) **Control device for satellite antennae of vehicles**

(57) A control device for satellite antennae (A) of vehicles, comprising at least one operating unit (2) provided with at least one control element (3a, 3b), of the type of a button, a switch and the like, which can be associated functionally with a satellite antenna (A), which can be arranged on the top (B) of a vehicle, such as campers, truck campers, caravans, trucks, articulated trucks, and the like. The element (3a, 3b) can be actuated by a user to control the operation of the antenna (A).

The operating unit (2) has a shape and dimensions that are complementary to those of a containment box that is provided along a wall of the habitable compartment inside the vehicle, and to those of an opening (4) that is provided in a frame (5) having a rectangular contour, even of a commercial type, which can be arranged on the wall of the habitable compartment inside the vehicle.

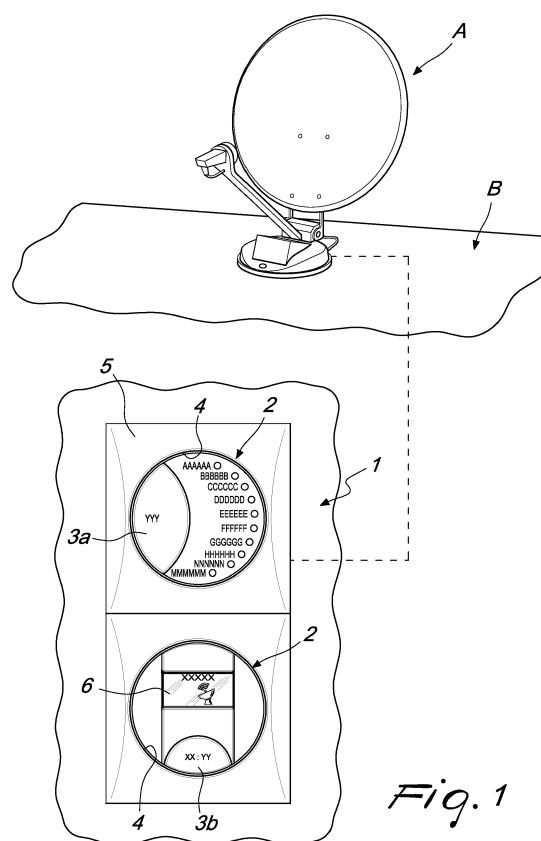


Fig. 1

Description

[0001] The present invention relates to a control device for satellite antennae of vehicles.

[0002] As is known, the use of the parabolic antennae capable of receiving television broadcasts from satellites located in geostationary orbit around the earth is already widespread.

[0003] More precisely, these apparatuses are used increasingly often to watch television programs in one's own home (or also in public places), but antennae of the above cited type are installed often on the top of campers, caravans and similar means of transport, again, obviously, in order to make it possible to watch the programs on a television set arranged inside.

[0004] In this last case, in order to ensure correct operation even after a displacement which causes loss of the previous alignment with the desired satellite, antennae usually allow motorized pointing: i.e., they are associated with movement means of various types, that allow easy modification of their orientation, in order to keep them pointed toward the satellite of interest and/or in order to be able to choose freely the one from which to receive the signal, among the many satellites available.

[0005] In order to allow, therefore, the control of the movement means, and more generally in order to communicate with the main unit (the antenna), the user who is inside the vehicle is provided with a control device, which is connected by radio or by cable to the other above-mentioned elements.

[0006] This constructive solution, however, is not free from drawbacks.

[0007] Control devices of the known type, marketed together with the antennae by their manufacturers, are in fact often fixed to a wall of the habitable compartment inside the vehicle.

[0008] Moreover, particularly if there is a cable connection between the antenna and the corresponding device, the latter has to be fixed to the wall at connection boxes (known also as "electric component boxes"), already prearranged by the manufacturer of the vehicle in order to allow the connection of other control instruments, such as buttons, thermostats, switches and the like, usually provided for switching lights on and off, for adjusting the temperature, etcetera.

