

Front panel of an electronic apparatus, provided with a push-button

The present invention relates to a front panel intended to be mounted on the front surface of an electronic home-entertainment apparatus, which front surface carries an actuating rod which projects from said surface and is actuated by pushing, which front panel is provided with a slide button secured to it and arranged so as to be disposed opposite
5 the actuating rod when the front panel has been mounted on the apparatus.

Such a detachable front panel is known from the document EP 0,566,128. In accordance with said document a removable front panel carries push-buttons corresponding to push-buttons which project from the front surface of the chassis, for
10 controlling a cassette player.

It is an object of the invention to improve the operation of the control keys or buttons.

To this end, the front panel has been provided with a spring which tends
15 to urge the slide button into the front panel.

Since in certain modes of the cassette player the actuating rod remains depressed halfway, the spring ensures that the slide button is always in engagement with the rod, even when it is depressed halfway, which precludes "floating" of the button or vibrations.

Moreover, if the front panel is of an anti-theft type which can be removed
20 by a user, the button is moved inward under the influence of the spring when the front panel is removed: there is no part which projects from the front panel and which could be caught, for example, in a pocket of the user.

It is advantageous if the thickness of the front panel, on the one hand, and
25 the length of the button, on the other hand, are such that the button, when depressed, is disposed almost wholly inside the front panel.

Thus, the button can disappear completely inside the front panel when this panel is removed.

It is advantageous if the spring is a hairpin spring, which can have one



limb which engages a transverse hole of the button.

A front panel in accordance with the invention is particularly suitable for use in a car-radio receiver having a front panel which carries an actuating rod which projects from said panel and is actuated by pushing.

5 The actuating rod is for example an actuating rod of a cassette player.

These as well as other more detailed aspects of the invention will be apparent from the following description of an embodiment given by way of non-limitative example.

10 Figure 1 shows a part of a car-radio receiver with elements of the invention, inter alia a part of a removable front panel.

Figure 2 shows a part of the removable front panel of the car-radio receiver of Figure 1, while removed from the receiver and with a slide button pressed into it.

15 It is evident that the invention, which will be described hereinafter in connection with a car-radio receiver having an detachable anti-theft front panel, can likewise be applied to any other type of apparatus and is still advantageous even if the front panel is not of the anti-theft type which is removable by the user.

20 The removable front panel of a car-radio receiver, which is shown partly in Figure 1, is made up of two elements, i.e. a front wall 1 (facing the user), turned to the left in the Figure, and a rear wall 11, adapted to be applied to at least a part of the front surface of the apparatus. The front panel carries a control button 2, which projects from the front wall 1.

25 The receiver chassis is formed by a housing which accommodates the most bulky elements of the receiver, such as a known cassette-player deck, not shown. The front surface of the chassis is symbolized by a line 12. The end 3 of an actuating rod projects from this front surface, which rod serves to control a function of the cassette reader, for example cassette ejection or fast winding. The rod 3 is made of a metal and its end is covered by a cap 4 of a plastic material. It has such a length that its end is disposed approximately halfway the thickness of the front panel.

30 The button 2 is mounted to be slidable in the front panel 1. In order to ensure a satisfactory mechanical mounting, the button is provided with a guide member 5,9 which allows it to slide in a support inside the front panel, and with a shoulder 10, which prevents the button from being moved out through the front wall of the front panel.

Numerous variants of such a guide system are known to or are conceivable by those skilled



in the art. The button 2 can be pushed towards the right in Figure 1. It has a recess 6 forming a kind of tunnel through the body of the button, in which a limb of a hairpin spring 7 engages, which spring is also fastened to the front panel by means of a holder 8. The spring is tensioned so as to urge the button to the right in the Figure, i.e. towards the front side of the chassis.

When the front panel has been mounted, as shown in Figure 1, the button 2 faces the end of the actuating rod 3, and when the button is pushed the actuating rod is depressed.

When the front panel has been removed, as shown in Figure 2, the button 2 is urged into the front panel under the influence of the spring 7 and no longer projects from the front wall 1. The front panel has a thickness of the same order as the length of the button and the button is then disposed almost wholly inside the front panel.

Some variants can be easily imagined. For example, the spring can have two limbs that engage on both sides of the button, instead of one limb engaging a transverse hole. A sole spring could be used for two contiguous buttons, having a central support and two synetrical limbs, each of them engaging a transverse hole of a button.



