

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
2 October 2003 (02.10.2003)

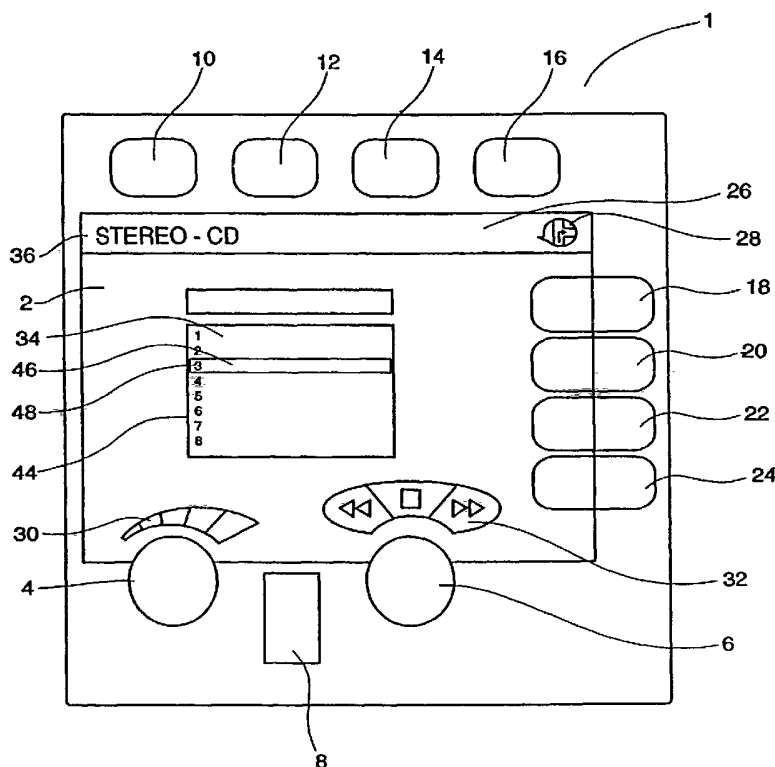
PCT

(10) International Publication Number  
WO 03/080391 A2

- (51) International Patent Classification<sup>7</sup>: **B60R** **SIDENVALL, Carl** [SE/SE]; Professorsvägen 25:3, S-977 54 Luleå (SE).
- (21) International Application Number: PCT/SE03/00464
- (22) International Filing Date: 20 March 2003 (20.03.2003)
- (25) Filing Language: Swedish
- (26) Publication Language: English
- (30) Priority Data: 0200909-0 22 March 2002 (22.03.2002) SE
- (71) Applicant (for all designated States except US): **SCANIA CV AB (publ)** [SE/SE]; S-151 87 Södertälje (SE).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **RUNEFELT, Daniel** [SE/SE]; Västergatan 25, 5 tr, S-151 45 Södertälje (SE).
- (74) Agent: **SJÖGREN, Stina**; Scania CV AB, Patents, S-151 87 Södertälje (SE).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: MULTI FUNCTION DEVICE FOR A VEHICLE



(57) Abstract: The invention relates to a multi-function unit 1 for vehicle, and to a vehicle provided with same, which multi-function unit 1 incorporates a display screen 2 and at least one mechanical knob 4,6 which at least partly overlaps the display screen 2 and which when subjected to rotation causes a change in a software-controlled representation 30,32,56,58,84,86,88,90,92,94,96,98 of the function of the knob 4,6 on the display screen 2. The multi-function unit 1 preferably further incorporates at least one roller wheel 8 which when subjected to rotation causes a change in a software-controlled representation

34,44,46,48,50,52,54,56,60,62,64,66,68,70,78,80 of the function of the roller wheel 8 on the display screen 2, and at least one means 18,20,22,24 for switching on and off a device which is represented on the display screen 2. The multifunction unit 1 preferably further incorporates at least one system selector button 10,12,14,16 by which the function of the aforesaid at least one knob 4,6, the function of the aforesaid at least one roller wheel 8 and the function of the aforesaid at least one means 18,20,22,24 respectively can be changed. Preferably at least one of the aforesaid at least knob 4,6 and/or the aforesaid at least one roller wheel 8 may be provided with tactile feedback by the knob 4,6 and/or the roller wheel 8 being arranged stepwise with resistance between steps.

WO 03/080391 A2



European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

— *without international search report and to be republished upon receipt of that report*

## MULTI FUNCTION DEVICE FOR A VEHICLE

## Technical field

- 5 The present invention relates to a multi-function unit for a vehicle, which multi-function unit incorporates a display screen.

## Background

- 10 A known practice in vehicles is to arrange multi-function units in which two or more systems are accommodated in one and the same unit. One reason is to save space in that there is no need for each of the systems to occupy space of its own, e.g. on an instrument panel arranged in the driving cab or interior of the vehicle. Another reason is to reduce the number of control means so that certain control means can be used by
- 15 two or more systems. Systems which can thus be combined comprise, for example, stereo systems with radio and CD player, navigation system, airconditioning, journey computer and telephone.

- An example of a multi-function unit, provided with display screen, for a vehicle is
- 20 referred in EP 0 993 995 A1, which refers to control buttons placed in the edge of the display screen. The control buttons appear to continue out onto the display screen by being represented optically on the display screen on the portion of the display screen situated closest to the control buttons. The functions of the control buttons on the display screen in the form of function symbols are also referred to.

- 25
- A problem with existing multi-function units as above is that multi-function units produced by different manufacturers exhibit different interfaces which, particularly if a large number of systems are to be integrated in a multi-function unit, may become relatively complicated, and that the control buttons are situated at different points and
- 30 present different functionalities in multi-function units produced by different manufacturers, thereby not facilitating user recognition as in the case of traditionally designed mechanical airconditioning, lighting panel and radio installations. A further

problem is that multi-function units with control buttons, as in EP 0 993 995 A1, are not suitable for step-by-step control of functions but rather for control of functions which have two positions, e.g. an “on” position and “off” position.

## 5 Brief description of the invention

The problem that multi-function units produced by different manufacturers present different interfaces and that the control buttons are situated at different positions and present different functionalities and thereby do not facilitate user recognition is solved  
10 according to the invention by arranging a multi-function unit for vehicle, which multi-function unit incorporates a display screen and at least one, but preferably two, knobs.

The problem that multi-function units with control buttons are not suitable for step-by-step control of functions but rather for control of functions which have two positions is  
15 solved according to the invention by arranging a multi-function unit for vehicle, which multi-function unit incorporates a display screen and at least one, but preferably two, knobs.

The multi-function unit incorporating the features in claim 1 affords the advantage of  
20 providing a multi-function unit which resembles traditionally designed mechanical airconditioning, lighting panel and radio installations which facilitate user recognition by conforming to usual patterns, thereby creating user confidence in the relatively complicated interface. Another advantage is that the multi-function unit is suitable for step-by-step control of functions. A further advantage is that the knob/knobs is/are  
25 mechanical and at least partly overlaps/overlap the display screen and that rotating it/them changes the software-controlled representations of its/their functions on the display screen and provides an approximation between input and feedback, thereby reducing the cognitive load on the driver through high compatibility of stimulus and response as compared with separate input and output units, e.g. input buttons which do  
30 not overlap the display screen. A yet further advantage is that levels can be set more quickly with knobs and roller wheels than with separate up-buttons and down-buttons.

