

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
1 February 2007 (01.02.2007)

PCT

(10) International Publication Number
WO 2007/013859 A1

(51) International Patent Classification:

H04R 1/24 (2006.01) *H04R 1/40* (2006.01)
H04R 5/00 (2006.01) *H04R 5/02* (2006.01)
H04R 9/06 (2006.01)

(21) International Application Number:

PCT/SG2006/000210

(22) International Filing Date: 25 July 2006 (25.07.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

11/190,173 25 July 2005 (25.07.2005) US

(71) Applicant (for all designated States except US): **CREATIVE TECHNOLOGY LTD** [SG/SG]; 31 International Business Park Creative Resource, Singapore 609921 (SG).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **CHANG, Thean Kuie, Christopher** [SG/SG]; Block 683C Jurong West Street 64, #16-143, Singapore 643683 (SG). **GAN, Hui Ling** [SG/SG]; Block 52 Sim's Place #09-142, Singapore 380052 (SG). **GOH, Aik Hee** [SG/SG]; 2D Hong San Walk #02-12, Palm Gardens, Singapore 689050 (SG). **SUPRAPMO, Susimin** [ID/SG]; Block 22 Bukit Batok Street 52, #28-02 Guilin View, Singapore 659245 (SG).

(74) Agent: **ALBAN TAY MAHTANI & DE SILVA**; 39 Robinson Road #07-01, Robinson Point, Singapore 068911 (SG).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

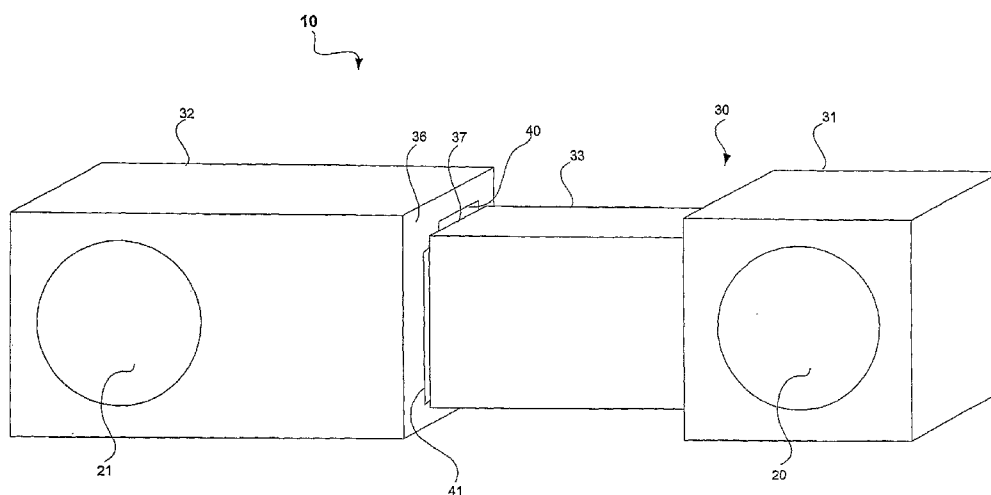
— of inventorship (Rule 4.17(iv))

Published:

— with international search report

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.

(54) Title: PORTABLE SPEAKER ASSEMBLY



(57) Abstract: A portable speaker assembly having a first driver coupled to a first portion of a telescoping enclosure and a second driver coupled to a second portion of the telescoping enclosure. The telescoping enclosure is movable between a first position and a second position and has an intermediate portion extending outwardly from the first portion and having a telescopically nesting engagement with a second portion. The intermediate portion is able to move telescopically relative to the second portion along a longitudinal axis of the enclosure. The second portion has at least one predetermined void adjacent to the telescopic connection of the intermediate portion with the second portion.

WO 2007/013859 A1

Portable Speaker Assembly

Field of the Invention

- 5 The invention concerns a portable speaker assembly and refers more particularly, though not exclusively, to a portable speaker assembly with an enclosure changeable in volume.

Background of the Invention

10

- The inherent purpose of a portable speaker assembly limits the overall size and weight of the speaker drivers and enclosures used. Typically, to meet these requirements, sound quality is sacrificed. Nevertheless, consumers continually yearn for a sound fidelity comparable to larger speakers. Larger speakers will
- 15 achieve lower frequencies and therefore sound better than smaller speakers, but are bulkier and heavier. This is a disadvantage for portability. Generally, smaller speakers are designed for portability and are either built-in to another device or stand alone. When they are stand alone, they are often in a single enclosure. This makes them more easily transported, but often they cannot produce low
- 20 frequencies, or achieve good stereo separation, because of the small size of the enclosures and the short distance between the drivers. Therefore, there is a trade-off between portability and sound quality.

