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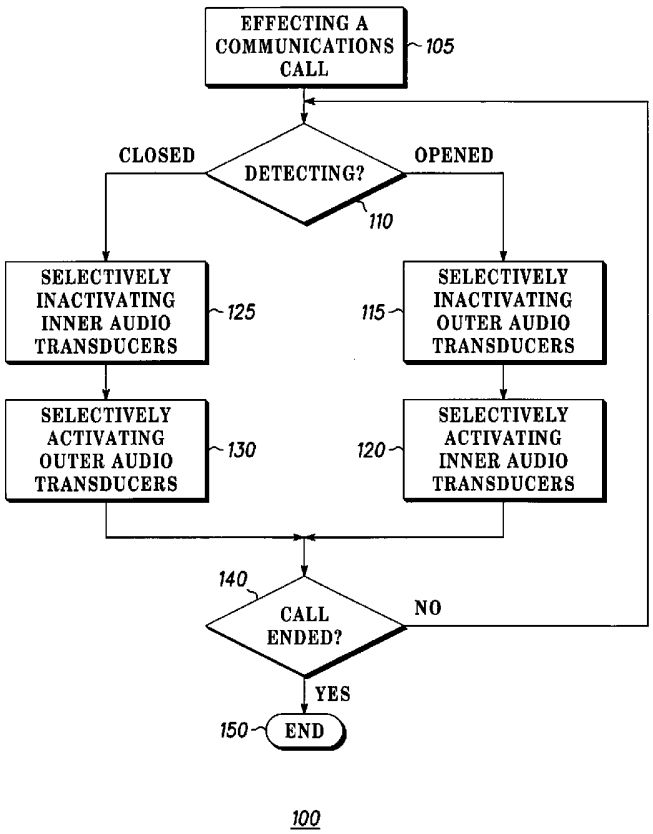


(57) Abstract: A closeable radio communications device (1) and method (100). The Method (100) provides for selective operation of outer audio transducers (5e,5d) and inner audio transducers (6e,6d) of the device (1) that has housing (21) with at two portions (22,23) movably mounted to each other to allow relative movement of the portions (22,23) between a closed position and an opened position. In use the method (100) includes effecting a communications call (105) through a transceiver (8) of the device (1), thereafter there is a detecting movement step (110) of the two portions (22,23) between the closed position and the opened position. Next, a selectively inactivating operation (115) of at least one of the outer transducers (5e,5d) results when the detecting determines the movement of the two portions (22,23) between the closed position to the opened position. Alternatively, there is a selectively inactivating operation (125) of at least one of the inner transducers (6e,6d) results when the detecting determines the movement of the two portions (22,23) between the opened position to the closed position.

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# CLOSEABLE RADIO COMMUNICATIONS DEVICE AND METHOD THEREREOF

## FIELD OF THE INVENTION

This invention relates a closeable communications device with a two part housing movable from a closed to an opened position. The invention is particularly useful for, but not necessarily limited to, selective activation and deactivation of outer and inner audio transducers of closeable communications devices depending of whether or not the device's housing is in the closed or opened position.

## BACKGROUND OF THE INVENTION

Communication devices, such as radio or cellular telephones, that are easy to transport and support desirable features are becoming commonplace. One communication device that is easy to transport is a closeable cellular telephone having a two part housing movable from an opened position to a closed position and vice versa. In the opened position, a conventional cellular telephone user interface includes a speaker, a microphone, a display, and a keypad, that are fully exposed. Also, the cellular telephone has a length that is sufficient to allow the ear and mouth of the user to align with the speaker and microphone, respectively.

In the closed position the cellular telephone is shorter in length. Also, when most closable cellular telephones are in the closed position either the speaker or microphone or both the speaker and microphone are audibly inaccessible and inoperable. Hence, when a user wishes to make a typical call, they first adjust the telephone to the opened position so that

the required speaker and microphone (audio transducers) are both audibly accessible and operable. This may be inconvenient and thus closeable telephones have been proposed that have a microphone and speaker operable when in the closed position and they do not necessarily require the telephone housing to be opened when dialling a number and making a call. However, it would be useful to have a closeable telephone that can maintain a communications call whilst a user moves or flips the housing between the opened and closed position, or vice versa, and selectively activate and inactivate the audio transducers.

In this specification, including the claims, the terms 'comprises', 'comprising' or similar terms are intended to mean a non-exclusive inclusion, such that a method or apparatus that comprises a list of elements does not include those elements solely, but may well include other elements not listed. Also, the terms inactivating and inoperable have the same meaning and can be used interchangeably throughout this specification. Similarly, the terms activating and operable have the same meaning and can be used interchangeably throughout this specification

## SUMMARY OF THE INVENTION

According to one aspect of the invention there is provided a closeable radio communications device comprising:

a housing having at least two portions movably mounted to each other to allow relative movement of the portions between a closed position and an opened position;

a user interface;

a transceiver disposed in the housing;

at least two outer audio transducers audibly accessible when the housing is in the closed position, the outer audio transducers comprising an outer speaker and an outer microphone;

at least one inner audio transducer audibly accessible when the housing is in the opened position and audibly inaccessible when the housing is in the closed position; and

a processor disposed in the housing and coupled to the user interface, wherein in use, when the housing is in the closed position communication through the transceiver is effected by actuation of the user interface, and wherein during the communication the outer audio transducers are operable when the housing is in the closed position and when the housing is moved to the opened position at least one of the outer audio transducers becomes inoperable whilst the communication is maintained.

Suitably, the at least one outer audio transducer includes an outer speaker and outer microphone that are audibly accessible when the housing is in the closed position. Preferably, the outer speaker and outer microphone are operable when the housing is in the closed position.

Suitably, the at least one inner audio transducer includes an inner speaker that is audibly inaccessible when the housing is in the closed position. Preferably, the inner speaker is inoperable when the housing is in the closed position. The inner speaker may suitably be audibly accessible and operable when the housing is in the opened position and the outer speaker becomes inoperable when the housing is moved to the opened position.

Suitably, the at least one inner audio transducer includes an inner microphone that is audibly inaccessible when the housing is in the closed position. Preferably, the inner microphone is inoperable when the housing is in the closed position. The inner microphone may suitably be audibly accessible and operable when the housing is in the opened position and the outer microphone becomes inoperable when the housing is moved to the opened position.

Preferably, the inner microphone is mounted in one of the two portions and the inner speaker is mounted in the other one of the two portions. Preferably, the outer microphone is mounted in one of the two portions and the outer speaker is mounted in the other one of the two portions. In an alternative embodimet the outer microphone and the outer speaker may be mounted on the said one of the two portions.

Preferably, the closeable radio communications device includes a housing position detector coupled to the processor to thereby control operability of the outer audio transducers.

Suitably, the two portions are pivotally mounted to each other.

Preferably, the user interface includes a display screen.

Suitably, the user interface includes a keypad.