### Brief list of drawings

The invention is explained below in more detail with reference to the attached drawings, in which:

5

Figure 1 depicts schematically a view of a multi-function unit according to a preferred embodiment of the invention, with the incorporated stereo system activated and the stereo system's CD page selected.

10 Figure 2 depicts schematically a view of a multi-function unit according to a preferred embodiment of the invention, with the incorporated stereo system activated and the stereo system's radio page selected.

15 Figure 3 depicts schematically a view of a multi-function unit according to a preferred embodiment of the invention, with the incorporated stereo system activated and the stereo system's sound focus page selected.

20 Figure 4 depicts schematically a view of a multi-function unit according to a preferred embodiment of the invention, with the incorporated stereo system activated and the stereo system's sound reproduction page selected.

Figure 5 depicts schematically a view of a multi-function unit according to a preferred embodiment of the invention, with the incorporated airconditioning system activated.

25 Figure 6 depicts schematically a view of a multi-function unit according to a preferred embodiment of the invention, with the incorporated navigation system activated and the navigation system's main page selected.

30 Figure 7 depicts schematically a view of a multi-function unit according to a preferred embodiment of the invention, with the incorporated navigation system activated and the navigation system's input page selected.

Figure 8 depicts schematically a view of a multi-function unit according to a preferred embodiment of the invention, with the incorporated lighting system activated.

#### Description of preferred embodiments

5

The present invention relates to a multi-function unit 1 incorporating at least one display screen 2 and at least one knob 4,6. The multi-function unit 1 according to the preferred embodiment described below incorporates a display screen 2, two knobs 4,6, a roller wheel 8, four system selector buttons 10,12,14,16 and four function selector  
10 buttons 18,20,22,24. The same reference notations are used throughout for the same features in the various drawings.

The multi-function unit according to the invention affords the advantage of providing a multi-function unit 1 which resembles mechanical airconditioning, lighting panel and  
15 radio installations of traditional design, thereby facilitating user recognition through conformity to usual patterns and hence creating user confidence in the relatively complicated interface. Another advantage is that the multi-function unit 1 is suitable for step-by-step control of functions. A further advantage is that the knob/knobs 4,6  
is/are mechanical and at least partly overlaps/overlap the display screen 2 and that  
20 rotating it/them changes the software-controlled representations 30,32,56,58,84,86,88,90,92,94,96,98 of knob functions on the display screen 2, and provides an approximation between input and feedback, thereby reducing the cognitive load upon the driver through high compatibility of stimulus and response as compared  
with separate input and output units, e.g. input buttons which do not overlap the  
25 display screen. A yet further advantage is that levels can be set more quickly with knobs 4,6 and roller wheel 8 than with separate up-buttons and down-buttons.

Figure 1 depicts schematically a view of a multi-function unit 1 according to a preferred embodiment of the invention, with the incorporated stereo system 36  
30 activated and the stereo system's CD page selected.

The multi-function unit 1 according to the invention incorporates at least one display screen 2. For the sake of simple design, one display screen 2 is preferred, but two or more display screens may also be used. At the top of the display screen 2 there is preferably a list 26 of status symbols 28 which are always visible irrespective of which of the constituent systems of the multi-function unit is activated. The list 26 may for example display information which has by law always to be available, e.g. whether the extra heater for the cab is switched on. This list 26 may also display other functions which the driver may be supposed to desire information about without having to go into the respective systems, e.g. mute for the stereo volume or voice guidance for the navigation system. The colours shown on the display screen 2 are preferably selected so as to provide good contrast without too much brightness, so that information on the display screen 2 is visible in all light conditions without disturbing the driver when driving in the dark. Each system incorporated in the multi-function unit preferably has its own colour scheme so that the driver can know which system is activated even without having to focus his/her gaze directly on the display screen 2. The graphics on the display screen 2 are so designed as to facilitate understanding of the functions of the respective controls, i.e. the knobs 4,6, the roller wheel 8 and the function selector buttons 18,20,22,24. Each system may be provided with its own colour to facilitate recognition of the particular system visible at the time on the display screen 2.

The multi-function unit 1 incorporates at least one, but preferably two, mechanical knobs 4,6 which at least partly overlap the display screen 2, which first and second knobs 4,6 respectively effect, when rotated, a change in the software-controlled representations 30,32 of the respective functions of the first and second knobs on the display screen 2. The knobs 4,6 are connected to different devices depending on the particular system activated at the time and therefore have different meanings in different systems. In addition to their rotary function, the knobs 4,6 may also be provided with a push function or pull function, i.e. at least one mechanical knob 4,6 may be arranged to effect a change in the software-controlled representation 30,32, e.g. graphics, of the knob's function on the display screen 2 when the mechanical knob 4,6 is subjected to a movement which is substantially perpendicular relative to the plane of the rotary movement, and said movement substantially perpendicular relative to the

plane of the rotary movement is substantially towards and away respectively from the display screen 2. The movements of the knobs 4,6 preferably take place in discrete steps. To facilitate manoeuvring of the knobs 4,6, their diameters are large enough to make them easy to grip, e.g. about 40 mm. The knobs 4,6 preferably overlap the display screen 2 by about 40% of the diameter of the respective knobs 4,6, but the overlap may also be greater or smaller. The essential point is that the knobs 4,6 overlap the display screen 2, thereby providing a mental model of the fact that the system represented on the display screen 2 is mechanical. The graphics which show what happens when the knobs 4,6 are rotated are designed to make it easy for users to understand what happens when the knobs 4,6 are rotated, i.e. how the knobs 4,6 function. When for example the stereo volume is altered, this is represented by an arcuate scale 30 just above the knob 4. Integrating the knobs 4,6, the display screen 2 and the software-controlled representations 30,32 results in a device according to the invention. The graphics on the display screen 2 are preferably adjacent to the respective knobs 4,6, roller wheel 8 and means 18,20,22,24.

The multi-function unit 1 may further incorporate at least one roller wheel 8, rotation of which results in a change in a software-controlled representation 34 of the function of the roller wheel 8 on the display screen 2. Movements of the roller wheel 8 preferably take place in discrete steps. The roller wheel 8 may also be provided with a push function, i.e. at least one roller wheel 8 may be arranged to effect a change in a software-controlled representation 34 of the roller wheel's function on the display screen 2 when the roller wheel 8 is subjected to a movement which takes place substantially in the plane of rotation of the roller wheel 8, preferably towards the display screen 2, and in addition, at least one roller wheel 8 may also, but need not necessarily, overlap at least partly the display screen 2.