- Also, most speaker assemblies are a sealed enclosure. Great effort is made to
- 25 ensure a complete seal of the enclosure to maximize the acoustic response. The only forms of enclosures that are not totally sealed are bass reflex, and tuned port speakers. In such a case the enclosure is still fully sealed except for an especially-designed opening for improved low frequency response. It is therefore desirable to provide a portable speaker system having a sound quality obtainable from a larger
- 30 enclosure but provided in an enclosure having a size and shape that ensures compactness in transit, but without the inherent difficulties of sealing the enclosure.

Summary of the Invention

- 35 In a first preferred aspect, there is provided a portable speaker assembly comprising:
- (a) a first and second driver;

(b) a telescoping enclosure movable between a first position and a second position, the telescoping enclosure comprising a first portion, an intermediate portion extending outwardly from the first portion and having a telescopically nesting engagement with a second portion, the intermediate portion
5 being able to move telescopically relative to the second portion along a longitudinal axis of the enclosure;

(c) the first driver being coupled to the first portion and the second driver being coupled to the second portion; and

(d) the second portion having at least one predetermined void
10 adjacent to the telescopic connection of the intermediate portion with the second portion.

The at least one predetermined void may be substantially filled with an air permeable foam material; and the first and second drivers may be oriented such
15 that their primary sound generation direction is substantially perpendicular to the longitudinal axis. The speaker assembly may include an AM/FM tuner. Controls may be provided on the intermediate section, the controls being at least one of: volume, tone, power on/off, AM/FM tuner control and playback control.

20 The second portion may have a port for improving the frequency response of the second portion; and the intermediate portion may have a further port for improving the frequency response of the first portion.

The second portion may have an opening in a side wall through which the
25 intermediate portion passes, the at least one predetermined void being on the periphery of the opening. The intermediate portion may be substantially hollow and may be acoustically connected to the first portion and the second portion. The substantially hollow intermediate portion may include a battery compartment.

30 The opening may have an area that is greater than the intermediate portion cross-sectional area in a plane transverse to the longitudinal axis. The opening area may be greater than the intermediate cross-sectional area by the area of the at least one void.

35 The location, size, shape and number of the at least one void may be controlled to minimize the effect on the telescoping enclosure acoustic response by the at least one void. Alternatively or additionally, the location, size, shape and number of the

at least one void may be controlled to enhance the telescoping enclosure acoustic response. Preferably, there is no seal between the intermediate portion and the second portion. The at least one void may be for reducing friction and rubbing between the second portion and the intermediate portion that may occur when the enclosure is extended or retracted.

There is also provided a method for providing a balanced sound for substantially the full frequency range by allowing the communication of air between an interior of an enclosure and ambient surroundings. The air may be passed through air permeable foam material.

Brief Description of the Drawings

In order that the invention may be fully understood and readily put into practical effect there shall now be described by way of non-limitative example only preferred embodiments of the invention, the description being with reference to the accompanying illustrative drawings.

In the drawings:

Figure 1 is a perspective view of a first preferred embodiment of a portable speaker system;

Figures 2A and 2B are perspective views of the first preferred embodiment of the portable speaker system in retracted and extended positions;

Figure 2C is a perspective view of a second preferred embodiment of the portable speaker system in the extended position; and

Figure 3 is a front elevation view of the first preferred embodiment of the portable speaker system.

Detailed Description of the Drawings

Referring to Figures 1 and 3, a portable speaker system 10 is provided for work or personal use. The system 10 may be used at home or office environment, or when traveling, such as in a hotel room. Typically, the system 10 is expected to be used in combination with a portable media device such as an audio or multimedia device such as, for example, a CD payer, DVD or VCD player, media player, laptop or notebook computer, personal digital assistant, or MP3 player (not shown). The system 10 comprises a first driver 20 and second driver 21, a telescoping

enclosure 30, and at least one predetermined void 40. Preferably, the drivers 20, 21 are able to cover the audible full frequency range or at least a major portion of the audible frequency range.

