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(56) Documents Cited:
GB 2384696 A **GB 2369044 A**
GB 2336064 A **GB 1561097 A**
JP 070147699 A **JP 2002287745 A**

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(54) Abstract Title: **Travelling case with inbuilt speaker unit**

(57) A travelling case 1 comprises a body 3 defining an enclosure and a speaker unit 7 for receiving a sound output, wherein the speaker unit includes at least one sound transducer 9 which is mounted to the body such that the enclosure defined a sound box. The body may be rigid, or of rigid plastics. The sound transducer may be located at an opening in the wall of the body or it may be an exciter attached to the wall of the body which vibrates it in a distributed or non-distributed manner. Alternatively the transducer may comprise a rigid panel mounted to the body and an exciter which is attached to the rigid panel to vibrate it. The travelling case may be a suitcase; it may have an amplifier 17 for receiving a sound input 23 connected to the speaker unit. The travelling case may be part of a sound system, with a portable sound device 15 such as a radio, laptop computer, CD or mp3 player for providing a sound output 21.

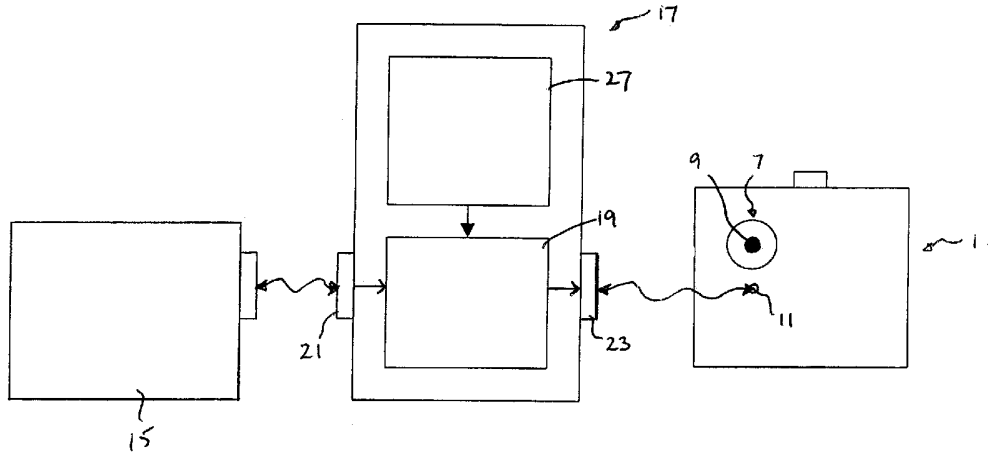

Fig. 3

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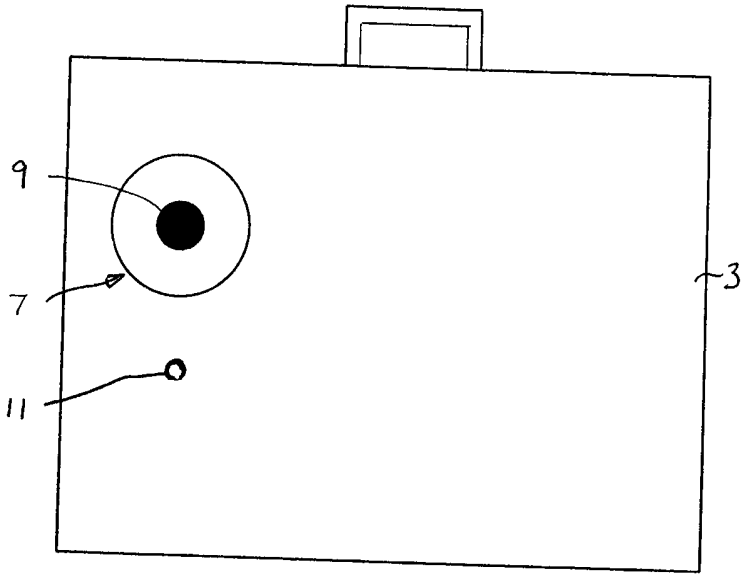