Preferably, the display screen is a touch screen.

Suitably, the user interface is accessible by a user when the housing is in the closed position.

Preferably, the user interface is an outer user interface and there is an inner user interface that is at least partially hidden when the housing is in the closed position.

According to another aspect of the invention there is provided a method for selective operation of audio transducers of a closeable radio communications device having housing with at least two portions movably mounted to each other to allow relative movement of the portions between a closed position and an opened position, the method including:

effecting a communications call through a transceiver of the device;

detecting movement of the two portions between the closed position and the opened position;

selectively inactivating operation of at least one of the transducers when the detecting determines the movement of the two portions between the closed position and the opened position.

Suitably, the selectively inactivating provides for inactivating an outer speaker. The selectively inactivating may provide for inactivating an inner speaker. Preferably, the outer speaker is audibly accessible when the housing is in the closed position.

Preferably, there is a further step of selectively activating operation of at least one of the transducers when the detecting determines the movement of the two portions between the closed position to the opened position.

Suitably, the selectively inactivating provides for activating an inner speaker. The inner speaker is suitably audibly inaccessible and inoperable when the housing is in the closed position.

## BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be readily understood and put into practical effect, reference will now be made to preferred embodiments as illustrated with reference to the accompanying drawings in which:

Fig. 1 is a block diagram illustrating circuitry of a closeable radio communications device in accordance with the invention;

Fig. 2 illustrates a first embodiment based on the closeable radio communications device of Fig. 1 when in a closed position;

Fig. 3 illustrates the first embodiment based on the closeable radio communications device of Fig. 1 when in an opened position;

Fig. 4 illustrates a second embodiment based on the closeable radio communications device of Fig. 1 when in a closed position;

Fig. 5 illustrates the second embodiment based on the closeable radio communications device of Fig. 1 when in an opened position;

Fig. 6 illustrates a third embodiment based on the closeable radio communications device of Fig. 1 when in a closed position;

Fig. 7 illustrates the third embodiment based on the closeable radio communications device of Fig. 1 when in an opened position;

Fig. 8 illustrates a fourth embodiment based on the closeable radio communications device of Fig. 1 when in a closed position;

Fig. 9 illustrates the fourth embodiment based on the closeable radio communications device of Fig. 1 when in an opened position; and

Fig 10. is a flow diagram illustrating the selective operation of audio transducers of the closeable radio communications device of Fig. 1 when in use.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

In the drawings, like numerals on different Figs are used to indicate like elements throughout. With reference to Fig. 1, there is illustrated a closeable radio communications device 1 comprising a radio frequency communications unit 2 coupled to be in communication with a processor 3. The device 1 also has an outer user interface 5a with a screen 5c and a keypad 5b and an inner user interface 6a with a screen 6c and a keypad 6b. The respective screens 5c, 6c and keypads 5b, 6b of interfaces 5a, 6a are coupled to be in communication with the processor 3. Also, as will be apparent to a person skilled in the art screens 5c, 6c may be touch screens thereby making the keypads 5b, 6b optional. A housing position detector 19 is also coupled to the processor 3 to provide one or more housing position signals (PS), the position detector 19 typically being a mechanically actuated push button switch,

however, the position detector 19 can comprise any suitable detector such as a magnetic sensor (reed switch), a capacitance sensor, an inductance sensors, a potentiometer or a photo sensor.

The processor 3 includes an encoder/decoder 11 with an associated Read Only Memory (ROM) 12 storing data for encoding and decoding voice or other signals that may be transmitted or received by the device 1. The processor 3 also includes a micro-processor 13 coupled, by a common data and address bus 17, to the encoder/decoder 11, a character Read Only Memory (ROM) 14, a Random Access Memory (RAM) 4, static programmable memory 16 and a SIM module 18 for operatively coupling to a removable Subscriber Identity Module (SIM) card. The static programmable memory 16 and SIM module 18 when coupled to a SIM card each can store, amongst other things, selected incoming text messages and a Telephone Number Database TND (phonebook) comprising a number field for telephone numbers and name field for identifiers associated with one the numbers in the name field. For instance, one entry in the Telephone Number Database TND may be 91999111111 (entered in the number field) with an associated identifier ''Steven C at work'' in the name field.

The micro-processor 13 has ports for coupling to the interfaces 5a,5b, and an alert module 15 that typically contains a speaker, vibrator motor and associated drivers. Also, micro-processor 13 has ports for coupling to two outer audio transducers in the form of an outer microphone 5e and an outer speaker 5d; and two inner audio transducers in the form of an inner microphone 6e and an inner speaker 6d. The character Read only memory 14 stores code for decoding or encoding text messages that may be received by the communication unit 2. In this embodiment the character Read

Only Memory 14 also stores operating code (OC) for micro-processor 13 and code for performing functions associated with the device 1.

The radio frequency communications unit 2 is a combined receiver and transmitter having a common antenna 7. The communications unit 2 has a transceiver 8 coupled to antenna 7 via a radio frequency amplifier 9. The transceiver 8 is also coupled to a combined modulator/demodulator 10 that couples the communications unit 2 to the processor 3.

Referring to Figs. 2 and 3 there is illustrated a first embodiment of the closeable radio communications device 1 that has a housing 21 with two portions 22, 23 movably mounted to each other to allow relative movement of the portions 22,23 between a closed position of Fig 2 and an opened position of Fig 3. Disposed, or partially disposed, in the housing 21 are the components of Fig.1 including the transceiver 8 and processor 3.

The relative movement, as shown in this embodiment, is achieved by the portions 22,23 being pivotally mounted to each other about a pivotal axis A. In the closed position of Fig 2 the outer user interface 5a of the screen 5c and the keypad 5b are visible and accessible by a user, the screen 5c and a keypad 5b being disposed in portion 22. Also, the outer microphone 5e and outer speaker 5d are audibly accessible and operable when the housing 21 is in the closed position. In contrast, the inner user interface 6a of the screen 6c and the keypad 6b are totally hidden (sandwiched between portions 22,23) when the housing 21 is in the closed position; and the two inner audio transducers namely the inner microphone 6e and inner speaker 6d are audibly inaccessible (sandwiched between

portions 22,23) and inoperable when the housing 21 is in the closed position.

In other embodiments the inner user interface 6a may be only partially hidden or partially accessible when the housing 21 is in the closed position. Also, as clearly shown in Fig. 2 the closeable radio communications device 1 has a protrusion 24, on the housing 21, for co-acting with the housing position detector 19 to generate the position signal (PS) when the housing 21 is moved to the opened position as shown in Fig. 3. Shown in the opened position of Fig. 3 is the inner user interface 6a of the screen 6c and the keypad 6b that are accessible and visible. Furthermore, the two inner audio transducers namely the inner microphone 6e and inner speaker 6d are audibly accessible and operable when the housing 21 is in the opened position. In addition, the protrusion 24 is shown co-acting with the housing position detector 19 thereby generating the position signal (PS) sent to microprocessor 13 that results in the inner microphone 6e and inner speaker 6d becoming operable and the two outer audio transducers, namely outer microphone 6e and outer speaker 6d, becoming inoperable when the housing 21 is moved to the opened position.