- 5 The enclosure 30 has a first portion 31 in a telescopically nesting arrangement within a second portion 32, an intermediate portion 33 providing the telescopic engagement of first and second portions 31, 32. The portions 31, 32 are able to telescope along a longitudinal axis of the enclosure 30. The first driver 20 is coupled to the first portion 31 and the second driver 21 is coupled to the second
- 10 portion 32. The drivers 20, 21 are oriented such that their primary sound generation direction is substantially perpendicular to the longitudinal axis. As shown, first and second portions 31, 32 are of similar area in a plane transverse to the longitudinal axis, but are of differing lengths in the direction of the longitudinal axis.
- 15 The intermediate portion 33 telescopically engages in the second portion 32, and is operatively connected to both the first and second portions 31, 32. That is, the first portion 31, second portion 32 and intermediate portion 33 are all substantially hollow. Furthermore, the intermediate portion is open at each end to enable a full acoustic connection to both the first portion 31 and the second portion 32. The
- 20 intermediate portion 33 extends outwardly from a side wall 34 of first portion 31, and passes through an opening 37 in the side wall 36 of the second portion 32. The opening 37 is preferably slightly larger in area than the cross-sectional area of the intermediate portion to facilitate ease of the telescopic movement. The side wall 34 of the first portion has an opening 35 for the acoustic connection of the first
- 25 portion 31 with the intermediate portion 33. The cross-sectional area of the intermediate portion, and the length of the intermediate portion 33, is selected to allow complete telescoping within the second portion 32 without interfering with the second driver 21. In that way the speaker assembly 10 can still be operated in the un-extended position shown in Figure 2A, as well as the fully extended position
- 30 shown in Figures 1 and 2B, or somewhere between them. The intermediate portion 33 may be of any suitable cross-sectional shape such as, for example, triangular, square (as shown), rectangular, elliptical, circular, pentagonal, hexagonal, and so forth. The nature of the voids 40, 41 may also be influenced by the cross-sectional shape of the intermediate portion 33. By having the first portion 31, second portion
- 35 32 and intermediate portion 33 all operatively and acoustically connected, then enclosure 30 has a significantly enlarged volume for the two drivers 20, 21 when in

the extended position, thus improving the acoustic response of the portable speaker 10.

5 The first portion 31 and second portion 32 may each have a flat base so that they can easily stand on a surface, and to facilitate the accurate location of intermediate portion 33 in opening 37.

10 Preferably, there are a number of predetermined voids 40, 41 provided on the outer portion 32 along the sides of the opening 37 for the telescopic connection with the second portion 32. The number of voids 40, 41 may be any suitable number such as, for example, one, two (as shown), three, four, five, and so forth. The voids 40, 41 may be regularly or irregularly spaced around intermediate portion 33, or may be continuous. The voids 40, 41 are on the periphery of the opening 37 and serve to make opening 37 to have an area larger than the cross-sectional area of intermediate portion. In this way the voids 40, 41 are able to communicate air between the interior of the enclosure 30 and the ambient surroundings. The increase in the interior of the enclosure 30 in the extended position (Figure 1) over that of the un-extended position (Figure 2A) enhances the acoustic response of the system 10. Regular extension and retraction of the enclosure 30 is envisaged in ordinary use, and thus the voids 40, 41 also advantageously extend the durability of the system 10 as they minimize friction and rubbing between the side wall 36 and the intermediate portion 33. By controlling the location, size, shape and number of the voids 40, 41 the effect on the acoustic response may be minimized, and may even be enhanced.

25 In a preferred embodiment, sound is improved by the telescopic expansion of the enclosure 30 in a number of ways. First, the interior space of the enclosure 30 is substantially increased, preferably by up to approximately 60%. Second, by extending the enclosure 30, the enclosure 30 provides increased separation of the drivers 20, 21 by an additional measure, preferably by about 60%. Additionally, as there is no sealing around the opening 37, and thus the enclosure of second portion 32 is therefore not sealed, during operation sounds waves are pushed out of the enclosure 30 via the voids 40, 41. As is stated above, by controlling the location, size, shape and number of voids 40, 41 it is possible to enhance certain frequencies. Without a fully sealed enclosure 30, sound reproduction quality is not as precise when compared with a fully sealed enclosure. However, improving the reproduction of certain frequencies will be more noticeable to the listener than a

small loss of precision. Thus the system 10 may be able to provide a balanced sound for substantially the full frequency range.

5 The size, shape and position of the voids 40, 41 may be controlled and selected to enhance certain acoustic characteristics. The drivers 20, 21 and the material of the enclosure 30 are also selected to taking advantage of the known parameters of the voids 40, 41 to achieve certain acoustic characteristics. That is, the equalization curve may be altered to optimize the sound generated by the drivers 20, 21 in consideration of the impact on the acoustic performance provided by the voids 40, 10 41. That impact may be minimizing the adverse effect, or enhancement.

To prevent the ingress of dust particles within the system 10, the voids 40, 41 may be substantially filled with an air permeable foam material. The foam may lead to some insignificant obstruction of the air flow. However, for certain environments 15 and usages, this shortcoming is outweighed by preserving the operational life of the system 10.