Fig. 1

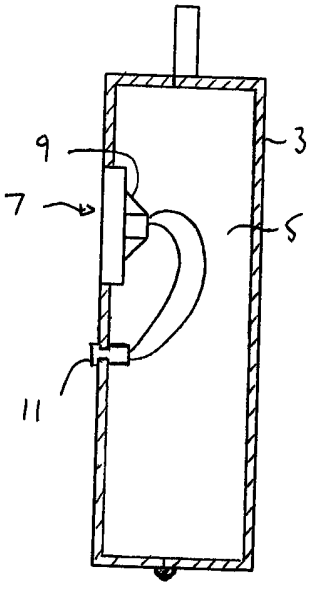

Fig. 2

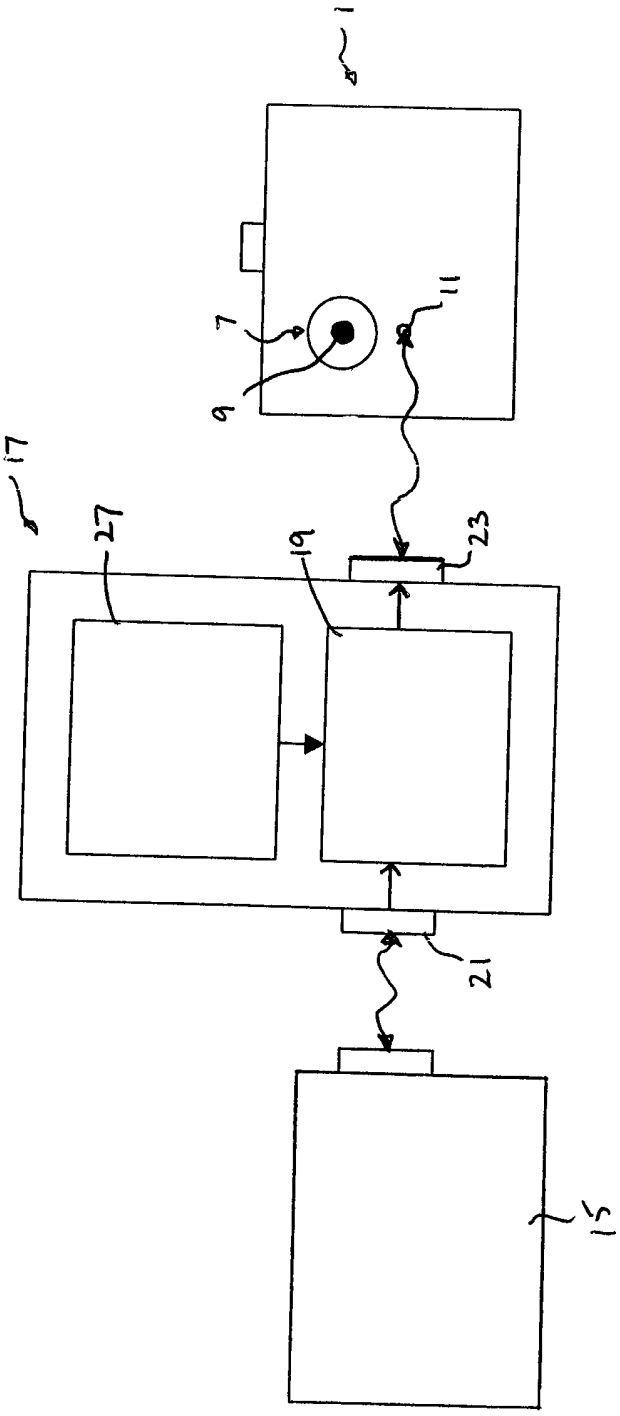

Fig. 3

TRAVELLING CASE INCORPORATING A SPEAKER UNIT

The present invention relates to a portable travelling case, in particular, but not exclusively, a suitcase, which incorporates a speaker unit for generating a sound output as music or voice.

Portable devices which are capable of playing music, such as radios, laptop computers, portable CD players, mp3 players, etc, are becoming increasingly popular, particularly as a result of their decreasing price, improved sound output and extended battery life, and the development of storage media which allow for the storage of large numbers of songs.

Such portable devices are in many ways superior to the average home hi-fi system, but the sound is generally output using headphones, or occasionally, small bespoke portable speaker units.

As regards headphones, the quality of the sound output can be relatively good, but the sound cannot be shared with anyone else, and wearing headphones imposes physical constraints on both movement and activity.

As regards existing portable speaker units, these are battery-amplified speaker units which produce a low-volume and low-quality sound. The generation of lower-frequency bass sounds is essential for the generation of high-quality music, and the generation of such lower-frequency bass sounds is limited by any of the nature of the sound transducer, the power of the amplifier and the size of the sound box in battery-amplified speaker units.