As shown in Figs 2 and 3, the inner microphone 6e is mounted in one of the two portions 23 and the inner speaker 6d is mounted in the other one of the two portions 22. Also, outer microphone 5e and the outer speaker 5d are mounted on the same one of the two portions 22. In use, when the housing 21 is in the closed position a user can initiate an outgoing communication call through the transceiver 8 by actuation of the outer user interface 5a. In addition during the communication call, when the housing is in the closed position, the outer speaker 5d and outer microphone 5e are operable. In this regard, the speaker 5d and outer microphone

5e may operate as a hands-free speakerphone in which a user may place the device 1 on a table or desk whilst communicating in the call via the speaker 5d and outer microphone 5e.

Referring to Figs 4 and 5 there is illustrated a second embodiment of the closeable radio communications device 1 that has a housing 41 with two portions 42, 43 movably mounted to each other to allow relative movement of the portions 42,43 between the closed position of Fig 4 and the opened position of Fig 5. The relative movement, as shown in this embodiment, is achieved by the portions 42,43 being pivotally mounted about a pivotal axis. In the closed position of Fig 4 an outer user interface 45a (in the form of a keypad) is visible and accessible by a user, and is disposed in portion 42. Also, an outer speaker 45d and outer microphone 45e are audibly accessible and operable when the housing 41 is in the closed position. In contrast, an inner user interface 46a (in the form of a touch screen) is viewable through a screen 48 but not physically accessible when the housing 41 is in the closed position. In addition, an inner speaker 46d is audibly inaccessible (sandwiched between portions 42,43) and inoperable when the housing 41 is in the closed position. Also, as clearly shown in Fig. 5 housing position detector 19 is mounted in portion 43 and as will be apparent to a person skilled in the art, generates the position signal (PS) when the housing 41 is moved from the closed position.

As illustrated, the outer microphone 45e is mounted in one of the two portions 43 and the outer speaker 45d is mounted in the other one of the two portions 42. As shown in the opened position of Fig. 5 is the inner user interface 46a in the form of a touch screen that is accessible and completely visible. Furtheremore, the outer microphone 45e and inner speaker 46d are audibly accessible and operable when

the housing 21 is in the opened position and the and outer speaker 45d being inoperable when the housing 21 is moved to the opened position.

Referring to Figs 6 and 7 there is illustrated a third embodiment of the closeable radio communications device 1 that has a housing 61 with two portions 62, 63 movably mounted to each other to allow relative movement of the portions 62,63 between the closed position of Fig 6 and the opened position of Fig 7. The relative movement, as shown in this embodiment, is achieved by the portions 62,63 being pivotally mounted about a pivotal axis. In the closed position of Fig 6 an outer user interface 65a (in the form of a keypad) is visible and accessible by a user, and is disposed in portion 62. Also, an outer speaker 65d and outer microphone 65e are audibly accessible and operable when the housing 61 is in the closed position. In contrast, an inner user interface 66a (in the form of a touch screen) is viewable through a screen 68 but not physically accessible when the housing 61 is in the closed position. In addition, an inner speaker 66d is audibly inaccessible and inoperable when the housing 61 is in the closed position. Also, as clearly shown in Fig. 7 housing position detector 19 is mounted in portion 63 and generates the position signal (PS) when the housing 61 is moved from the closed position toward the opened position.

As illustrated, the outer microphone 65e and the outer speaker 65d are mounted in the same portion 63. As shown in the opened position of Fig. 7 is the inner user interface 66a in the form of a touch screen that is accessible and completely visible. Furthermore, the outer microphone 65e and inner speaker 66d are audibly accessible and operable when the housing 21 is in the opened position and the outer speaker 65d

being inoperable when the housing 21 is moved to the opened position.

Referring to Figs 8 and 9 there is illustrated a fourth embodiment of the closeable radio communications device 1 that has a housing 81 with two portions 82, 83 movably mounted to each other to allow relative movement of the portions 82,83 between the closed position of Fig 8 and the opened position of Fig 9. The relative movement, as shown in this embodiment, is achieved by the portions 82,83 being pivotally mounted about a pivotal axis. In the closed position of Fig 8 an outer user interface 85a (in the form of a keypad) is visible and accessible by a user, and is disposed in portion 82. Also, an outer speaker 85d and outer microphone 85e are audibly accessible and operable when the housing 81 is in the closed position. In contrast, an inner user interface 86a (in the form of a touch screen) is viewable through a screen 88 but not physically accessible when the housing 81 is in the closed position. In addition, an inner microphone 86e is audibly inaccessible and inoperable when the housing 81 is in the closed position. Also, as clearly shown in Fig. 9 housing position detector 19 is mounted in portion 83 and generates the position signal (PS) when the housing 81 is moved from the closed position toward the opened position.

As illustrated, the outer microphone 85e and the outer speaker 85d are mounted in the same portion 83. As shown in the opened position of Fig. 9 is the inner user interface 86a in the form of a touch screen that is accessible and completely visible. Also, the outer speaker 85d and inner microphone 86e are audibly accessible and operable when the housing 21 is in the opened position and the outer microphone 85e being inoperable when the housing 21 is moved to the opened position.

In Fig. 10 there is illustrated a method 100 for selective operation of the audio transducers of a closeable radio communications device 1. The method 100 provides for selective operation of audio transducers such a the outer speaker 5d, outer microphone 5e, inner speaker 6d and inner microphone 6e. The method 100 includes effecting 105 a communications call through a transceiver 8 of the device 1. This communications call (communication) is effected by suitable actuation of either of the user interfaces 5a or 6a depending on an initial position of the housing 21 (e.g. depending on whether the housing is in the opened or closed position). Such a communications call can be effected by dialling a telephone number whilst the housing 21 is in the closed or opened position. Also, the communications call can be effected by accepting an incoming call whilst the housing 21 is in the closed or opened position.

Next a detecting test 110 provides for detecting movement of the two portions 22,23 between the closed position and the opened position. If the detecting test 110 detects, by reading the positions signals (PS) from the position detector 19, that the housing 21 moves from the closed to the opened position then a selectively inactivating step 115 provides for selectively inactivating operation of at least one of the audio transducers. More specifically, the selectively inactivating step 115 provides for selectively inactivating at least one of the outer audio transducers, typically the outer speaker 5d when the detecting determines the movement of the two portions 22,23 between the closed position to the opened position. However, both the outer speaker 5d and outer microphone 5e can be inactivated at step 115.