In a typical scenario, the enclosure 30 of the system 10 retracts to reduce its size for transport as illustrated in Figure 2A and extends, as illustrated in Figure 2B, to 20 increase its size in use, to generate improved sound. The increase in separation between the primary axes of the drivers 20, 21 in the extended position is a design consideration, preferably based at least in part on the size of the drivers 20, 21, the frequency response desired, and the interior space of the enclosure 30 in the retracted and extended positions. Accordingly, the dimensions illustrated and 25 described are intended to be illustrative only and not limiting as to the scope of the invention.

In one preferred embodiment, the first and second portions 31, 32 are configured with one or more detent mechanisms respectively located in at least one of the 30 inner and outer sections to lock the enclosure in either or both of the extended (open) position and the retracted (closed) position. For example, a first detent mechanism may be located on the inner section 31 to engage a catch concealed in the outer section 32. Suitable detent mechanisms such as ball detents or the like are known to those of skill in the relevant art and therefore further details will not be 35 provided here. In order to lock the enclosure 30 in the extended position, a second detent mechanism may also be located on the inner section 31 of the enclosure 30, for example to engage the same catch.

5 The enclosure 30 is preferably constructed using multiple layers, such that sufficient rigidity is provided along with sound damping qualities. For example, in one preferred embodiment, each of the inner section 31 and outer section 32 of the enclosure 30 is composed of a three layer wall construction for high rigidity and low weight. For a non-limiting example, the outer shell may be formed from deep-drawn aluminum to provide protection, stiffness at a very low weight, and aesthetic appeal. The inner shell is also preferably composed of a rigid material, such as a plastic. The middle layer may be formed from any suitable damping material, for example rigid expanded polyethylene foam, to add rigidity and adhesion between the three layers along with the damping qualities. Although the three layer construction is shown only for the second portion 32, it is understood that the multilayer construction is preferably used also in the first portion 31.

15 In an alternative construction, the plastic inner shell is constructed with ribs that, when adhered to the outer shell, will form an air gap 50, or honeycomb wall. Between the two layers is a layer of rigid polyethylene foam that damps, stiffens, and adheres to the inner and outer layers, forming a lightweight, rigid enclosure.

20 The system 10 is preferably transported in its closed position. In operation, the user expands the system 10 from its retracted position by pulling the ends of the enclosure 30 in opposing directions until the enclosure 30 detents into its open position. In the extended position, preferably each of the two drivers 20, 21 share the common enclosure 30. That is, no baffle or other barrier is provided in the common enclosure 30 to separate the interior space of the enclosure 30 accessible from each of the two drivers 20, 21. However, structures for mounting the two drivers 20, 21 may be included in the enclosure 30. Ports 60, 61 are provided to increase the acoustic response in the lower frequencies. By use of intermediate portion 33, port 61 may be of greater length than otherwise would have been possible. This may be used to further enhance the low frequency response.

35 Preferably, the system 10 is configured to operate on batteries, AC power, solar power or an auxiliary power source, for example, vehicle power source using a car lighter plug. A battery compartment may be incorporated in the intermediate portion 33. In one embodiment, the system 10 contains an input port to receive the input signal from an audio source such as those described above. The system 10 may also include an AM/FM tuner.

Referring to Figure 2C, in further embodiment, the intermediate section 33 has speaker controls and displays that are exposed when the enclosure 30 is fully extended and protected by the outer section 31 when the enclosure is fully retracted for transport. The speaker controls may include, for example, volume, tone, balance, power on/off, AM/FM tuner control(s) and playback control(s).

Although it has been described that the orientation of the drivers 20, 21 are such that their primary sound generation direction is substantially perpendicular to the longitudinal axis, other possible orientations are envisaged. For example, the drivers 20, 21 may be oriented with their primary axes directed within a variation range from perpendicular wherein the channel separation provided by the enclosure 30 may be appreciated. That is, even with the drivers 20, 21 oriented off of the perpendicular direction, their sound generation may be appreciated by a listener as being generally directed towards the listener. For example, in one embodiment, the drivers 20, 21 may be configured such that the primary axes of each may be directed in a direction falling in the range from precisely perpendicular to about 45 degrees from perpendicular (either outward or inward, i.e., the primary axes intersecting in front of the drivers 20, 21). More preferably, the range is limited to about 30 degrees or less from perpendicular.