The multi-function unit 1 according to the invention has at least one system selector button 10,12,14,16 by which to choose between the constituent systems of the multi-function unit 1. If the multi-function unit 1 according to the invention incorporates, for example, four systems 36,38,40,42, there may be, in all, between one and four system selector buttons 10,12,14,16. If there is one system selector button 10, the latter may

be arranged for leafing between the constituent systems 36,38,40,42 by their being activated in turn by pressing the system selector button 10. Preferably there are the same number of selector buttons 10,12,14,16 as constituent systems 36,38,40,42, in this case four system selector buttons 10,12,14,16 when the multi-function unit 1  
5 incorporates systems for stereo 36, airconditioning 38, navigation 40 and lighting 42, whereby each of the system selector buttons 10,12,14,16 activates the respective system 36,38,40,42 associated with the respective system selector button 10,12,14,16 in order to provide rapid and direct access to whichever of the systems 36,38,40,42 is desired without having first to leaf past a number of other systems or reduce the menu  
10 depth. The result is a basic menu structure which provides rapid access to all functions for devices which need setting during driving. All the functions are preferably represented on one page in the respective systems to enable rapid setting and hence shorten the time when the driver is not devoting his/her full attention to the road and surrounding traffic. The system selector buttons 10,12,14,16 may be situated  
15 anywhere on the multi-function unit 1, although preferably above the screen display 2 but below the top edge of the multi-function unit 1 to make it possible to rest a hand on the top edge of the multi-function unit 1 or on the top edge of, for example, an instrument panel if the multi-function unit 1 is integrated in the latter, when selecting systems 36,38,40,42 on a road of such a kind that the moving vehicle is subject to  
20 violent movements, without the display screen 2 being concealed too much by the driver's hand, so that the driver receives quick acknowledgement that the right system 36,38,40,42 has been selected by pressing the system selector button 10,12,14,16, through the activated system 36,38,40,42 being represented on the display screen 2. The system selector button 10 and the system selector buttons 10,12,14,16 respectively  
25 can be used to change respectively as described below the function of the at least one knob 4,6 mentioned above, the function of the at least one roller wheel 8 mentioned above and the function of the at least one means 18,20,22,24 mentioned below.

The multi-function unit 1 may further incorporate at least one means 18,20,22,24 for  
30 switching on and off a device which is represented on the display screen 2. If the means is a button, it may be called a function selector button. The function selector buttons 18,20,22,24 are programmable and are connected to different devices

depending on the particular system 36,38,40,42 activated at the time and therefore have different meanings in different systems 36,38,40,42. The function selector button 18,20,22,24 may activate/deactivate the device every second time the button is pressed. The function selector buttons 18,20,22,24 may be situated anywhere on the multi-function unit 1, although preferably in a row from top to bottom along one side of the display screen 2 and preferably on the side of the display screen 2 opposite to the steering wheel so that the display screen 2 will not be concealed by the driver's hand when the driver presses a function selector button 18,20,22,24 and the driver will have rapid acknowledgement that the right device has been activated or deactivated through the representation on the display screen 2 of the respective activated or deactivated device, preferably directly adjacent to the respective function selector button 18,20,22,24, by the symbol on the screen 2 being illuminated when the device is activated and extinguished when the device is deactivated.

The multi-function unit 1 is described in more detail below by way of examples. The systems described are stereo 36, airconditioning 38, navigation system 40 and lighting system 42.

As previously mentioned, Figure 1 depicts schematically a view of a multi-function unit according to a preferred embodiment of the invention, with its incorporated stereo system 36 activated and the stereo system's CD page selected. In this embodiment the stereo system 36 incorporates four pages. The function selector buttons 18,20,22,24, which in this embodiment are four in number, are programmed so that the respective page can be reached when the respective function selector button 18,20,22,24 is pressed at a time when the stereo system 36 is activated. Pressing a function selector button 18,20,22,24 thus deactivates the page which was displayed before the function selector button 18,20,22,24 was pressed. The left knob 4 is used on all of the constituent pages of the stereo system 36 to adjust the volume of the stereo system. The roller wheel 8 is used on the CD page to select pieces of music from a list 44 of pieces of music. Selection involves a marker 46 being moved up and down the list 44 by turning the roller wheel 8, followed by pressing the roller wheel 8 in to select the specific piece of music 48.

There is also a page (not depicted) called the settings page on which it is possible to set preferences regarding such factors as sound level, channel choice and playback mode.

Figure 2 depicts schematically a view of a multi-function unit 1 according to a preferred embodiment of the invention, with its incorporated stereo system 36 activated and the stereo system's radio page selected. The roller wheel 8 is used on the radio page to select radio channels from a list 50 of radio channels. Selection involves a marker 52 being moved up and down the list 50 by turning the roller wheel 8, followed by pressing the roller wheel 8 in to select the specific radio channel 54.

10

Figure 3 depicts schematically a multi-function unit 1 according to a preferred embodiment of the invention, with its incorporated stereo system 36 activated and the stereo system's sound focus page selected. The roller wheel 8 adjusts forward/rear balance in the interior or the driver's cab. The right knob 6 is used for adjusting the left/right balance. These two controls 8,6 move a marker 56 representing sound focus on the display screen 2.

15

Figure 4 depicts schematically a view of a multi-function unit 1 according to a preferred embodiment of the invention, with its incorporated stereo system 36 activated and the stereo system's sound reproduction page selected. The right knob 6 is used for selecting the frequency band 58, which has to be adjusted with respect to the level 60, and the roller wheel 8 is used for adjusting the level 60.

20

Figure 5 depicts schematically a view of a multi-function unit 1 according to a preferred embodiment of the invention, with its incorporated airconditioning system 38 activated. The airconditioning system 38 is so designed as to mimic a traditional mechanical airconditioning system. The left knob 4 is used for adjusting the fan power, which is preset in automatic position if the knob 4 is pushed in. The roller wheel 8 controls the air distribution in that turning the roller wheel 8 moves the marker 62 on the display screen between the various positions 64,66,68,70 for air delivery, and pressing the roller wheel 8 down activates or deactivates the selected air delivery depending on whether it was previously deactivated or activated respectively. The

25

30

right knob 6 adjusts the temperature in the same way as the fan power. In this system the function buttons 18,20,22,24 are programmed to control the airconditioning in terms of off/on, extra heat off/on, recirculation off/on and economy position off/on respectively.

5

Figure 6 depicts schematically a view of a multi-function unit 1 according to a preferred embodiment of the invention, with its incorporated navigation system 40 activated and the navigation system's main page selected. In this embodiment the navigation system 40 comprises three pages. The function selector buttons

10 18,20,22,24, which in this embodiment are four in number, are programmed in such a way that, when the navigation system is activated, pressing the respective function selector buttons enables the main page and the map page respectively to be reached via two of the buttons, and the voice guidance to be switched on/off or the traffic information reading respectively to be switched on/off respectively via two of the

15 buttons. Pressing a function selector button which is connected to one of the two pages thus deactivates the page which was displayed before the function selector button was pressed. All of the function selector buttons 18,20,22,24 are continuously displayed on the respective page, even on the input page, when the navigation system

20 40 is activated. The main page provides a schematic and overall picture of how the relevant route is fed in. The left knob 4 controls a marker 72 which runs left/right across the truck symbol 74 and the road symbol 76. The marker's position on the display screen 2 determines various alternatives in a list 78 in which it is possible to move up/down by means of the roller wheel 8. Turning the roller wheel 8 moves a

25 marker 80 in the list, after which the item marked is selected by pressing the roller wheel 8. If a destination symbol 82 is marked, a list with the alternatives "change destination" and "delete destination" appears. If a road symbol 76 is marked, the alternative "insert destination" appears. If the truck symbol 74 is marked, the alternative "settings" appears. As soon as the roller wheel 8 is pressed in, the navigation system jumps to the input page. There is also a map page (not depicted)

30 which makes it possible to bring up electronic maps which show the vehicle's position through the vehicle being provided with a position determining device such as a GPS receiver. On the map page, the left knob 4 is used for moving the map left/right and

the roller wheel 8 for moving the map up/down. The right knob 6 is used for enlarging and reducing the size of the map image.