Next, at a selectively activating step 120 provides for selectively activating operation of at least one of the transducers when the detecting 110 determines the movement of the two portions 22,23 between the closed position to the opened position. Again more specifically, the selectively activating step 120 provides for selectively activating at least one of the inner audio transducers, typically the inner speaker 6d. However, both, or either, the inner speaker 6d and inner microphone 6e can be inactivated at step 115.

If at the detecting test 110, by reading the positions signals (PS) from the position detector 19, it is determined that the housing 21 has moved to the closed position then a selectively inactivating step 125 provides for selectively inactivating operation of at least one of the audio transducers. This detecting test 110 again determines the movement of the two portions 22,23 between the opened position to the closed position or vice versa. The selectively inactivating step 125 provides for selectively inactivating at least one of the inner audio transducers, typically the inner speaker 6d. However, both the inner speaker 6d and inner microphone 6e can be inactivated at step 125.

Next, a selectively activating step 130 provides for selectively activating operation of at least one of the transducers when the detecting 110 determines the movement of the two portions 22,23 between the opened position to the closed position. The selectively activating step 130 provides for selectively activating at least one of the outer audio transducers, typically the outer speaker 6d. However, both, or either, the inner speaker 5d and inner microphone 5e can be inactivated at step 125.

After either steps 120 or 130 a test 140 is effected to determine if the communications call has ended. If the call has ended then the method 100 terminates at an end step 150. Alternatively, if the call is still in progress then the method returns to the detecting test 110.

Advantageously, the present invention provides selectively inactivating and activating audio transducers during a communication call. In his regard, the outer audio transducers are operable when the housing is in the closed position and when the housing is moved to the opened position at least one of the outer audio transducers becomes inoperable. Typically, the invention provides for selectively inactivating the outer speaker so that privacy of a call can be effected so that the outer speaker (perhaps performing as a speakerphone speaker) does not emit part of a communications call. Thus, it will be apparent to a person skilled in the art that a communications call can be maintained whilst a user can flip the housing 21 between the opened and closed position, and vice versa, to selectively activate and inactivate the audio transducers. For instance, when in the closed position the device operates in a similar manner to a candy bar telephone during a communications call and when the sensor 19 detects that the housing 21 moves to the opened position the communications calls continues and selective inactivation of at least one outer audio transducer and selective activation of at least one inner audio transducer typically results. Also, if the housing is in the closed position and the device 100 receives an incoming call, a user can quickly answer the call by actuating the outer user interface 5a and effect communications through the outer audio transducers. This feature can be advantageous when a user cannot readily or immediately move the device 100 to the

opened position to effect communications or use an earpiece accessory.

The detailed description provides preferred exemplary embodiments only, and is not intended to limit the scope, applicability, or configuration of the invention. Rather, the detailed description of the preferred exemplary embodiments provides those skilled in the art with an enabling description for implementing preferred exemplary embodiments of the invention. It should be understood that various changes may be made in the function and arrangement of elements without departing from the spirit and scope of the invention as set forth in the appended claims. For instance, although a clamshell type device has been illustrated, other closeable devices may be used such as flip telephones or rotatable two part telephones typical examples of which are the Motorola(R) V70™ and V80™ cellphones.

WE CLAIM:

1. A closeable radio communications device comprising:

a housing having at least two portions movably mounted to each other to allow relative movement of the portions between a closed position and an opened position;

a user interface;

a transceiver disposed in the housing;

at least two outer audio transducers audibly accessible when the housing is in the closed position, the outer audio transducers comprising an outer speaker and an outer microphone;

at least one inner audio transducer audibly accessible when the housing is in the opened position and audibly inaccessible when the housing is in the closed position; and

a processor disposed in the housing and coupled to the user interface, wherein in use, when the housing is in the closed position communication through the transceiver is effected by actuation of the user interface, and wherein during the communication the outer audio transducers are operable when the housing is in the closed position and when the housing is moved to the opened position at least one of the outer audio transducers becomes inoperable whilst the communication is maintained.

2. A closeable radio communications device as claimed in claim 1, wherein the at least one outer audio transducer includes an outer speaker and outer microphone that are audibly accessible when the housing is in the closed position.

3. A closeable radio communications device as claimed in claim 2, wherein the outer speaker and outer microphone are operable when the housing is in the closed position.

4. A closeable radio communications device as claimed in claim 1, wherein the at least one inner audio transducer includes an inner speaker that is audibly inaccessible when the housing is in the closed position.

5. A closeable radio communications device as claimed in claim 4, wherein the inner speaker is inoperable when the housing is in the closed position.

6. A closeable radio communications device as claimed in claim 5, wherein the inner speaker is audibly accessible and operable when the housing is in the opened position.

7. A closeable radio communications device as claimed in claim 3, wherein the outer speaker becomes inoperable when the housing is moved to the opened position.

8. A closeable radio communications device as claimed in claim 4, wherein the at least one inner audio transducer includes an inner microphone that is audibly inaccessible when the housing is in the closed position.

9. A closeable radio communications device as claimed in claim 8, wherein the inner microphone is inoperable when the housing is in the closed position.

10. A closeable radio communications device as claimed in claim 9, wherein the inner microphone is audibly accessible and operable when the housing is in the opened position.

11. A closeable radio communications device as claimed in claim 3, wherein the outer microphone becomes inoperable when the housing is moved to the opened position.

12. A closeable radio communications device as claimed in claim 8, wherein the inner microphone is mounted in one of the two portions and the inner speaker is mounted in the other one of the two portions.

13. A closeable radio communications device as claimed in claim 3, wherein the outer microphone is mounted in one of the two portions and the outer speaker is mounted in the other one of the two portions.

14. A closeable radio communications device as claimed in claim 3, wherein the outer microphone and the outer speaker are mounted on the said one of the two portions.

15. A closeable radio communications device as claimed in claim 1, further including a housing position detector coupled to the processor to thereby control operability of the outer audio transducers.

16. A closeable radio communications device as claimed in claim 1, wherein the two portions are pivotally mounted to each other.

17. A closeable radio communications device as claimed in claim 1, wherein the user interface is accessible by a user when the housing is in the closed position.

18. A method for selective operation of audio transducers of a closeable radio communications device having housing with at least two portions movably mounted to each other to allow relative movement of the portions between a closed position and an opened position, the method including:

effecting a communications call through a transceiver of the device;

detecting movement of the two portions between the closed position and the opened position;

selectively inactivating operation of at least one of the transducers when the detecting determines the movement of the two portions between the closed position and the opened position.