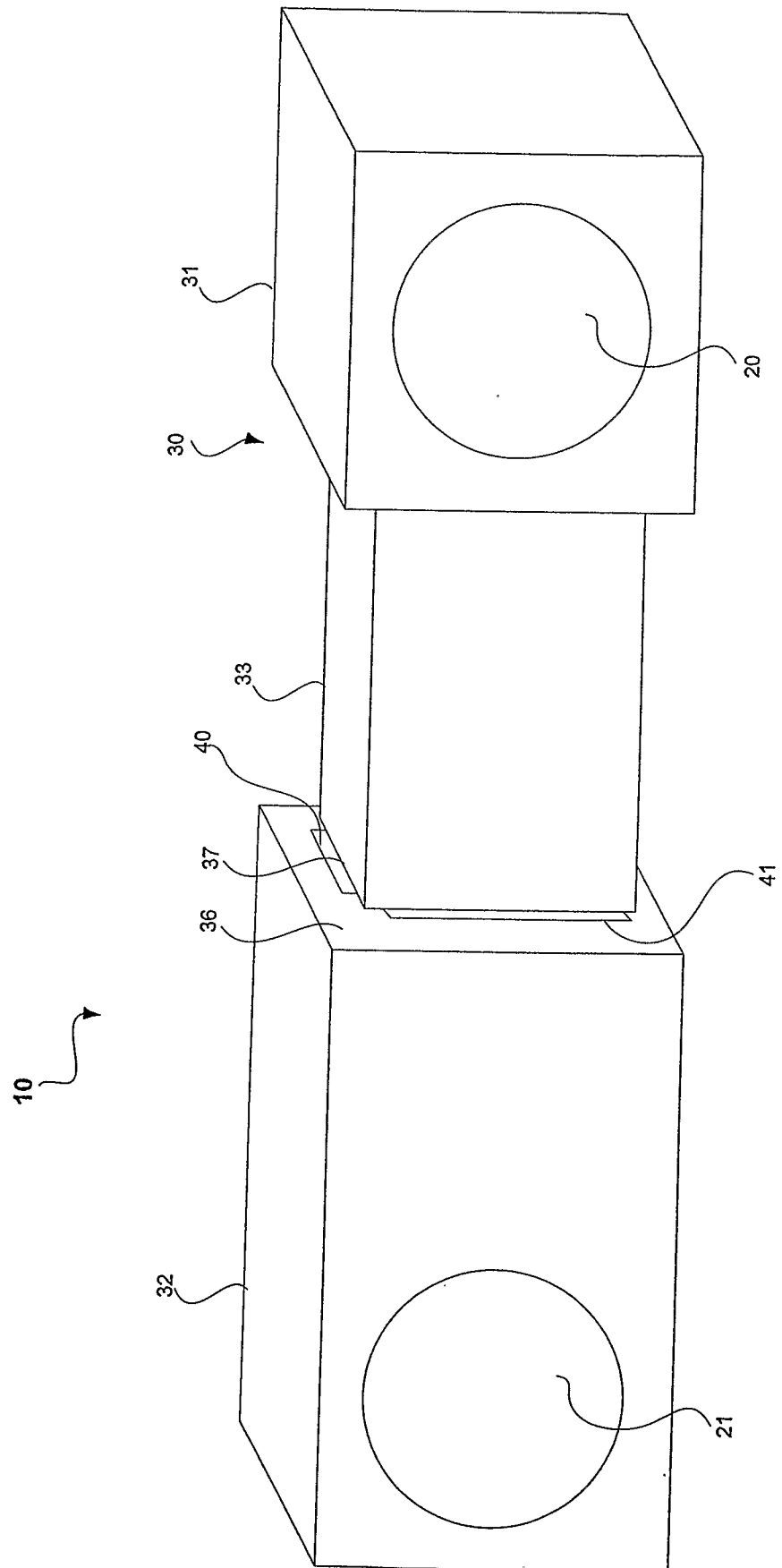
It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the scope or spirit of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects illustrative and not restrictive.

THE CLAIMS:

1. A portable speaker assembly comprising:
 - (a) a first and second driver;
 - 5 (b) a telescoping enclosure movable between a first position and a second position, the telescoping enclosure comprising a first portion, an intermediate portion extending outwardly from the first portion and having a telescopically nesting engagement with a second portion, the intermediate portion being able to move telescopically relative to the second portion along a longitudinal
10 axis of the enclosure,
 - (c) the first driver being coupled to the first portion and the second driver being coupled to the second portion; and
 - (d) the second portion having at least one predetermined void adjacent to the telescopic connection of the intermediate portion with the second
15 portion.
2. The assembly according to claim 1, wherein the at least one predetermined void is substantially filled with an air permeable foam material.
- 20 4. The assembly according to claim 1, wherein the first and second drivers are oriented such that their primary sound generation direction is substantially perpendicular to the longitudinal axis.
5. The assembly according to claim 1, wherein controls are provided on the
25 intermediate section, the controls being at least one selected from the group consisting of: volume, tone, power on/off and playback control.
6. The assembly according to claim 1, wherein the second portion has a port for improving the frequency response of the second portion.
30
7. The assembly according to claim 1, wherein the intermediate portion has a further port for improving the frequency response of the first portion.
8. The assembly according to claim 1, wherein the second portion has an
35 opening in a side wall through which the intermediate portion passes, the at least one predetermined void being on the periphery of the opening.