Figure 7 depicts schematically a view of a multi-function unit 1 according to a preferred embodiment of the invention, with its incorporated navigation system 40 activated and the navigation system's input page selected. The left knob 4 controls a list 84 of letters which are marked by moving a marker 86 in the list 84 by turning the knob 4 and selecting a marked letter by pressing the knob 4 in. Marking and selecting a number of letters in this way one after another can be used to write words or parts of words on the display screen 2. Words which are no longer selectable according to a database of places, countries, addresses and other designations which appear on maps, such as major road intersections, are not selectable on the list connected to the left knob 4, thereby enabling input to be done more quickly.

Figure 8 depicts schematically a view of a multi-function unit 1 according to a preferred embodiment of the invention, with its incorporated lighting system 42 activated. The left knob 4 controls lamps off/on, parking lamps and interior lighting. The right knob 6 controls any lamps which have to be switched on in that turning the knob moves the marker 88 on the display screen 2 between the various positions 90,92,94,96,98 for the respective lamps, and when the knob 6 is pressed down the lamp selected is switched on or off depending on whether it was previously off or on respectively. In this system the function buttons 18,20,22,24 are programmed to control sound signals which in many countries may not be activated at night in built-up areas, e.g. "vehicle reversing" warning sounds off/on or extra-loud horn on/off.

25

In the preferred embodiment of the invention, at least one of the aforesaid at least one knob 4,6 and the aforesaid at least one roller wheel 8 respectively may be provided with tactile feedback by the knob 4,6 and the roller wheel 8 respectively being arranged stepwise with resistance between steps. The design of the push functions in the buttons 10,12,14,16,18,20,22,24, the roller wheel 8 and the knobs 4,6 may also be arranged to provide good tactile feedback to confirm to the driver that button pressing

30

has been successful. This tactile feedback may be reinforced by acoustic feedback in the form of audible clicks.

The various controls are preferably arranged to be distinguishable in the dark by means  
5 of diode lamps. Voice control of the multi-function unit is also possible.

It is possible to arrange more, fewer and/or other systems, e.g. "vehicle reversing"  
camera, trip data, safety and logistic systems, in the multi-function unit than those here  
described.

10

Instead of a roller wheel it is also possible to use buttons, e.g. an up-button, a down-  
button and a selector button, which buttons replace the roller wheel's functionality.

15

## Claims

1. A multi-function unit for vehicle, which multi-function unit (1) incorporates a display screen (2), **characterised** in that the multi-function unit (1) further  
5 incorporates at least one mechanical knob (4,6) which at least partly overlaps the display screen (2) and which when rotated causes a change in the software-controlled representation (30,32,56,58,84,86,88,90,92,94,96,98) of the function of the knob (4,6) on the display screen (2).
- 10 2. A multi-function unit according to claim 1, **characterised** in that the multi-function unit (1) incorporates two mechanical knobs (4,6) which at least partly overlap the display screen (2) and comprise first and second knobs respectively (4,6) which when rotated cause a change in the software-controlled  
15 representation (30,32,56,58,84,86,88,90,92,94,96,98) of the respective functions of the first and second knobs (4,6) on the display screen (2).
3. A multi-function unit according to claim 1 or 2, **characterised** in that at least one mechanical knob (4,6) is arranged to cause a change in a software-controlled representation (30,32,56,58,84,86,88,90,92,94,96,98) of the  
20 functions of the knob (4,6) on the display screen (2) when the mechanical knob (4,6) is subjected to a movement which is substantially perpendicular to the plane of the rotary movement.
4. A multi-function unit according to claim 3, **characterised** in that the  
25 movement substantially perpendicular to the plane of the rotary movement is substantially towards the display screen (2).
5. A multi-function unit according to claim 3, **characterised** in that the  
30 movement substantially perpendicular to the plane of the rotary movement is substantially away from the display screen (2).

6. A multi-function unit according to any one of claims 1 to 5, **characterised** in that the multi-function unit (1) further incorporates at least one roller wheel (8) which when subjected to rotation causes a change in the software-controlled representation (34,44,46,48,50,52,54,56,60,62,64,66,68,70,78,80) of the function of the roller wheel (8) on the display screen (2).  
5
7. A multi-function unit according to claim 6, **characterised** in that at least one roller wheel (8) at least partly overlaps the display screen (2).
- 10 8. A multi-function unit according to claim 6 or 7, **characterised** in that at least one roller wheel (8) is arranged to cause a change in a software-controlled representation (34,44,46,48,50,52,54,56,60,62,64,66,68,70,78,80) of the function of the roller wheel (8) on the display screen (2) when the roller wheel (8) is subjected to a movement which is substantially in the rotation plane of the roller wheel (8).  
15
9. A multi-function unit according to claim 8, **characterised** in that the movement substantially in the rotation plane of the roller wheel (8) is substantially towards the display screen (2).  
20
10. A multi-function unit according to any one of claims 1 to 9, **characterised** in that the multi-function unit (1) further incorporates at least one means (18,20,22,24) for switching on and off a device which is represented on the display screen (2).  
25
11. A multi-function unit according to any one of claims 1 to 10, **characterised** in that the multi-function unit (1) further incorporates at least one system selector button (10,12,14,16) by which the function of the aforesaid at least one knob (4,6), the function of the aforesaid at least one roller wheel (8) and the function of the aforesaid at least one means (18,20,22,24) can be changed.  
30

12. A multi-function unit according to any one of claims 1 to 11, **characterised** in that at least one out of the aforesaid at least one knob (4,6) and the aforesaid at least one roller wheel (8) respectively is provided with tactile feedback by the knob (4,6) and/or roller wheel (8) being arranged stepwise with resistance  
5 between steps.
13. A vehicle **characterised** by incorporating a multi-function unit (1) according to any one of claims 1 to 12.