The present inventors have recognized that the use of a travelling case as a sound box is ideally suited for use with portable sound devices, as a travelling case is taken to those very locations where a speaker system would be most useful as a good quality portable speaker.

By providing a speaker unit to a travelling case, in particular a suitcase, the need for a dedicated speaker system, which would necessarily have to be of

comparable size to generate a similar volume and quality of sound, is obviated. Indeed, as will be appreciated, it would not be practical or convenient to transport a dedicated speaker sound box of comparable size to an average-sized suitcase to locations where a speaker system would be useful.

In one aspect the present invention provides a travelling case, comprising a body defining an enclosure, and a speaker unit for receiving a sound input and generating an audible sound output, wherein the speaker unit includes at least one sound transducer which is mounted to the body such that the enclosure defines a sound box.

Preferably, the body comprises a rigid body.

More preferably, the body comprises a rigid plastics body.

Preferably, the at least one sound transducer of the speaker unit is mounted to a wall of the body.

In one embodiment the at least one sound transducer of the speaker unit is located at an opening in the wall of the body.

In another embodiment the at least one sound transducer of the speaker unit comprises an exciter which is attached to the wall of the body and operative to vibrate the same.

Preferably, the exciter is operative to vibrate the wall of the body in a non-distributed manner.

In a further embodiment the at least one sound transducer of the speaker unit comprises a rigid panel which is mounted to the body and an exciter which is attached to the rigid panel and operative to vibrate the same.

Preferably, the travelling case comprises a suitcase.

In one embodiment the travelling case further comprises an amplifier for receiving a sound input and being operatively connected to the speaker unit such as to provide an amplified sound input thereto.

The present invention also extends to a sound system, comprising, in combination, the above-described travelling case and a portable sound device for providing a sound output thereto.

A preferred embodiment of the present invention will now be described hereinbelow by way of example only with reference to the accompanying drawings, in which:

Figure 1 illustrates a side view of a travelling case incorporating a speaker unit in accordance with a first embodiment of the present invention;

Figure 2 illustrates a vertical sectional view of the travelling case of Figure 1; and

Figure 3 schematically illustrates the speaker unit of the travelling case of Figure 1 where connected to a portable sound device through an amplifier.

The travelling case 1 comprises a body 3, in this embodiment a rigid plastics body, which defines an enclosure 5 which is utilized to store items, such as clothes, during transport of the same, and acts as a sound box, as will be described in more detail hereinbelow.

In this embodiment the travelling case 1 comprises a suitcase, but could comprise any other kind of case, such as a vanity case.

The travelling case 1 further comprises a speaker unit 7 which comprises at least one sound transducer 9, which together with the enclosure 5 is operative to produce a sound output, and a sound input connector 11, in this embodiment a standard speaker wire terminal, which is mounted to the

body 3 of the travelling case 1, for providing a means of connection to a portable sound device 15, in this embodiment through an amplifier 17, as schematically illustrated in Figure 3.

In this embodiment the at least one sound transducer 9 of the speaker unit 7 comprises a conventional cone drive mechanism which is presented at an opening in a wall of the body 3 of the travelling case 1, typically as defined by an apertured section or a guard protecting the opening.

In another embodiment the at least one sound transducer 9 of the speaker unit 7 could comprise a panel exciter which is bonded to a wall of the body 3 of the travelling case 1 and is operative to vibrate the wall of the body 3 of the travelling case 1 in the manner of a conventional cone drive mechanism. In one embodiment the panel exciter is operated such as to vibrate the wall of the body 3 of the travelling case 1 in a non-distributed manner. With this configuration, there is no need for an opening in the wall of the body 3 of the travelling case 1.

In a further embodiment the at least one sound transducer 9 of the speaker unit 7 could comprise a distributed mode loudspeaker, such as an NXT loudspeaker (RTM), which comprises a rigid panel which is fixed to a wall of the body 3 of the travelling case 1 and a panel exciter which is operative to vibrate the rigid panel in a distributed manner. With this configuration, there is no need for an opening in the wall of the body 3 of the travelling case 1.