9. The assembly of claim 1, wherein the intermediate portion is substantially hollow and is acoustically connected to the first portion and the second portion.
10. The assembly as claimed in claim 8, wherein the opening area is greater than the intermediate portion cross-sectional area in a plane transverse to the longitudinal axis.
11. The assembly as claimed in claim 10, wherein the opening area is greater than the intermediate cross-sectional area by the at least one void.
12. The assembly as claimed in claim 1, wherein the location, size, shape and number of the at least one void is controlled to minimize the effect on the telescoping enclosure acoustic response of the at least one void.
13. The assembly as claimed in claim 1, wherein the location, size, shape and number of the at least one void is controlled to enhance the telescoping enclosure acoustic response.
14. The assembly as claimed in claim 1, wherein there is no seal between the intermediate portion and the second portion.
15. The assembly as claimed in claim 14, wherein the at least one void is for reducing friction and rubbing between the second portion and the intermediate portion when the enclosure is extended or retracted.
16. The assembly as claimed in claim 9, wherein the substantially hollow intermediate portion includes a battery compartment.
17. The assembly as claimed in claim 1, further including an AM/FM tuner.
18. A method for providing a balanced sound for substantially the full frequency range by allowing the communication of air between an interior of an enclosure and ambient surroundings.
19. The method as claimed in claim 18, wherein the air is passed through air permeable foam material.