CLAIMS:

1. A front panel intended to be mounted on the front surface of an electronic home-entertainment apparatus, which front surface carries an actuating rod which projects from said surface and is actuated by pushing, which front panel is provided with a slide button secured to it and arranged so as to be disposed opposite the actuating rod when the
- 5 front panel has been mounted on the apparatus, characterized in that the front panel has been provided with a spring which tends to urge the slide button into the front panel.
2. A front panel as claimed in Claim 1, characterized in that the thickness of the front panel, on the one hand, and the length of the button, on the other hand, are such that the button, when depressed, is disposed almost wholly inside the front panel.
- 10 3. A front panel as claimed in Claim 1, characterized in that the spring is a hairpin spring.
4. A front panel as claimed in Claim 1, characterized in that the spring is a hairpin spring having one limb which engages a transverse hole of the button.
5. A car-radio receiver having a front panel which carries an actuating rod
- 15 which projects from said panel and is actuated by pushing, characterized in that it is equipped with a front panel as claimed in any one of the Claims 1 to 4.



ABSTRACT

"Front panel of an electronic apparatus, provided with a push-button

A front panel (1) carries a push-button (2) corresponding to an actuating rod (3) which projects from the front surface of the chassis of the electronic apparatus. The push-button (2) has been provided with a spring (7) which urges the button against the actuating rod and causes it to be moved into the front panel if the latter is removed from the
5 apparatus.

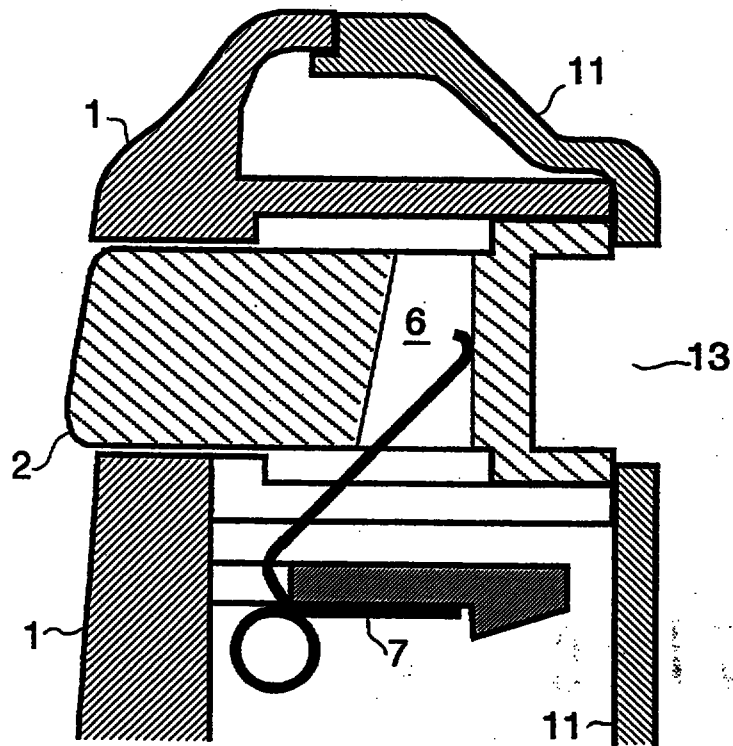
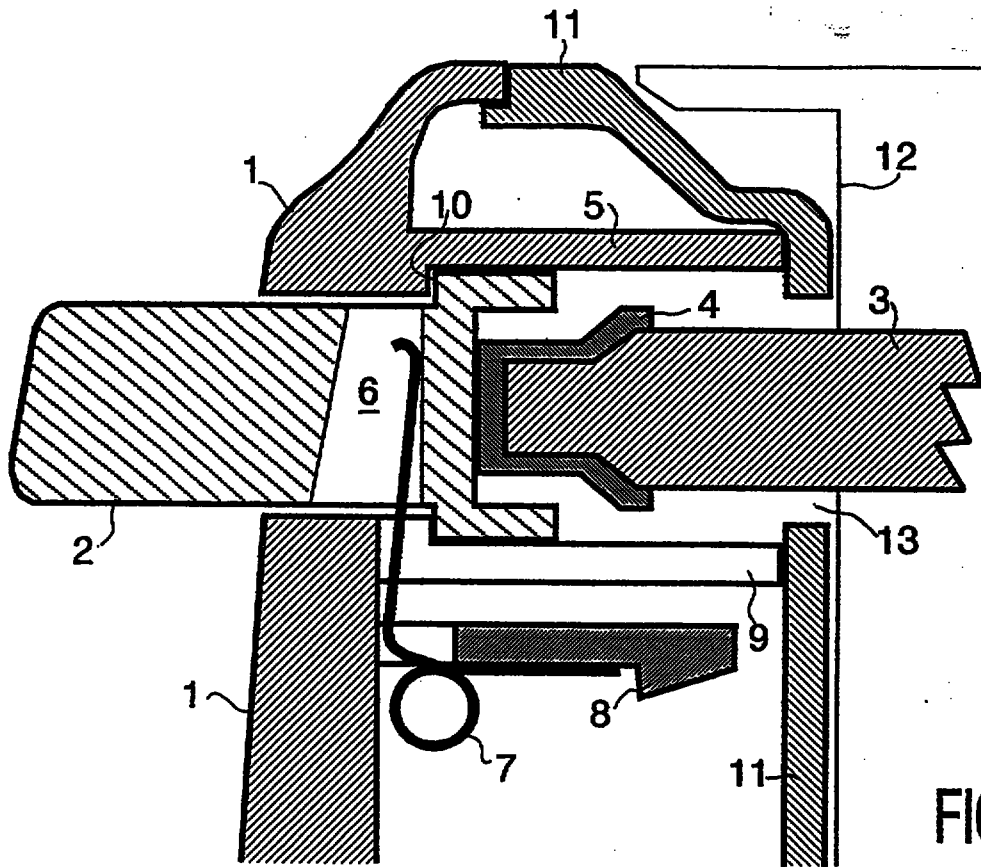
Used, for example, in a car-radio for controlling a cassette player.