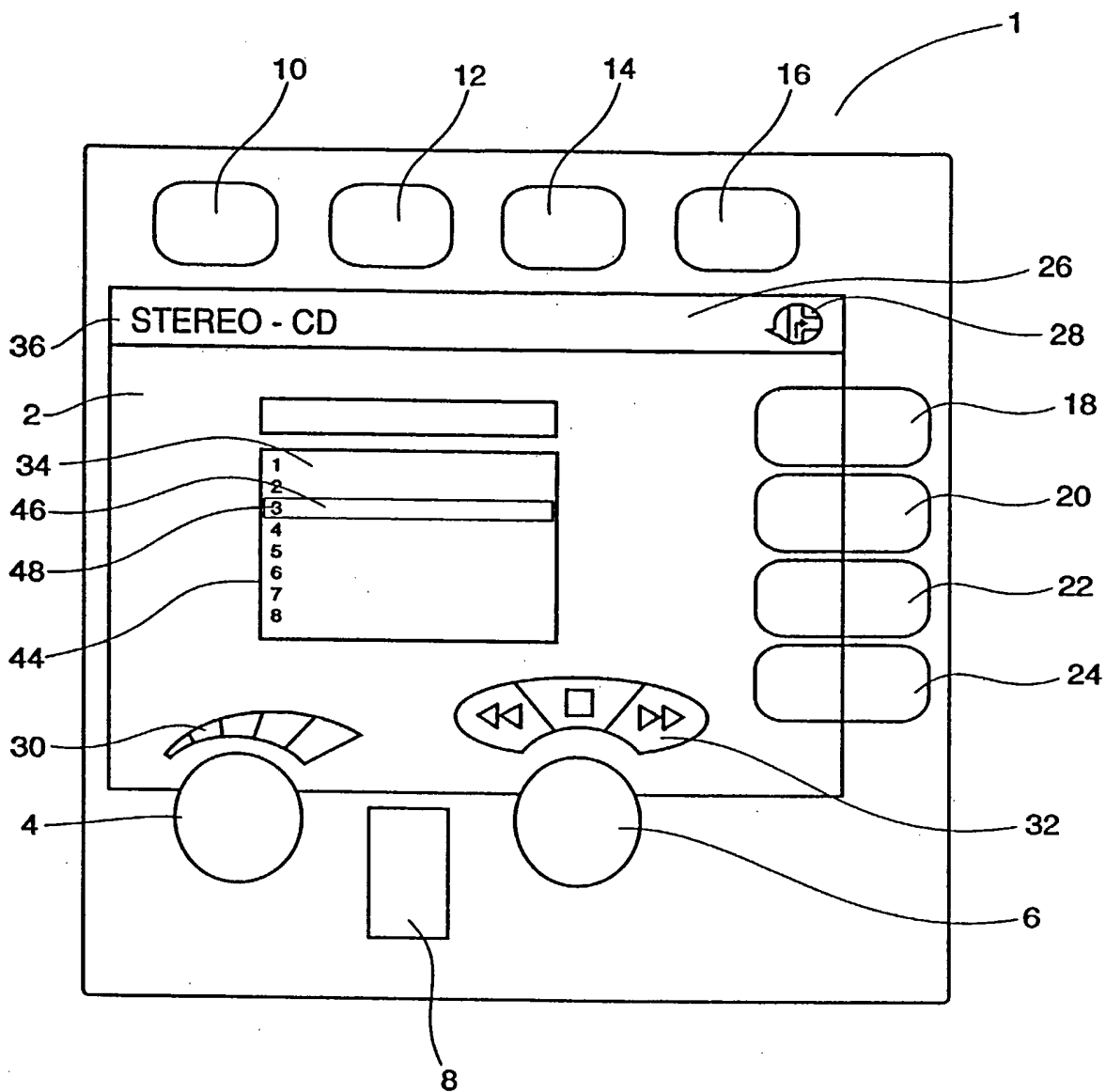


Fig. 1.

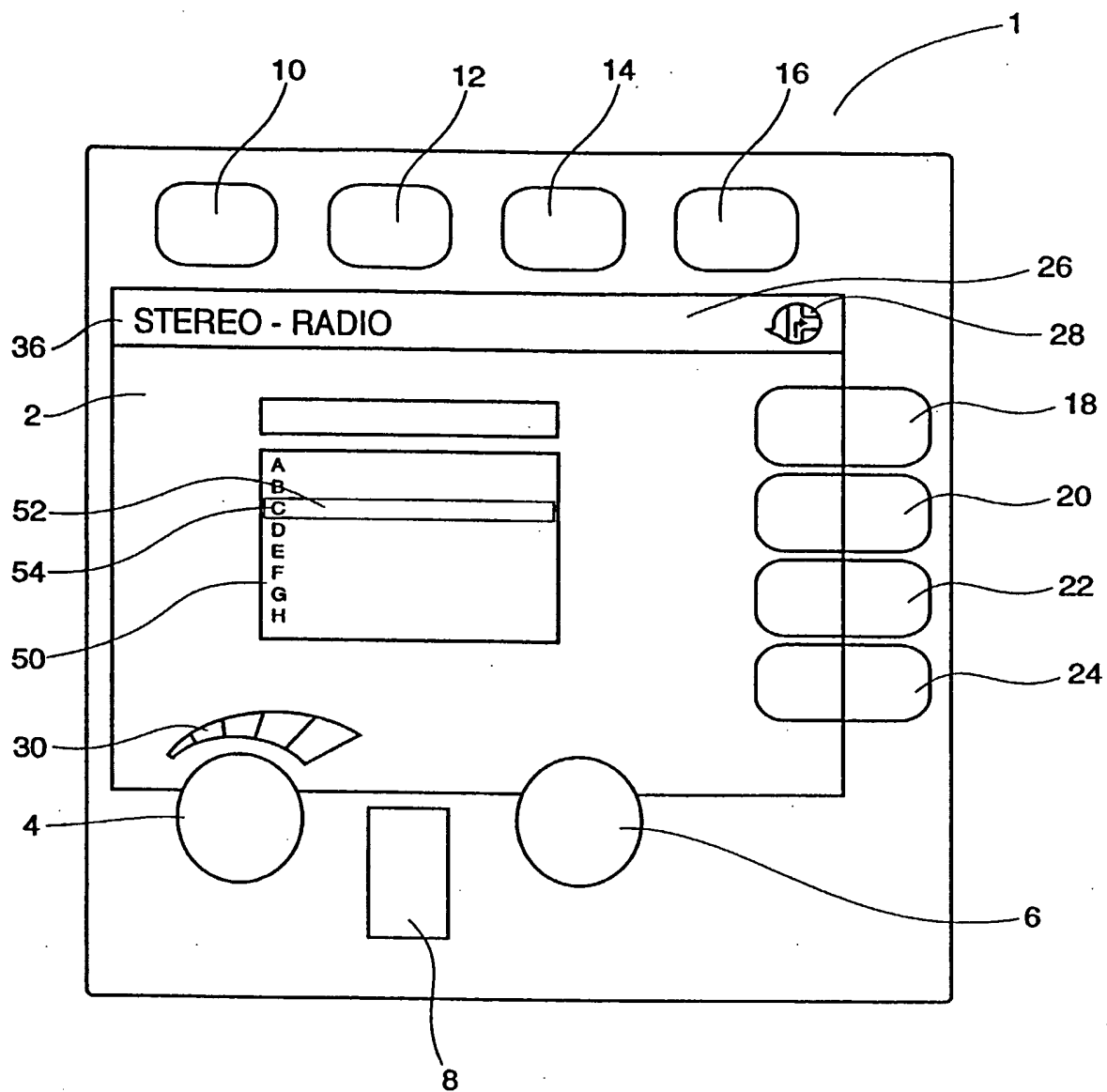


Fig 2.