19. A method as claimed in claim 18, wherein the selectively inactivating provides for inactivating an outer speaker.

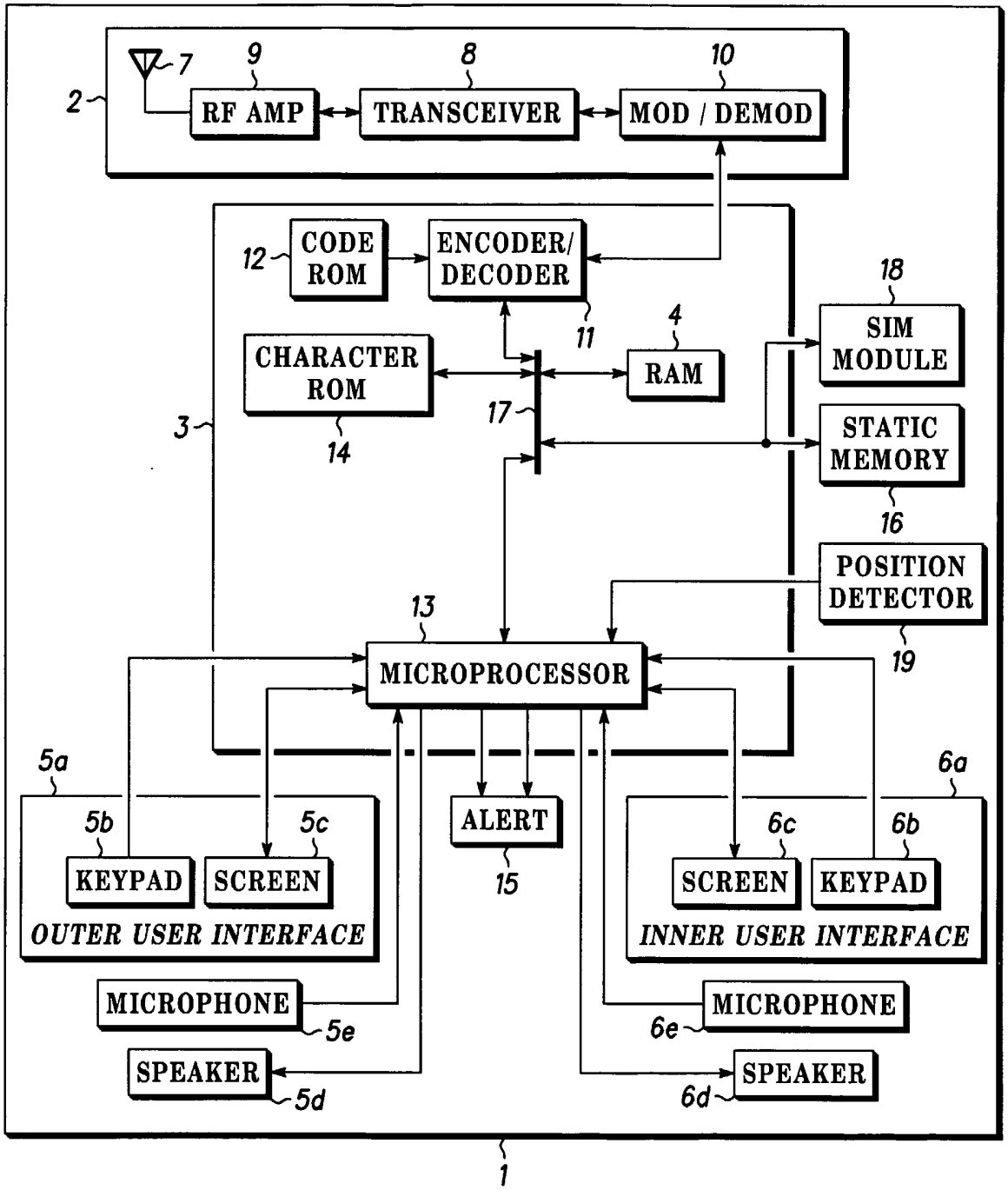
20. A method as claimed in claim 18, wherein the selectively inactivating provides for inactivating an inner speaker.

21. A method as claimed in claim 19, wherein the outer speaker is audibly accessible when the housing is in the closed position.

22. A method as claimed in claim 18, wherein there is a further step of selectively activating operation of at least one of the transducers when the detecting determines the movement of the two portions between the closed position to the opened position.

23. A method as claimed in claim 18, wherein the selectively inactivating provides for activating an inner speaker.

24. A method as claimed in claim 23, wherein the inner speaker is audibly inaccessible and inoperable when the housing is in the closed position.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STATIC MEMORY
16
POSITION DETECTOR
19
13
MICROPROCESSOR
5a
6a
5b
5c
6c
6b
KEYPAD
SCREEN
ALERT
15
SCREEN
KEYPAD
OUTER USER INTERFACE
INNER USER INTERFACE
MICROPHONE
5e
MICROPHONE
6e
SPEAKER
5d
SPEAKER
6d
1