Figure 1.

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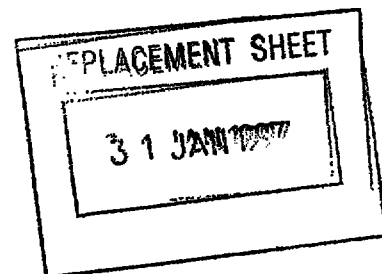


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Such a detachable front panel is known from the document EP 0,566,128. In accordance with said document a removable front panel carries push-buttons corresponding to push-buttons which project from the front surface of the chassis, for controlling a cassette player.

It is an object of the invention to improve the operation of the control keys or buttons.

To this end, the front panel has been provided with a spring which tends to urge the slide button into the front panel.

Since in certain modes of the cassette player the actuating rod remains depressed halfway, the spring ensures that the slide button is always in engagement with the rod, even when it is depressed halfway, which precludes "floating" of the button or vibrations.

Moreover, if the front panel is of an anti-theft type which can be removed by a user, the button is moved inward under the influence of the spring when the front panel is removed: there is no part which projects from the front panel and which could be caught, for example, in a pocket of the user.

It is advantageous if the thickness of the front panel, on the one hand, and the length of the button, on the other hand, are such that the button, when depressed, is disposed almost wholly inside the front panel.

Thus, the button can disappear completely inside the front panel when this panel is removed.

It is advantageous if the spring is a hairpin spring, which can have one

limb which engages a transverse hole of the button.

A front panel in accordance with the invention is particularly suitable for use in a car-radio receiver having a front panel which carries an actuating rod which projects from said panel and is actuated by pushing.

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30 The button 2 is mounted to be slidable in the front panel 1. In order to ensure a satisfactory mechanical mounting, the button is provided with a guide member 5,9 which allows it to slide in a support inside the front panel, and with a shoulder 10, which prevents the button from being moved out through the front wall of the front panel. Numerous variants of such a guide system are known to or are conceivable by those skilled

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in the art. The button 2 can be pushed towards the right in Figure 1. It has a recess 6 forming a kind of tunnel through the body of the button, in which a limb of a hairpin spring 7 engages, which spring is also fastened to the front panel by means of a holder 8. The spring is tensioned so as to urge the button to the right in the Figure, i.e. towards the front side of the chassis.

When the front panel has been mounted, as shown in Figure 1, the button 2 faces the end of the actuating rod 3, and when the button is pushed the actuating rod is depressed.

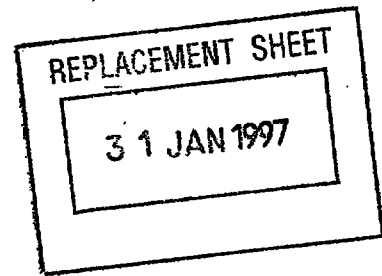
When the front panel has been removed, as shown in Figure 2, the button 2 is urged into the front panel under the influence of the spring 7 and no longer projects from the front wall 1. The front panel has a thickness of the same order as the length of the button and the button is then disposed almost wholly inside the front panel.

Some variants can be easily imagined. For example, the spring can have two limbs that engage on both sides of the button, instead of one limb engaging a transverse hole. A sole spring could be used for two contiguous buttons, having a central support and two symmetrical limbs, each of them engaging a transverse hole of a button.

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2. A front panel as claimed in Claim 1, characterized in that the thickness of the front panel, on the one hand, and the length of the button, on the other hand, are such that the button, when depressed, is disposed almost wholly inside the front panel.
- 10 3. A front panel as claimed in Claim 1, characterized in that the spring is a hairpin spring.
4. A front panel as claimed in Claim 1, characterized in that the spring is a hairpin spring having one limb which engages a transverse hole of the button.
5. A car-radio receiver having a front panel which carries an actuating rod which projects from said panel and is actuated by pushing, characterized in that it is equipped with a front panel as claimed in any one of the Claims 1 to 4.
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Used, for example, in a car-radio for controlling a cassette player.