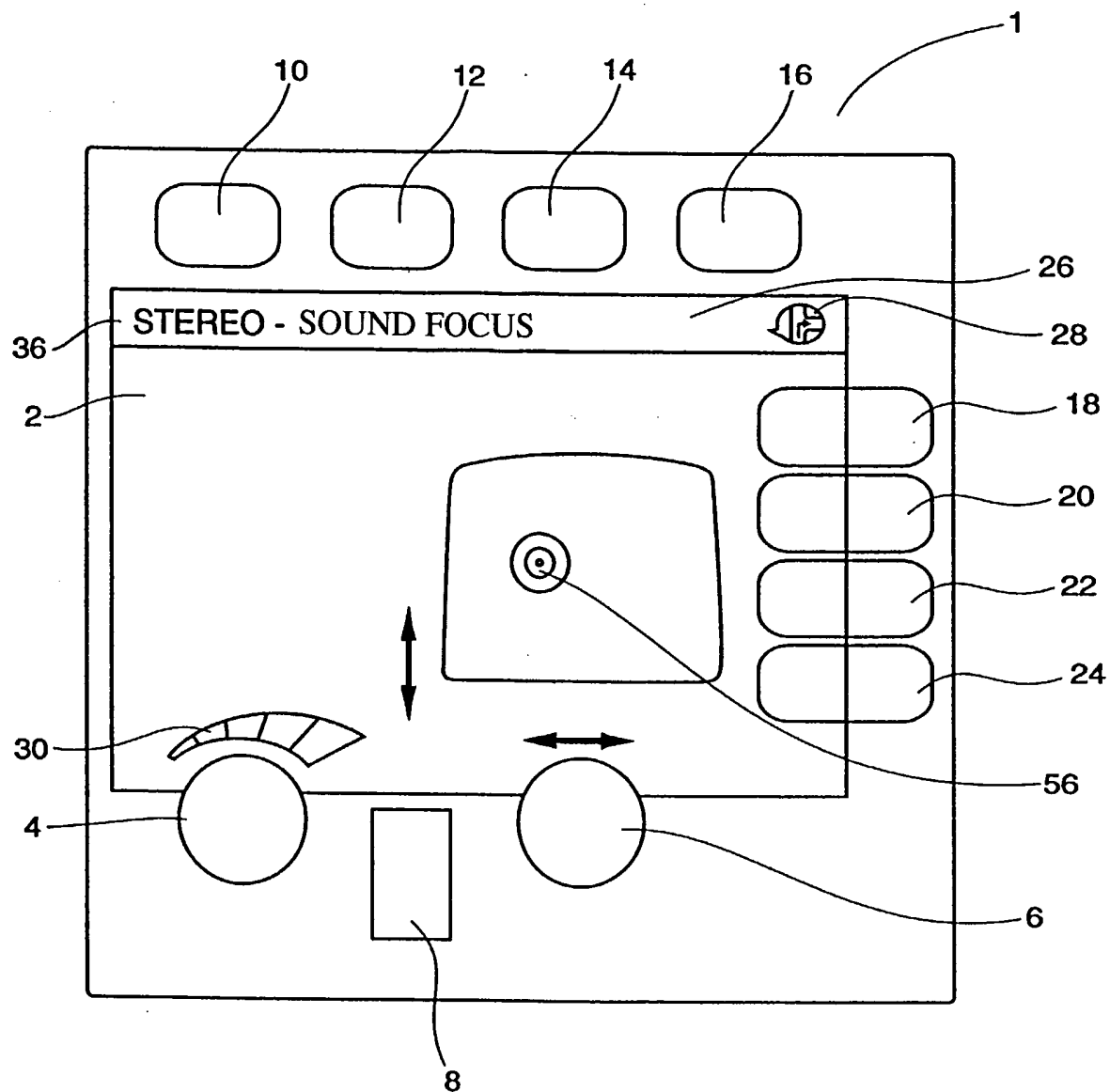


Fig 3.

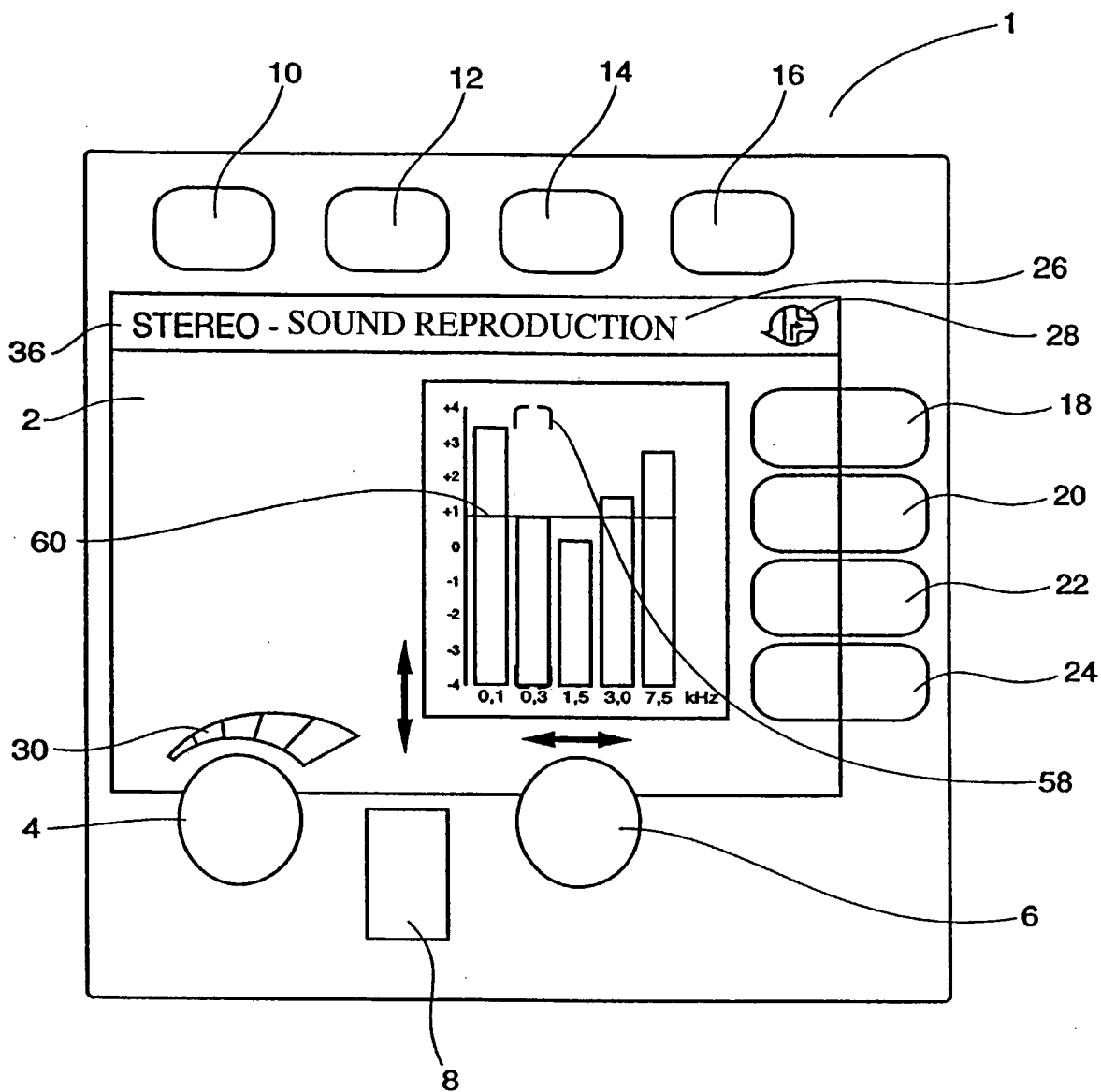


Fig 4.