The amplifier 17 comprises an amplifier circuit 19 which includes a first, sound input connector 21, in this embodiment a standard jack plug, for providing a means of connection to the portable sound device 15 and a second, sound output connector 23, in this embodiment a standard speaker wire terminal, for providing a means of connection with the sound input connector 11 of the speaker unit 7, and a mains-powered transformer 27 for powering the amplifier circuit 19.

In this embodiment the sound control, such as volume and pitch, are controlled from the portable sound device 15, and, as such, the amplifier 17 does not include any sound control.

In this embodiment the transformer 27 is adapted to accept mains voltage at either 110 V or 240 V.

In operation, a user connects his/her portable sound device 15, for example, an mp3 player, through the amplifier 17 to the speaker unit 7 of the travelling case 1, in this embodiment through the sound input connector 11 of the speaker unit 7, and operates his/her portable sound device 15 to deliver a sound output, typically a music output, to the speaker unit 7 of the travelling case 1, and the speaker unit 7 in combination with the enclosure 5 of the travelling case 1 delivers a high-quality audible sound output.

Finally, it will be understood that the present invention has been described in its preferred embodiment and can be modified in many different ways without departing from the scope of the invention as defined by the appended claims.

For example, in one modification, the amplifier 17 could be integrated into the travelling case 1.

In another modification, the sound input connector 11 of the speaker unit 7, instead of being mounted to the body 3 of the travelling case 1, could be provided on a lead which is accessed by opening the body 3 of the travelling case 1.

In addition, although embodied in relation to use with a portable sound device 15, the travelling case 1 could find application with a standard home hi-fi system, where the travelling case 1 is utilised as a stand-alone speaker.

CLAIMS

1. A travelling case, comprising a body defining an enclosure, and a speaker unit for receiving a sound input and generating an audible sound output, wherein the speaker unit includes at least one sound transducer which is mounted to the body such that the enclosure defines a sound box.

2. The travelling case of claim 1, wherein the body comprises a rigid body.

3. The travelling case of claim 2, wherein the body comprises a rigid plastics body.

4. The travelling case of any of claims 1 to 3, wherein the at least one sound transducer of the speaker unit is mounted to a wall of the body.

5. The travelling case of claim 4, wherein the at least one sound transducer of the speaker unit is located at an opening in the wall of the body.

6. The travelling case of claim 4, wherein the at least one sound transducer of the speaker unit comprises an exciter which is attached to the wall of the body and operative to vibrate the same.

7. The travelling case of claim 6, wherein the exciter is operative to vibrate the wall of the body in a non-distributed manner.

8. The travelling case of claim 4, wherein the at least one sound transducer of the speaker unit comprises a rigid panel which is mounted to the body and an exciter which is attached to the rigid panel and operative to vibrate the same.

9. The travelling case of any of claims 1 to 8, wherein the travelling case comprises a suitcase.

10. The travelling case of any of claims 1 to 9, further comprising an amplifier for receiving a sound input and being operatively connected to the speaker unit such as to provide an amplified sound input thereto.

11. A sound system, comprising, in combination, the travelling case of any of claims 1 to 10 and a portable sound device for providing a sound output thereto.

12. A travelling case substantially as hereinbefore described with reference to Figures 1 and 2 of the accompanying drawings.

13. A sound system substantially as hereinbefore described with reference to Figures 1 and 2 of the accompanying drawings, optionally in conjunction with Figure 3 of the accompanying drawings.

Application No: GB0404276.8 **Examiner:** Yasmin Wilson

Claims searched: 1-13 **Date of search:** 1 June 2004

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular reference
X	X:1-5,10,11	GB2336064 A (Draycott) Whole document
X	1-4	GB 2369044 A (Holland) whole document
X	1-5, 10, 11	JP2002287745 A (Yuhara) English abstract and Figures: guitar case 1, speakers 4p and 4q, amplifier section 3
X,Y	X:1, 4, 8 & 11, Y:6 & 7	GB2384696 A (Hoisden) Figure 2: case 1, loudspeaker 25 comprising transducer 29, and flat panel resonant surface 31.
X	1, 4 , 9 & 10	GB 1561097 A (Tei-Mo Chui) Figures: suitcase1, speakers 82A and 82B
Y	6,7	JP07147699 A (Yoshino) - Whole document

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[W] :

A4G; H4J

Worldwide search of patent documents classified in the following areas of the IPC[07]

A45C; B65D; G10G; G11B; H04R

The following online and other databases have been used in the preparation of this search report