Figure 1



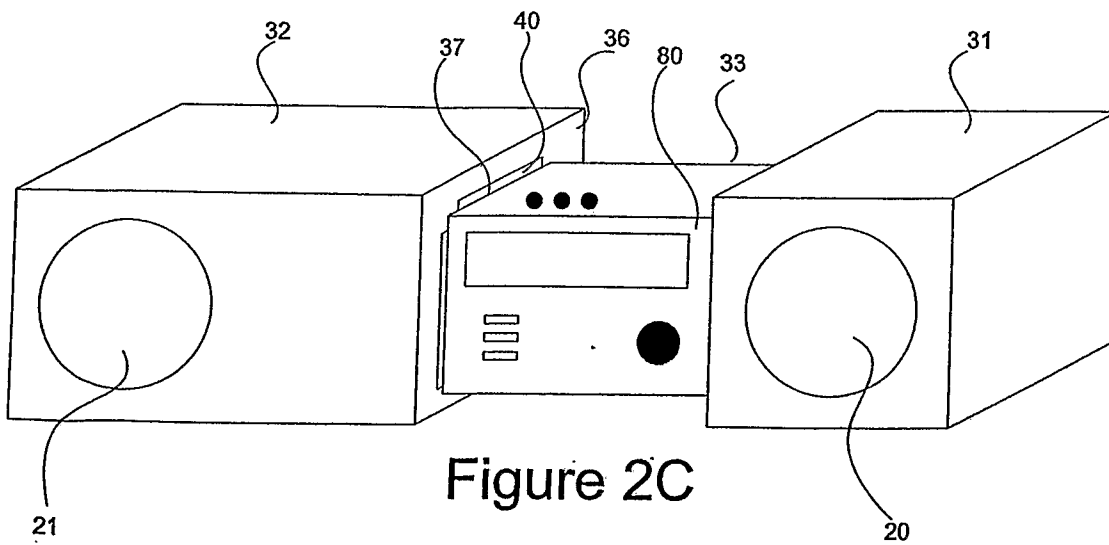
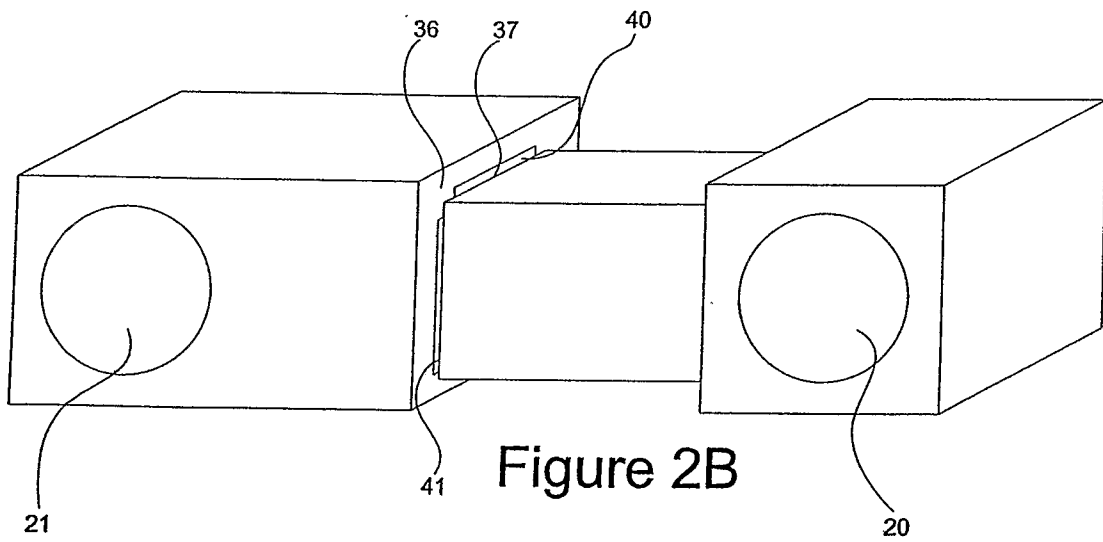
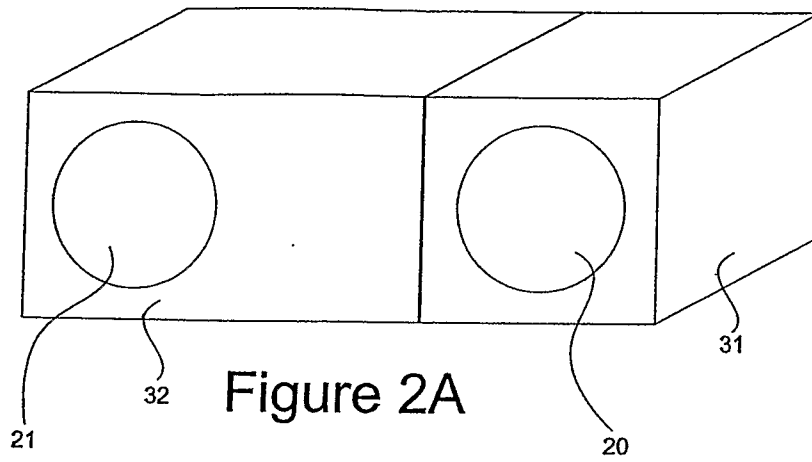
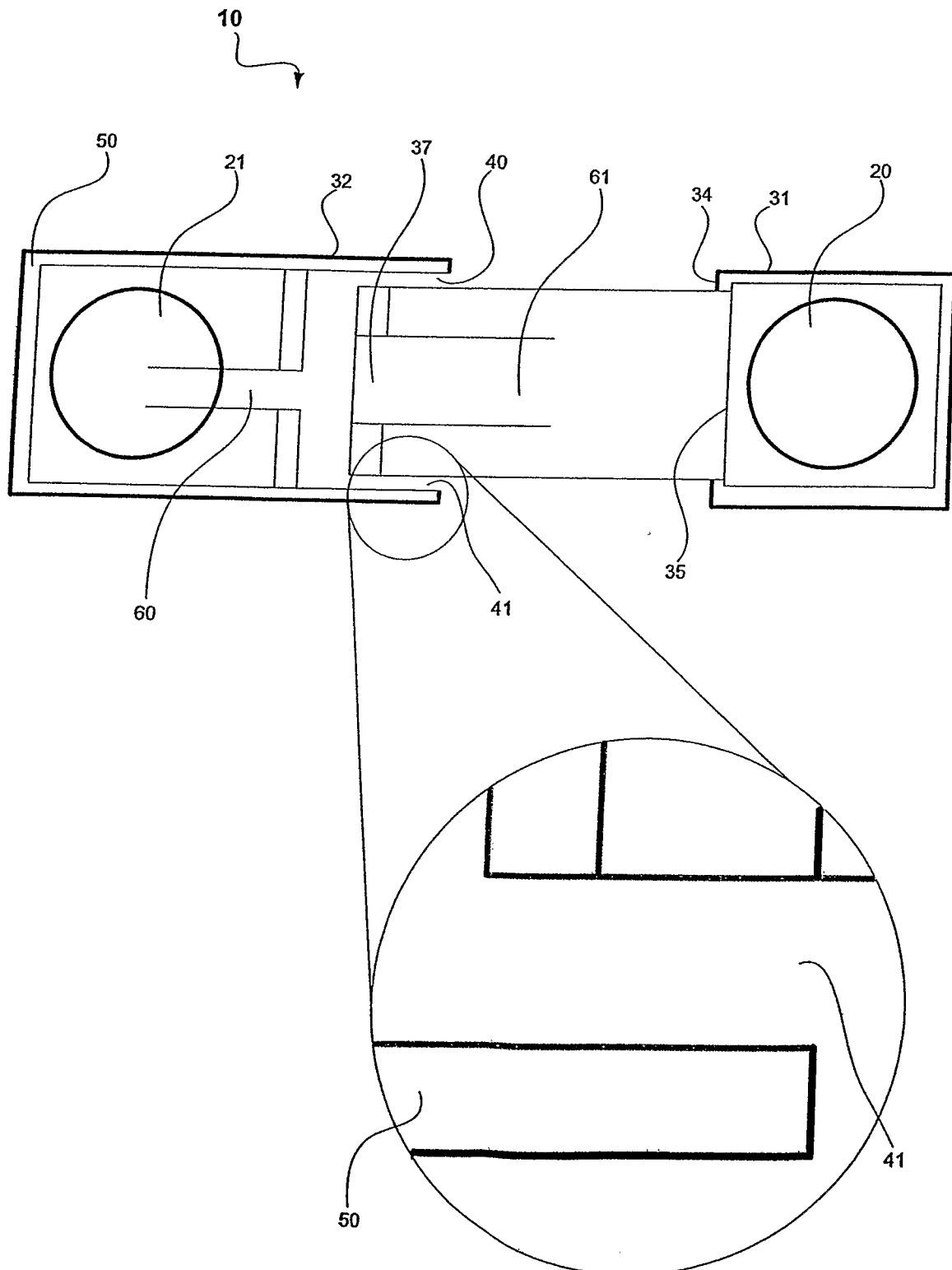