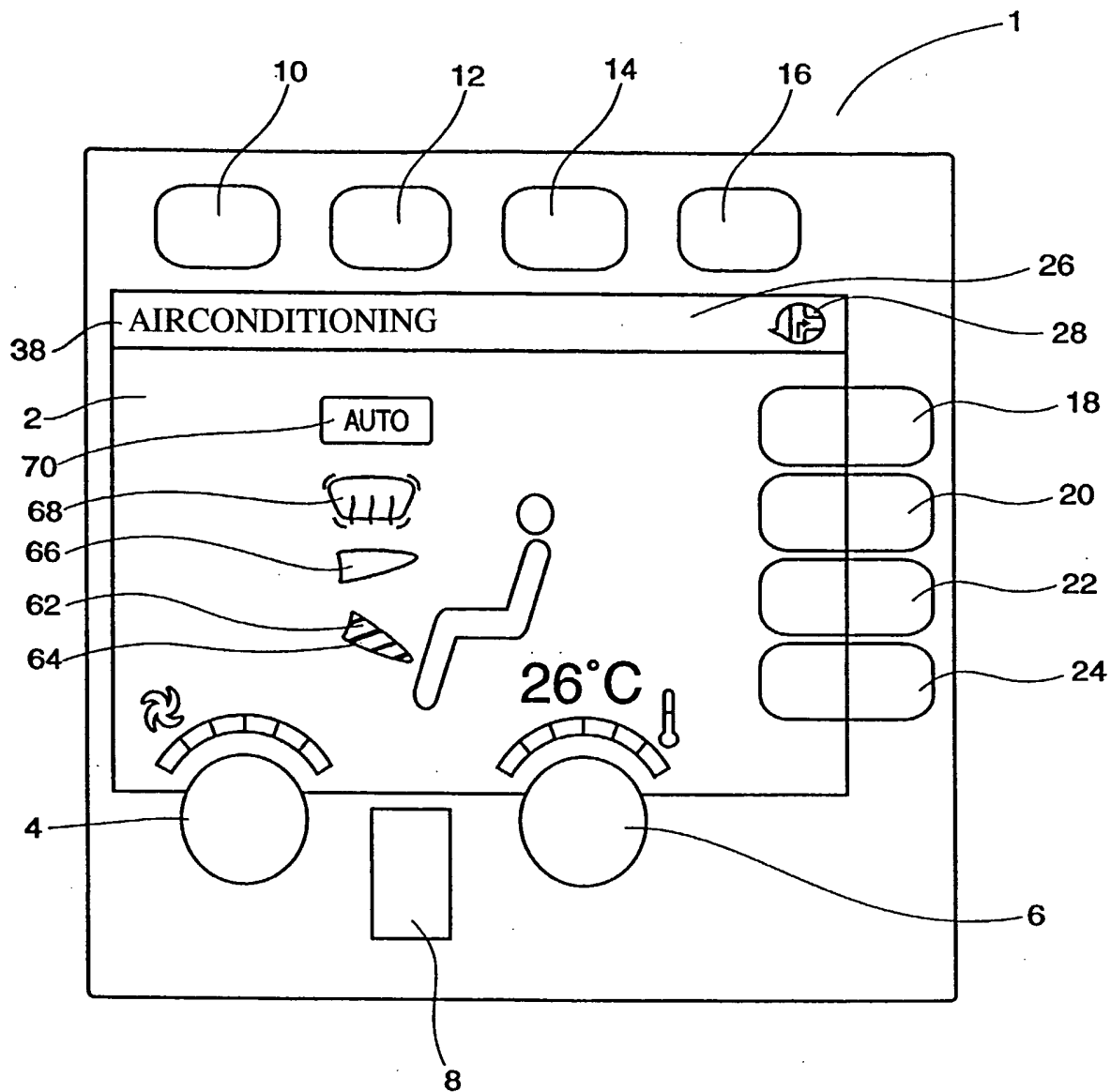


Fig 5.

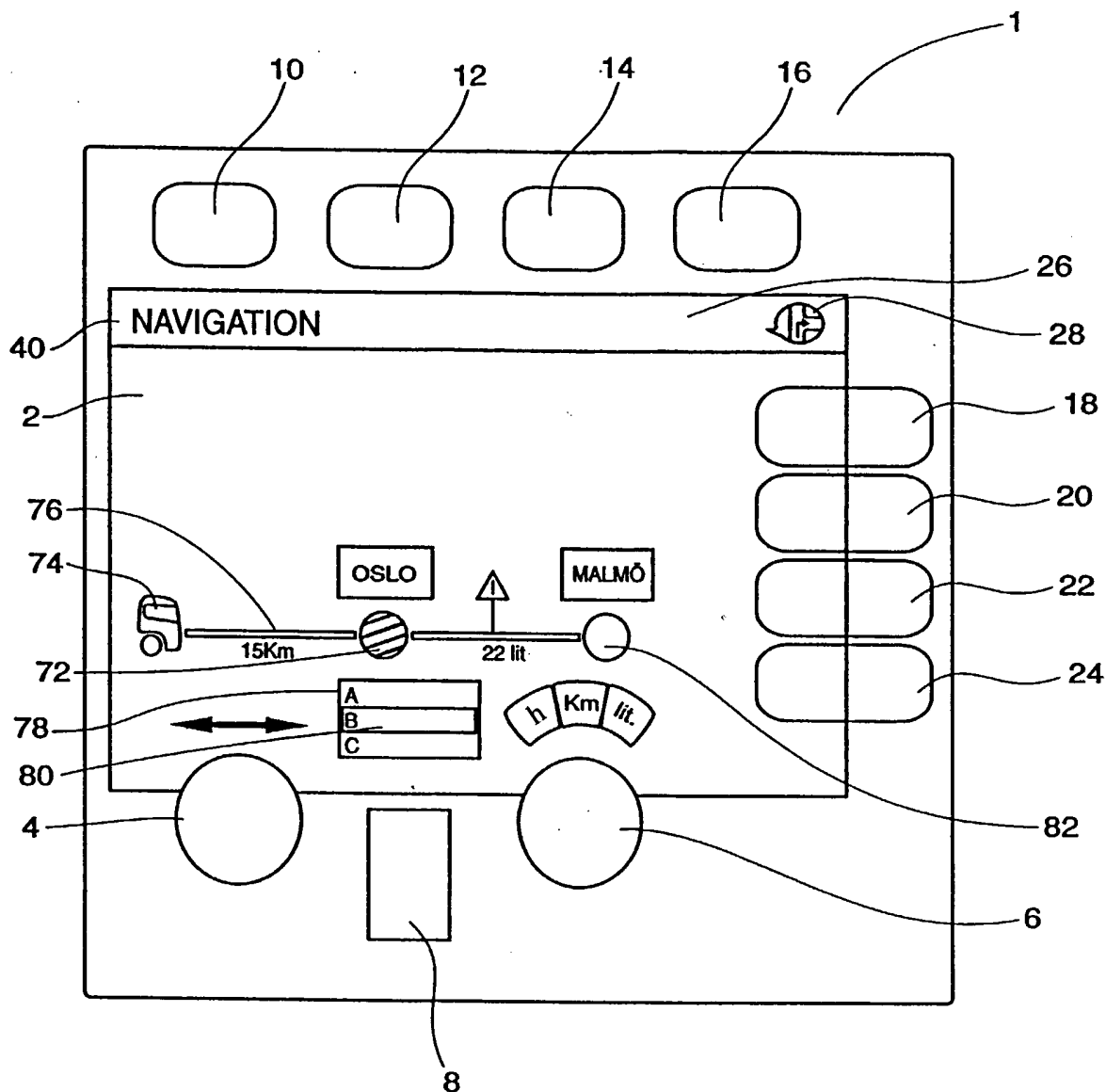


Fig 6.