[0009] It is clear, therefore, that it is often difficult to ensure compatibility between the control devices and the boxes already provided, since each manufacturer uses for them predefined dimensions and shapes, that seldom fit the shape of the above-mentioned devices, imposing therefore further adaptation work or the provision of further boxes from scratch, with obvious additional costs and inconvenience.

[0010] Moreover, it should be noted that the other instruments mentioned above also are installed by the manufacturer of the vehicle (directly or with the help of specialized companies), and therefore have usually a uniform design, in the shape and color of the buttons and

switches, but also in the frames (also called "covers") that house them and that allow practical fixing to the wall.

[0011] It is therefore clear that resorting to antenna control devices of the known type causes, along the walls, a juxtaposition between the former and the additional instruments mentioned above that is aesthetically unpleasant, because the former are not provided in accordance with the aesthetic styling chosen by the specific manufacturer of the camper or caravan.

[0012] The aim of the present invention is to solve the problems described above, by providing a control device for satellite antennae that can be installed easily on the walls of the internal habitable compartments of vehicles.

[0013] Within this aim, an object of the invention is to provide a control device that ensures a pleasant and eye-catching design, even if it is set next to other control instruments of any electrical and/or electronic apparatuses arranged in the vehicle.

[0014] Another object of the invention is to provide a control device whose shapes and dimensions conform to those usually adopted by the manufacturers of said vehicles for the other control instruments of electrical and/or electronic apparatuses.

[0015] A further object of the invention is to provide a control device that can be installed on the vehicle by using connection boxes already provided thereon and used for the connection of other control instruments of electrical and/or electronic apparatuses.

[0016] A further object of the invention is to provide a control device that ensures high reliability in use.

[0017] Another object of the invention is to provide a control device that can be obtained easily starting from commonly commercially available elements and materials.

[0018] Another object of the invention is to provide a control device that has low costs and is safe in application.

[0019] This aim and these and other objects are achieved by a control device for satellite antennae of vehicles, comprising at least one operating unit provided with at least one control element, of the type of a button, a switch and the like, which can be associated functionally with a satellite antenna, which can be arranged on the top of a vehicle, such as campers, truck campers, caravans, trucks, articulated trucks, and the like, said element being able to be actuated by a user to control the operation of the antenna, characterized in that said operating unit has a shape and dimensions that are complementary to those of a containment box that is provided along a wall of the habitable compartment inside the vehicle, and to those of an opening provided in a frame having a rectangular contour, optionally of a commercial type, which can be arranged on the wall of the habitable compartment inside the vehicle.

[0020] Further characteristics and advantages of the invention will become more apparent from the description of two preferred but not exclusive embodiments of the control device according to the invention, illustrated by

way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a schematic perspective front elevation view of the control device according to the invention in its first embodiment, associated with a satellite antenna;

Figure 2 is a schematic perspective front elevation view of the control device according to the invention in its second embodiment, associated with a satellite antenna.

[0021] With particular reference to the cited figures, the reference numeral 1 generally designates a control device for satellite antennae A of vehicles, which comprises at least one operating unit 2 provided in turn with at least one control element 3a, 3b, of the type of a button, a switch and the like (on the following pages, some possible types of control elements 3a, 3b will be explained merely by way of non-limiting example).

[0022] According to known methods, the control element 3a, 3b can be therefore associated functionally (by radio, by cable or other means) with a satellite antenna A, which can be arranged on the top B of a vehicle, such as campers, truck campers, caravans, trucks, articulated trucks, and the like; said element 3a, 3b can thus be actuated by a user to control the operation of the antenna A.

[0023] Therefore, it is specified right now that in the preferred application to which reference shall be made hereinafter the device 1 is assigned to the control of satellite antennae A intended to be used on campers, truck campers and caravans. The use of the device 1 in association with satellite antennae A installed on trucks, articulated trucks and more generally on any vehicle capable of traveling even over long distances and at the same time of allowing one or more people to dwell inside it is not excluded (for example, therefore, the antenna A can also be installed on small or large boats).