FIG. 1

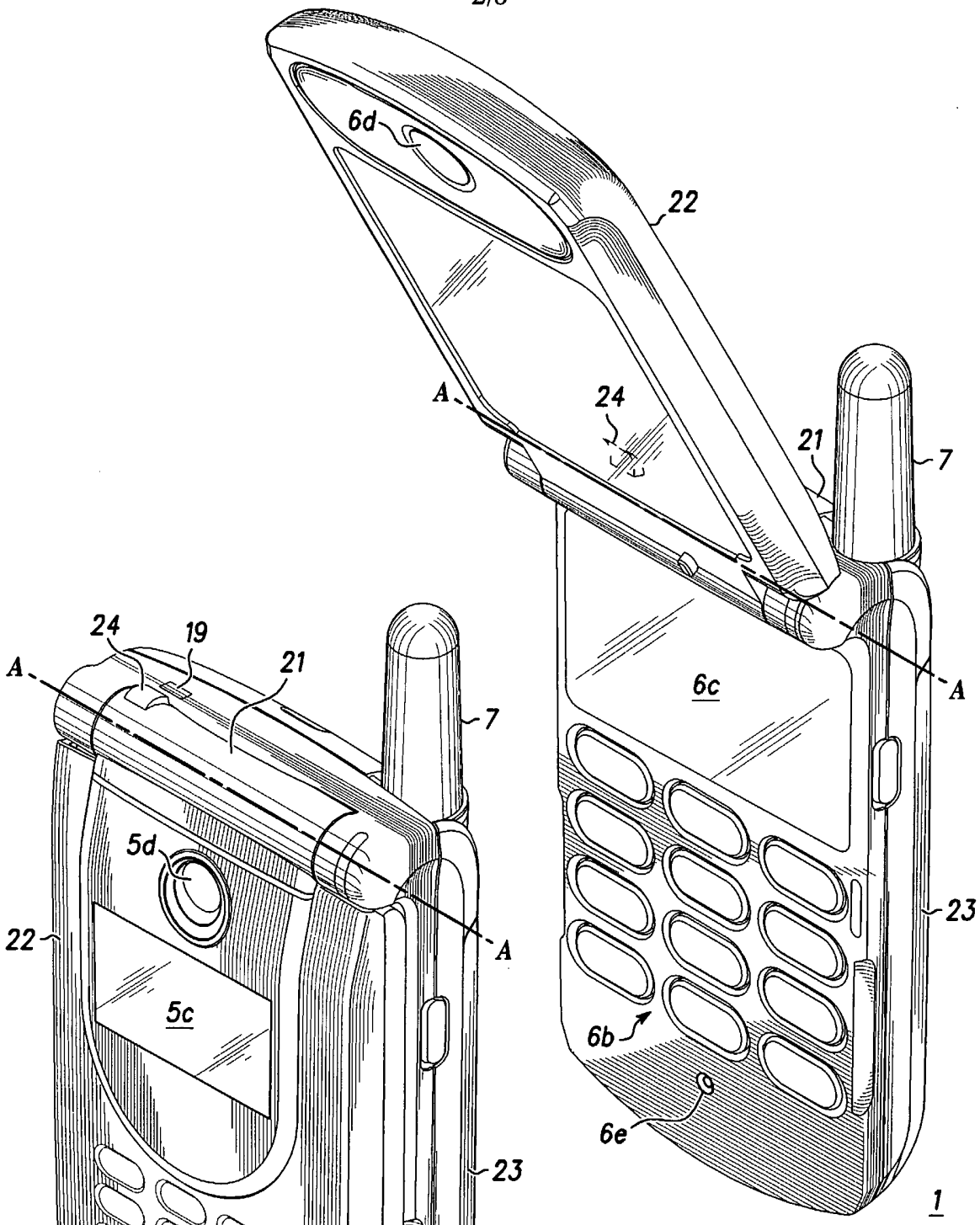


FIG. 3

FIG. 2

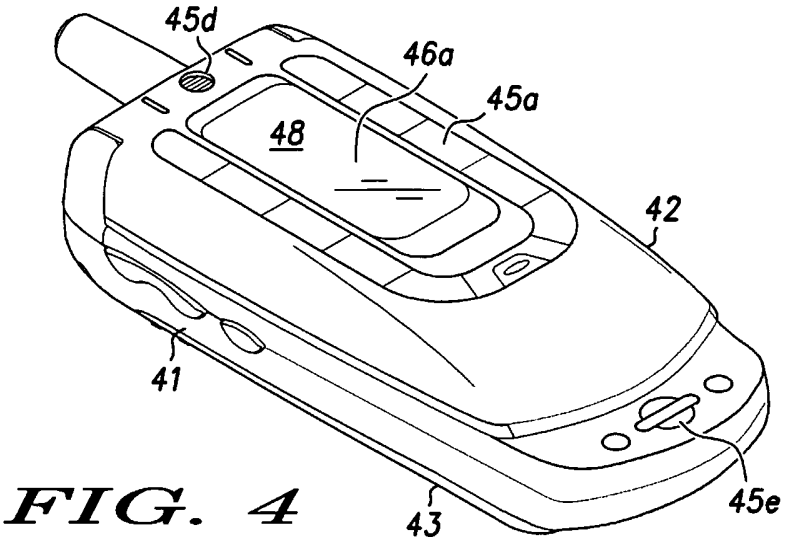


FIG. 4

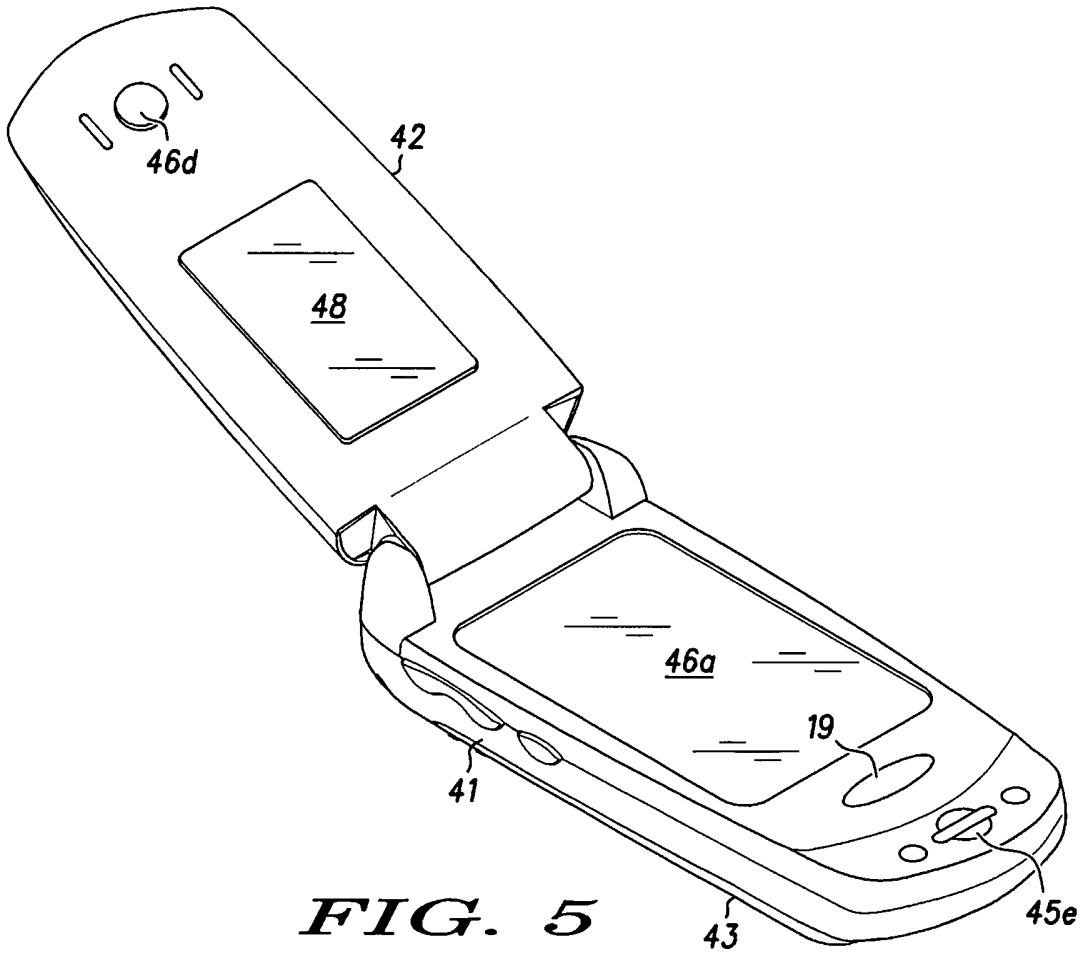


FIG. 5

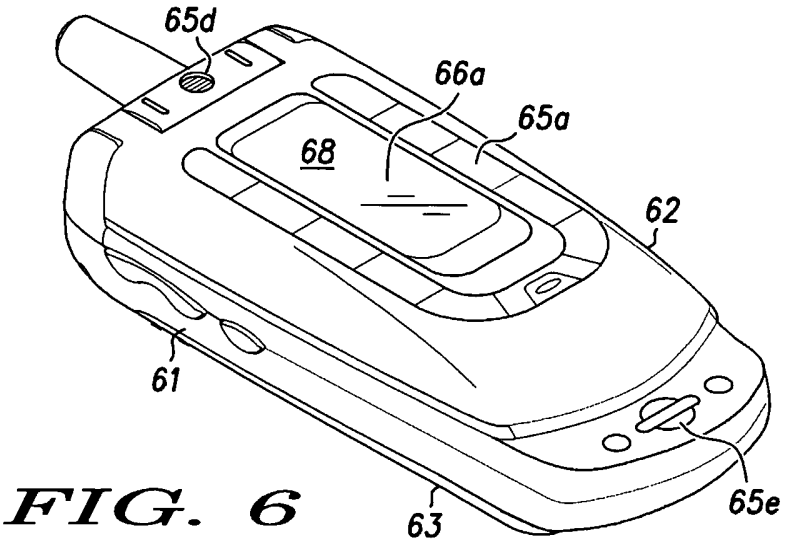


FIG. 6

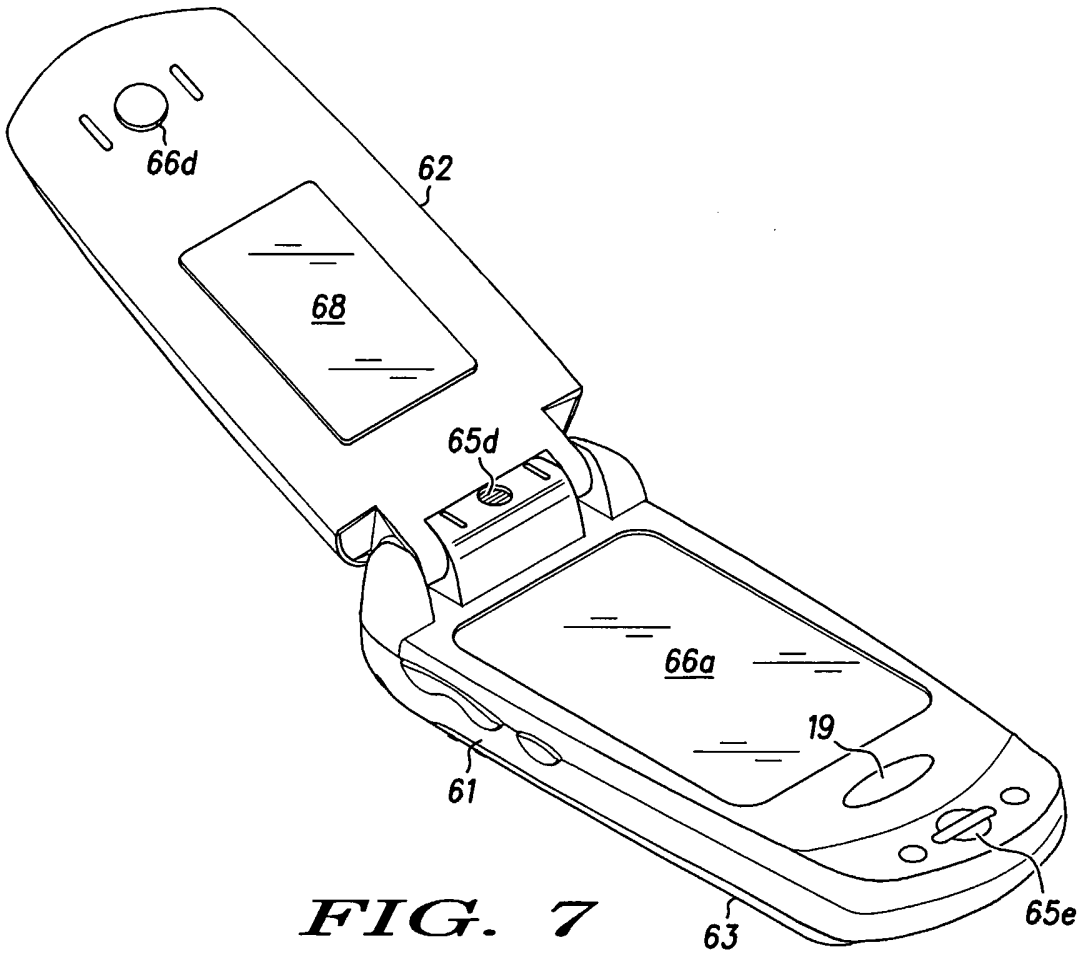