Figure 3



INTERNATIONAL SEARCH REPORT

International application No.

PCT/SG2006/000210

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. Claims 1-17: A portable speaker assembly.
2. Claims 18-19: A method for providing balanced sound.

as reasoned on the extra sheet:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-17

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SG2006/000210

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.

H04R 1/24 (2006.01) H04R 5/00 (2006.01) H04R 9/06 (2006.01)
H04R 1/40 (2006.01) H04R 5/02 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPAT & Google: Keywords: (portable, speaker, driver, telescoping and like terms)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/0031148 A1 (McNARY) 10 February 2005. See for example the abstract and fig 1-6B.	1-17
X	US 5450495 (GOLDFARB) 12 September 1995. See for example the abstract and fig 3-5.	1-17

☐

Further documents are listed in the continuation of Box C

☒

See patent family annex

* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
09 October 2006/09 October 2006

Date of mailing of the international search report
16 OCT 2006

Name and mailing address of the ISA/AU
AUSTRALIAN PATENT OFFICE
PO BOX 200, WODEN ACT 2606, AUSTRALIA
E-mail address: pct@ipaustalia.gov.au
Facsimile No. (02) 6285 3929

Authorized officer

DALE E. SIVER
Telephone No : (02) 6283 2196

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SG2006/000210

Supplemental Box

(To be used when the space in any of Boxes I to VIII is not sufficient)

Continuation of Box No: III

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

In assessing whether there is more than one invention claimed, I have given consideration to those features which can be considered to potentially distinguish the claimed combination of features from the prior art. Where different claims have different distinguishing features they define different inventions.

This International Searching Authority has found that there are two different inventions as follows:

- Claims 1-17 is directed to "a portable speaker assembly comprising a first and second driver and an enclosure with a first and second portion." It is considered that "the telescoping nature of the enclosure being movable between a first position and a second position with the first driver coupled to the first portion and the second driver coupled to the second portion" comprises a first distinguishing feature.
- Claims 18-19 is directed to "a method for providing balanced sound for full frequency range." It is considered that "the allowance of communication of air to ambient surroundings" comprises a second distinguishing feature.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

Each of the abovementioned groups of claims has a different distinguishing feature and they do not share any feature which could satisfy the requirement for being a special technical feature. Because there is no common special technical feature it follows that there is no technical relationship between the identified inventions. Therefore the claims do not satisfy the requirement of unity of invention a priori.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SG2006/000210

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member			
US	2005031148				
US	5450495	AU	55307/96	BR	9608450
		CN	1183882	EP	0827677
		WO	9631083	CA	2216829
				US	5664020
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.					
END OF ANNEX					