[0024] It should be noted that typically the satellite antenna A is of the type with motorized pointing, i.e., it can be associated for example with a polar rotor or with a piston actuator with polar mount, in order to allow the selective modification of its orientation and thus be able to vary at will the region of space at which it is pointed.

[0025] Indeed the control of the means assigned to changing the orientation of the antenna A (and likewise for example its switching on and off) constitutes a possible function of at least one control element 3a, 3b and more generally of the at least one operating unit 2, which can therefore communicate and interact with the antenna A (typically by means of a control unit, or similar apparatus, with which it is provided and which controls it).

[0026] Moreover, according to known methods, the antenna A can be controlled by a satellite receiver (for example, a digital decoder), capable of decoding the signal sent by the satellite at which said antenna A is pointed, in order to allow its viewing on a satellite television set

that can be connected to the receiver and arranged inside the vehicle.

[0027] According to the invention, the operating unit 2 has a shape and dimensions that are complementary to those of a containment box, optionally of a known type, that is provided along a wall of the habitable compartment inside the vehicle, and to those of an opening 4 that is provided in a frame 5 having a rectangular contour, optionally of a commercial type, which can be arranged on the wall of the habitable compartment inside the vehicle (i. e. at the box).

[0028] The containment box, therefore, can be of the type known as electrical component box, usually already prearranged (in one or more points of the vehicle) by the manufacturer of the vehicle in order to accommodate electrical components such as electrical sockets, switches, thermostats and the like, which in turn are preset for the adjustment and control of the lights, the temperature, etcetera.

[0029] Furthermore, it is specified right now that the "rectangular" attribute of the contour of the frame 5 is to be understood in its broadest meaning, identifying therefore any convex quadrilateral having four right angles: the frame 5 might therefore be also square without thereby abandoning the protective scope claimed herein. Said frame 5 can be also anchored to the wall (and/or to the operating unit 2) and enclose said operating unit 2 on the outside when both are fixed to the wall, at the respective box.

[0030] In particular, according to a first embodiment, shown in the accompanying figures by way of non-limiting example, the operating unit 2 has a substantially circular contour, so that it can enter stably a respective opening 4, having a complementary shape and dimensions, of the frame 5.

[0031] More particularly, the operating unit 2 having a substantially circular contour has a diameter comprised between 30 mm and 50 mm and preferably has a diameter equal to 41 mm (obviously, these measurements may have suitable tolerances).

[0032] In this first embodiment, therefore, the operating unit 2 is constituted substantially by a substantially disk-like external shell (or otherwise cylindrical and flattened) that accommodates on its inside the electrical/electronic components necessary for its operation. The control element 3a, 3b can therefore be arranged on a first circular surface that is formed by the shell and which, when the device 1 is fixed to the respective wall, faces the habitable compartment, while on the opposite side the shell can be provided with means for connection and fixing to the accommodation box and/or to the antenna A or simply to the wall.

[0033] In a second embodiment, which does not exhaust the possible shapes that are however within the protective scope claimed herein, the operating unit 2 has a substantially square contour, optionally with rounded corners, so that it can thus be inserted stably in a respective opening 4, having a complementary shape and di-

mensions, of the frame 5.

[0034] More particularly, the operating unit 2 having a substantially square contour, optionally with rounded corners, has a side comprised between 30 mm and 60 mm and preferably has a side equal to 45 mm (obviously, these measures may have suitable tolerances).

[0035] In a manner similar to what has been noted for the first embodiment, therefore, in the second embodiment introduced above the operating unit 2 is constituted substantially by a substantially parallelepipedal (flattened) external shell that accommodates on its inside the electrical/electronic components necessary to its operation. The control element 3a, 3b is arranged on one of the large faces that is formed by the shell and that when the device 1 is fixed to the respective wall faces the habitable compartment, while on the opposite side the shell can again be provided with means for connection and fixing to the accommodation box and/or to the antenna A, or simply to the wall.