FIG. 7

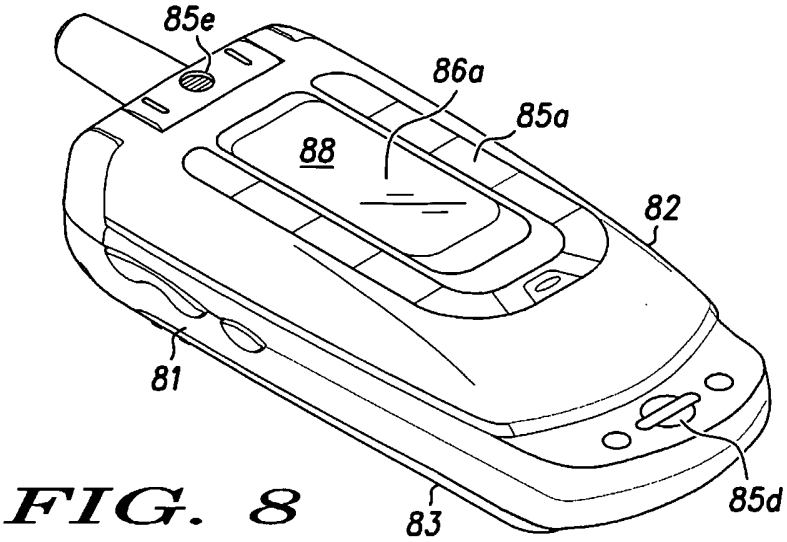


FIG. 8

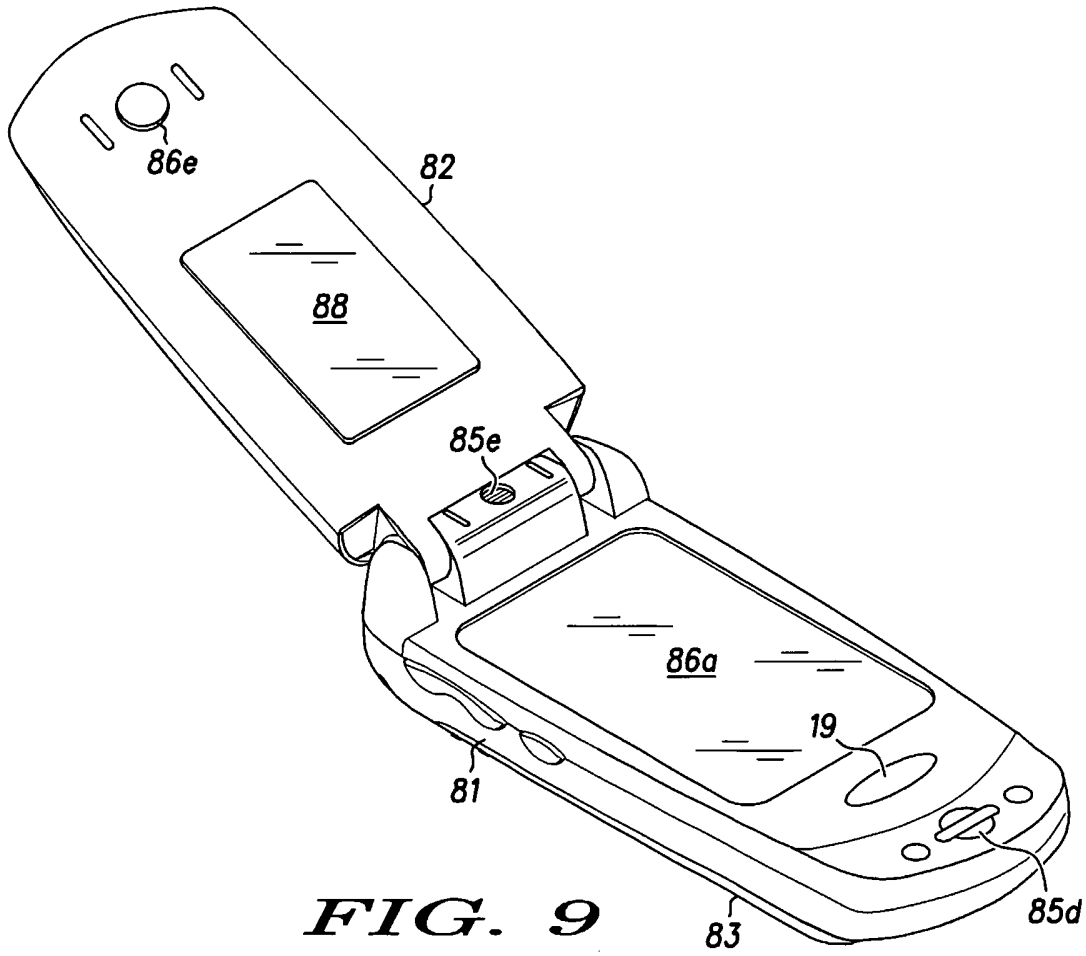


FIG. 9

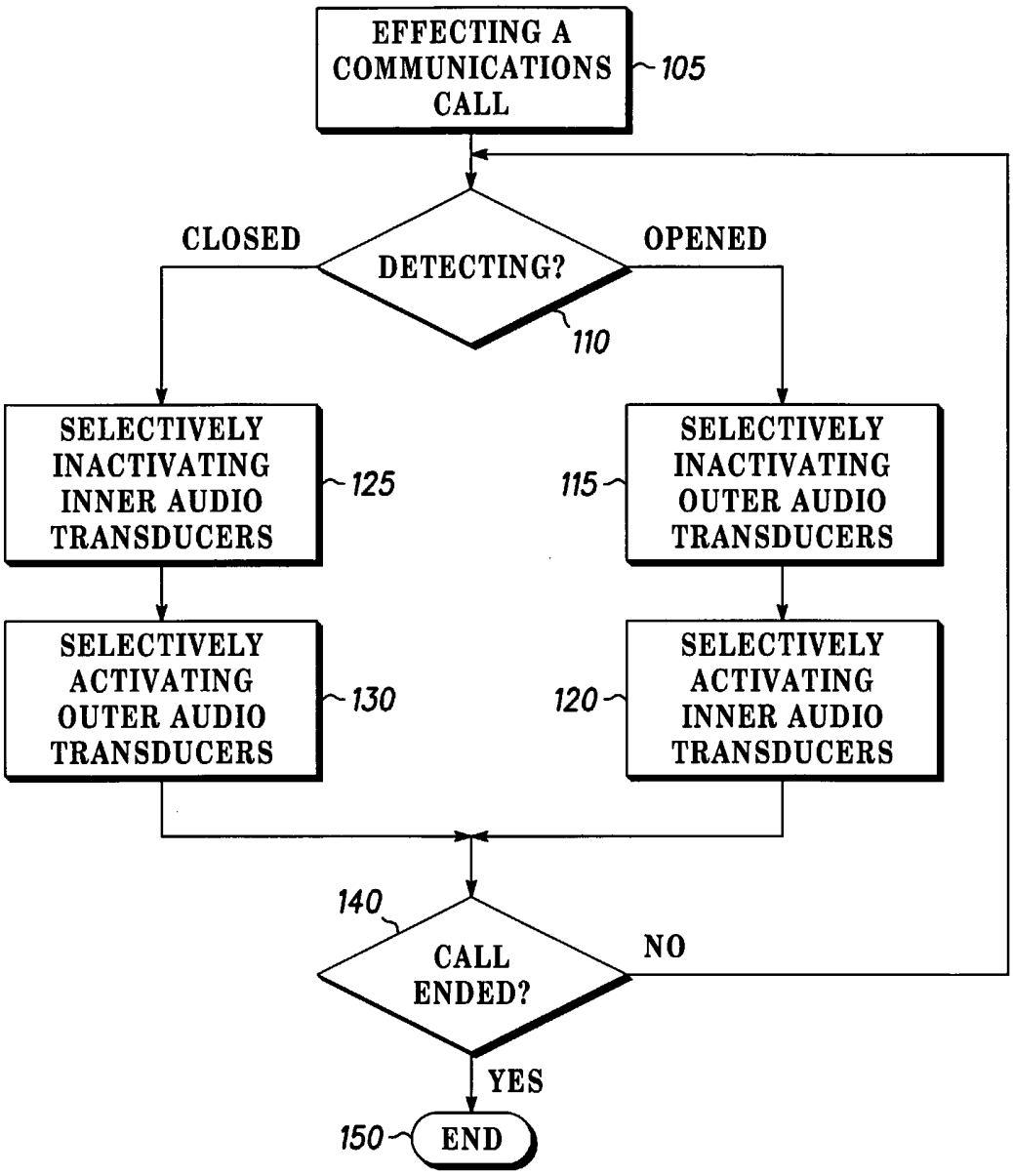
EFFECTING A COMMUNICATIONS CALL
105
DETECTING?
110
CLOSED
OPENED
SELECTIVELY INACTIVATING INNER AUDIO TRANSDUCERS
125
SELECTIVELY INACTIVATING OUTER AUDIO TRANSDUCERS
115
SELECTIVELY ACTIVATING OUTER AUDIO TRANSDUCERS
130
SELECTIVELY ACTIVATING INNER AUDIO TRANSDUCERS
120
140
CALL ENDED?
NO
YES
150
END
100

FIG. 10