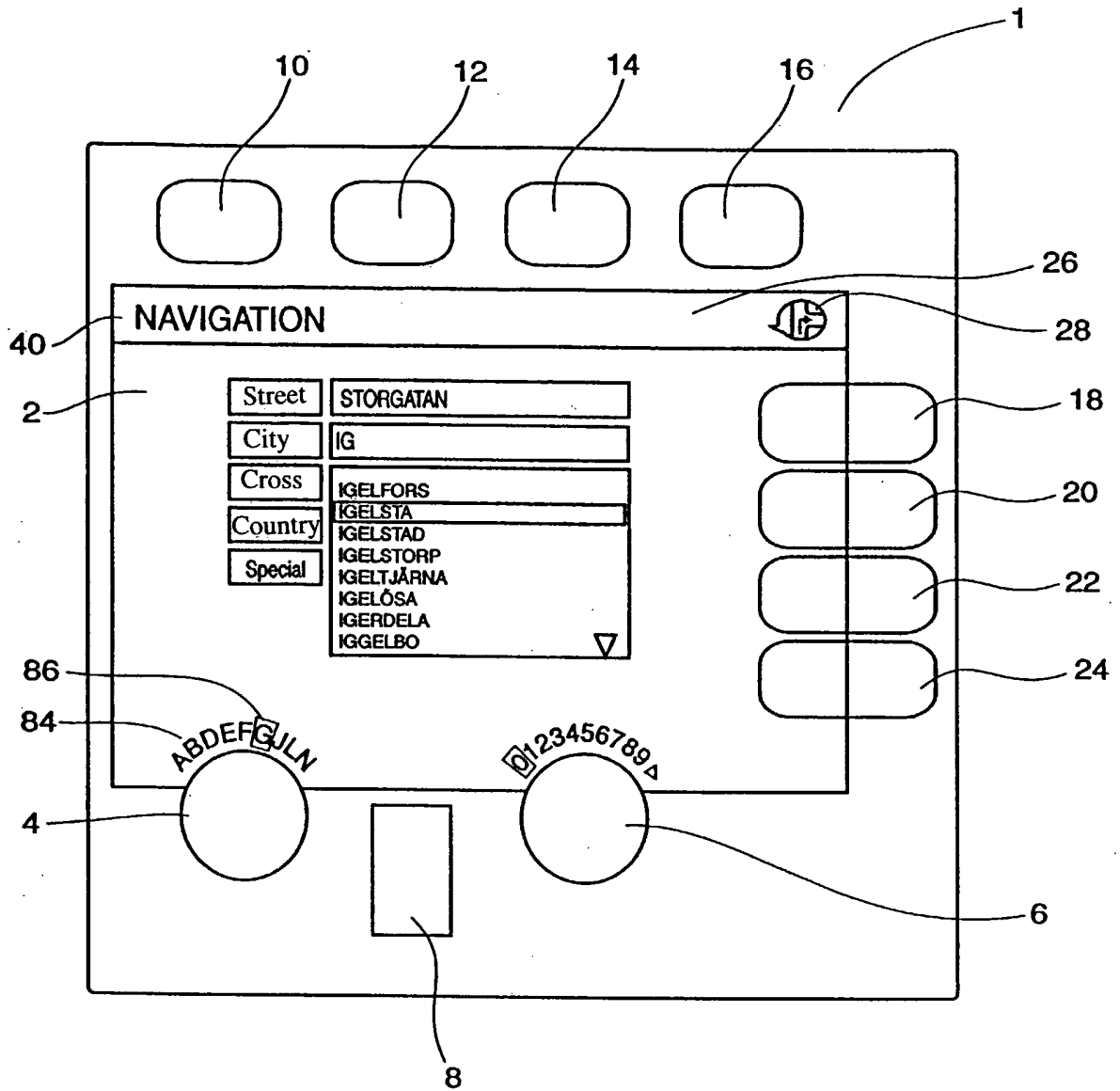


Fig 7.

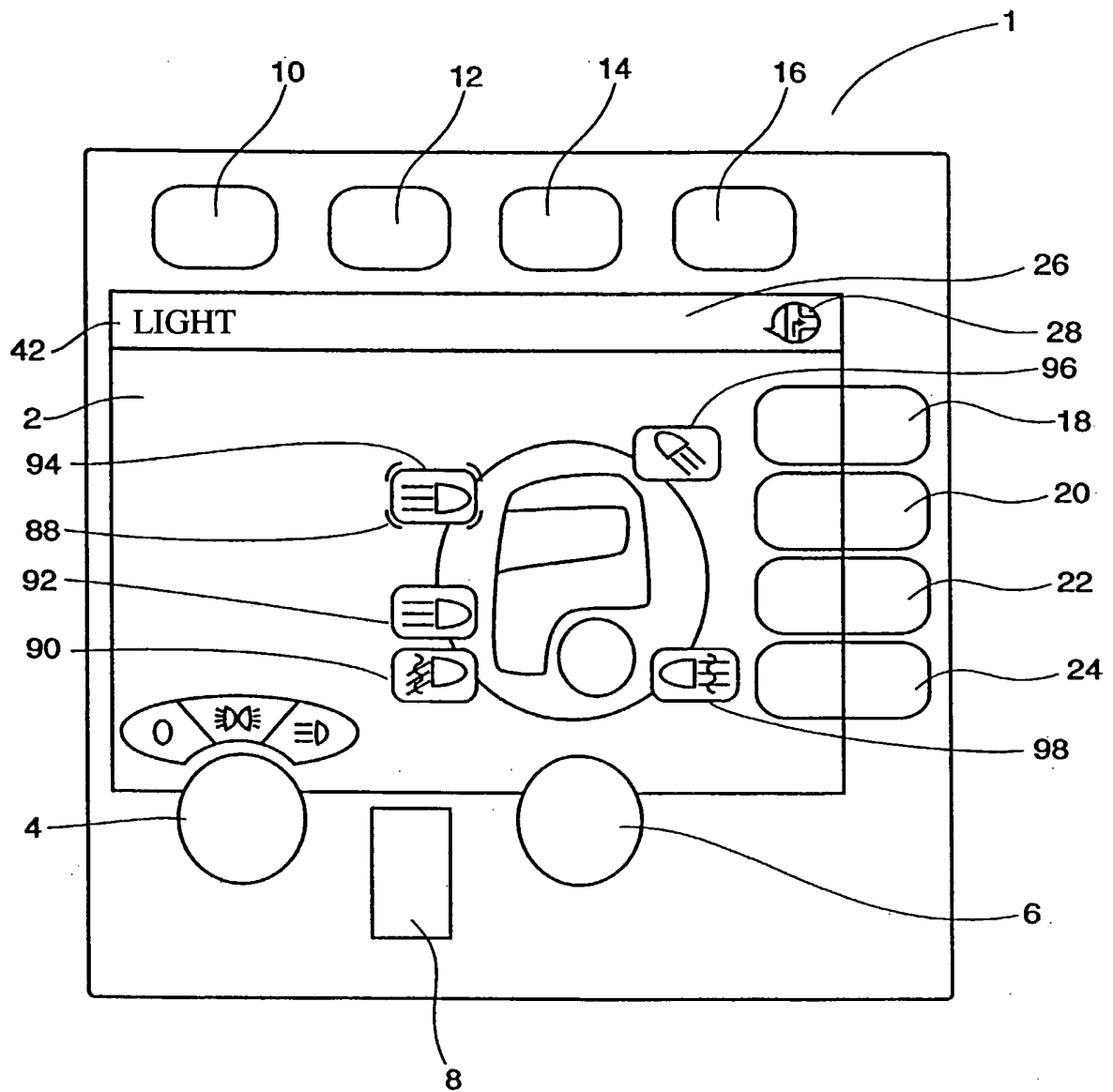


Fig 8.