[0036] Conveniently, the operating unit 2 can comprise a screen 6 to allow the display of icons and/or information and/or animations relating to the operation of the antenna A.

[0037] In a first mode of commercialization of the device 1 according to the invention, the device comprises only one operating unit 2 (or two, or more), allowing therefore the user to find on the market frames 5 of the commercial type, which will be absolutely compatible with the operating unit 2, due to the specific shapes and dimensions selected for the latter.

[0038] In a different mode of commercialization, which, like the previous one, is within the protective scope claimed herein, the device 1 comprises the frame 5 with rectangular contour (optionally chosen of the type similar to the ones available on the market, in order to allow easy replacement in case of breakage or wear and ensure the additional advantages that will be highlighted hereinafter), provided with the opening 4, in which therefore it is possible to insert the operating unit 2, whose shape and dimensions are complementary to those of said opening 4.

[0039] In a constructive solution of considerable practical interest, proposed in the accompanying figures by way of non-limiting example of the application of the invention, the frame 5 has two openings 4, so as to be able to insert therein two respective operating units 2. These openings 4 are mutually spaced according to a predefined value, which is comprised between 10 mm and 30 mm and chosen preferably equal to 18 mm (in this case also, these values may provide suitable tolerances).

[0040] As is evident from the accompanying figures, the two openings 4, in the configuration for use (i.e., when the frame 5 is applied on the desired wall), can be mutually aligned along a vertical axis (as in Figure 1) or a horizontal axis (as in Figure 2).

[0041] It is therefore appropriate to note that the accompanying figures show, in both of the illustrated embodiments, possible types of control elements 3a, 3b,

and more generally a possible configuration of the latter, and of the operating units 2.

[0042] Therefore, merely by way of example, it is noted that the control device 1 according to the invention has, in a first operating unit 2, a first control element 3a constituted by a button capable of controlling the movement of the associated satellite antenna A, in order to direct it toward a predefined satellite (the information necessary for this purpose being already stored in the antenna A, or in any case in the respective control unit).

[0043] More precisely, by pressing sequentially the button it is possible to select in series a respective plurality of satellites, optionally listed next to the button (and flanked by a respective LED, which can light up when the corresponding satellite is selected).

[0044] Moreover, in a second operating unit 2 accommodated in a second opening 4 of the same frame 5 the device 1 has a second control element 3b, which can be simply intended to switch the antenna A on and off.

[0045] Moreover, the second control element 3b is provided with a screen 6, by means of which information of different types (and/or any error messages) on the operational status of the antenna A itself is displayed.

[0046] The use of the control device according to the invention is therefore evident from what has been described so far: the control device 1 (and in particular the operating units 2 with the corresponding frame 5), can be applied on a wall of the internal habitable compartment of a camper or a caravan (or other vehicle), so as to allow an occupant to control the satellite antenna A installed on the top B of the vehicle.

[0047] The specific shape chosen for the operating units 2 makes it possible advantageously to easily accommodate and install them in boxes (known also as electrical component boxes) of the known type, that have complementary shapes and dimensions, already widespread because they have been adopted by some manufacturers of campers, truck campers, caravans and the like, in order to accommodate electrical components such as switches for switching on and off the lights, thermostats and similar instruments.

[0048] This allows limiting to a minimum the operations for installation and assembly, without requiring expensive and complicated work for adaptation and/or for providing links and connections prepared for this purpose.

[0049] Likewise, the shape chosen allows also the use of standard-shaped frames 5, also easily commercially available (or manufactured specifically, so as to be identical to those on the market), and designed to accommodate, in the respective openings 4, the operating units 2, at the above-mentioned boxes.