Figure 1.

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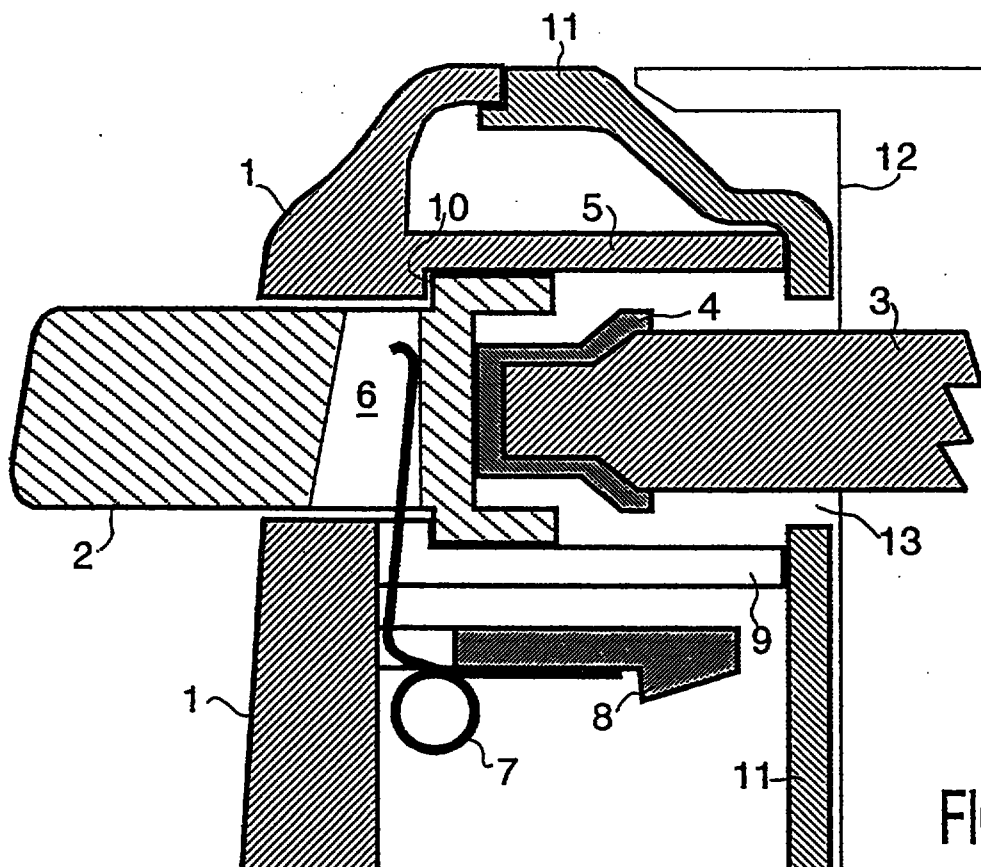


FIG. 1

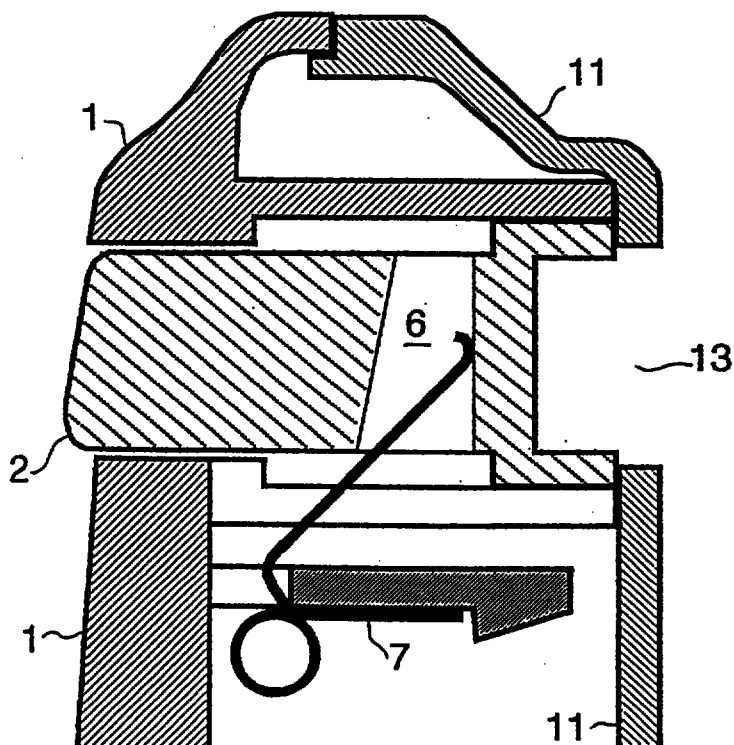


FIG. 2