[0050] It is evident, moreover, that after installation has been performed, the control device 1 ensures certainly a pleasant and eye-catching design, when it is put close/set next to other control instruments of electrical and/or electronic apparatuses, optionally placed in the vehicle, thanks to the use of the frames 5 of the same type as those adopted for the light switches, the thermo-

stats for adjusting the temperature, etcetera, ensuring thereby an overall uniform and therefore pleasant appearance.

[0051] In practice it has been found that the control device according to the invention achieves fully the intended aim, since the use of an operating unit that has at least one control element, of the type of a button, a switch and the like, whose shape and dimensions are complementary to those of a containment box, optionally of a known type, that is provided along a wall of the habitable compartment inside the vehicle, and to those of an opening provided in a frame having a rectangular contour, optionally of a commercial type, which can be arranged on the wall of the habitable compartment inside the vehicle, allows the provision of control devices for satellite antennae that can be installed easily on the walls of the inner habitable compartments of vehicles.

[0052] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may furthermore be replaced with other technically equivalent elements.

[0053] In the exemplary embodiment shown, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiment.

[0054] In practice, the materials used, as well as the dimensions, may be any according to the requirements and the state of the art.

[0055] The disclosures in Italian Patent Application No. BO2013A000497 from which this application claims priority are incorporated herein by reference.

[0056] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A control device for satellite antennae (A) of vehicles, comprising at least one operating unit (2) provided with at least one control element (3a, 3b), of the type of a button, a switch and the like, which can be associated functionally with a satellite antenna (A), which can be arranged on the top (B) of a vehicle, such as campers, truck campers, caravans, trucks, articulated trucks, and the like, said element (3a, 3b) being able to be actuated by a user to control the operation of the antenna (A), **characterized in that** said operating unit (2) has a shape and dimensions that are complementary to those of a containment box that is provided along a wall of the habitable compartment inside the vehicle, and to those of an opening (4) that is provided in a frame (5) having a

rectangular contour, even of a commercial type, which can be arranged on the wall of the habitable compartment inside the vehicle.

2. The control device according to claim 1, **characterized in that** said at least one operating unit (2) has a substantially circular contour, for stable insertion in an opening (4), having a complementary shape and dimensions, of the frame (5).
3. The control device according to claim 2, **characterized in that** said at least one operating unit (2) having a substantially circular contour has a diameter comprised between 30 mm and 50 mm and preferably has a diameter equal to 41 mm.
4. The control device according to claim 1 and as an alternative to claim 2, **characterized in that** said at least one operating unit (2) has a substantially square contour, optionally with rounded corners, for stable insertion in an opening (4), having a complementary shape and dimensions, of the frame (5).
5. The control device according to claim 4, **characterized in that** said at least one operating unit (2) having a substantially square contour, optionally with rounded corners, has a side comprised between 30 mm and 60 mm and preferably has a side equal to 45 mm.
6. The control device according to one or more of the preceding claims, **characterized in that** said at least one operating unit (2) comprises a screen (6), for displaying icons and/or information and/or animations relating to the operation of the antenna (A).
7. The control device according to one or more of the preceding claims, **characterized in that** it comprises said frame (5) having a rectangular contour, provided with said at least one opening (4), for the insertion of said at least one operating unit (2), having a shape and dimensions that are complementary to those of said at least one opening (4).
8. The control device according to one or more of the preceding claims, **characterized in that** said frame (5) has two of said openings (4), for the insertion of said respective operating units (2), said openings (4) being mutually spaced according to a predefined value.
9. The control device according to claim 8, **characterized in that** said openings (4) are mutually spaced according to a predefined value comprised between 10 mm and 30 mm and chosen preferably equal to 18 mm.

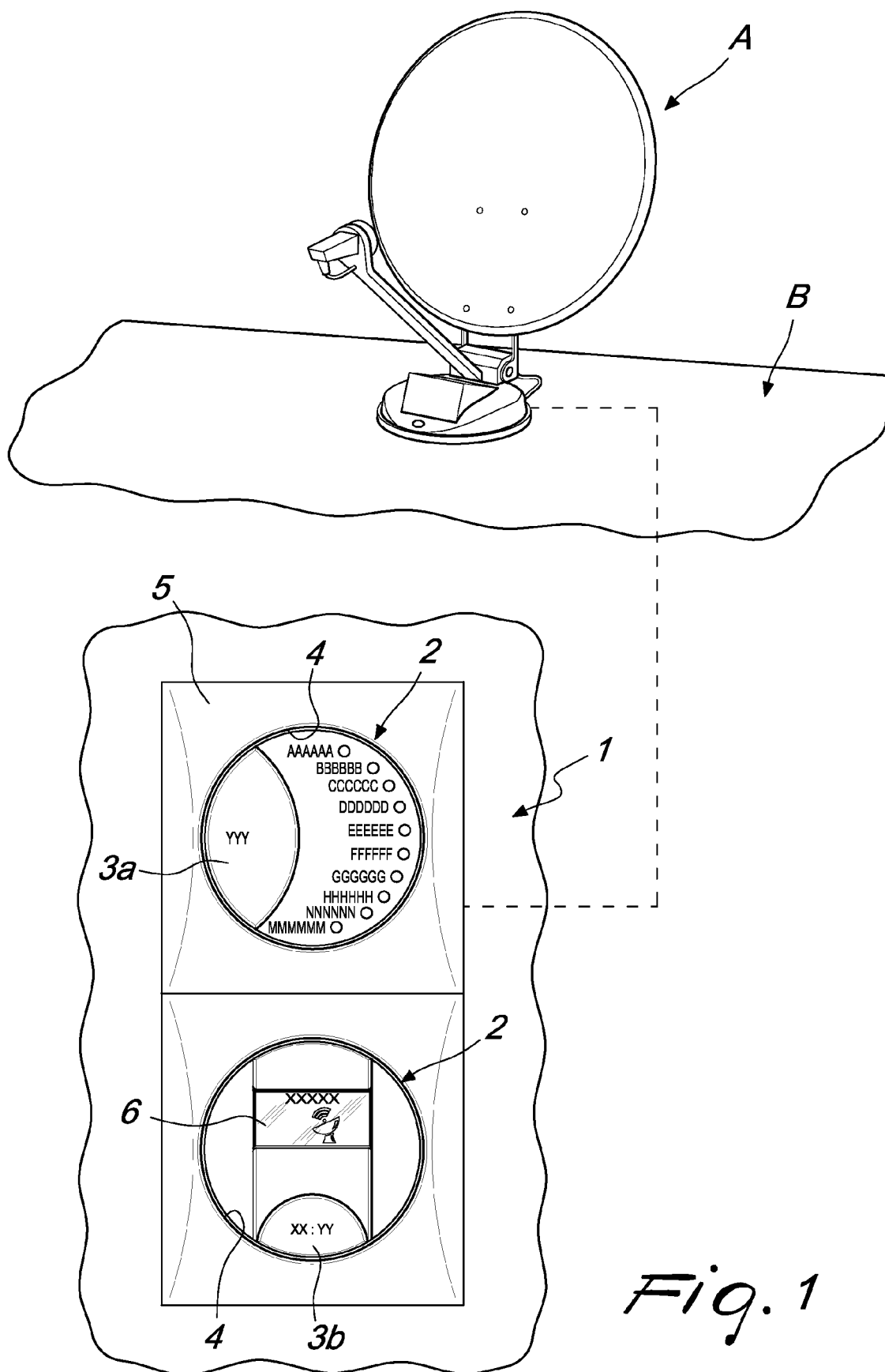


Fig. 1

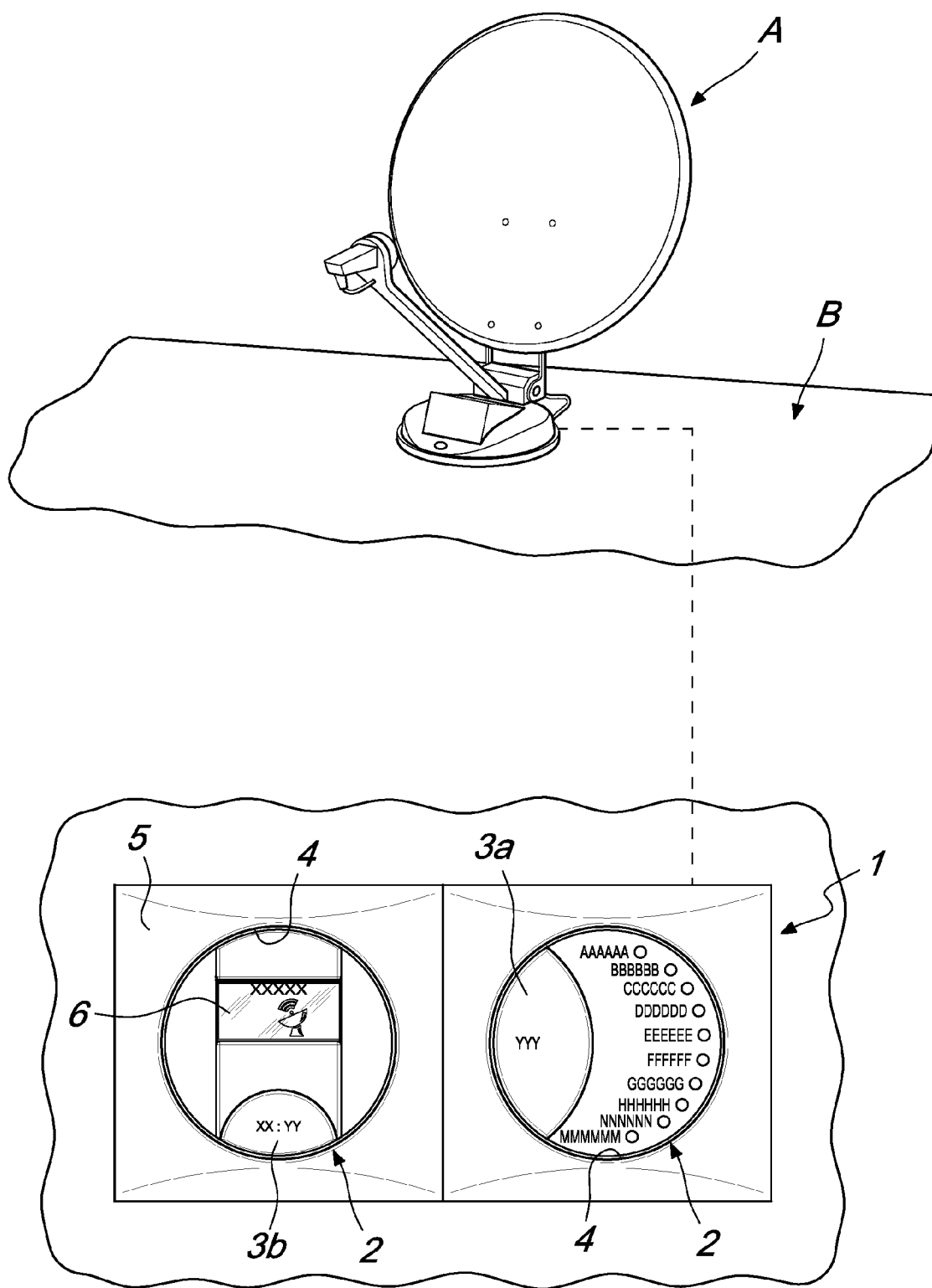


Fig. 2



EUROPEAN SEARCH REPORT

Application Number
EP 14 18 4382

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 October 2014	Examiner van Norel, Jan
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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