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(71) Applicant: **TGI TECHNOLOGY PTE LTD** [SG/SG]; 62 Marine Parade Road, #09-05 Cote D'Azur, Singapore 449298 (SG).

(72) Inventor: **SHIHUANG, Li**; 62 Marine Parade Road, #09-05 Cote D'Azur, Singapore 449298 (SG).

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(54) Title: A TYPE OF SPEAKER CABINET, AND AN EXTRUSION BLOW MOULD AND MANUFACTURING METHOD FOR A SPEAKER CABINET

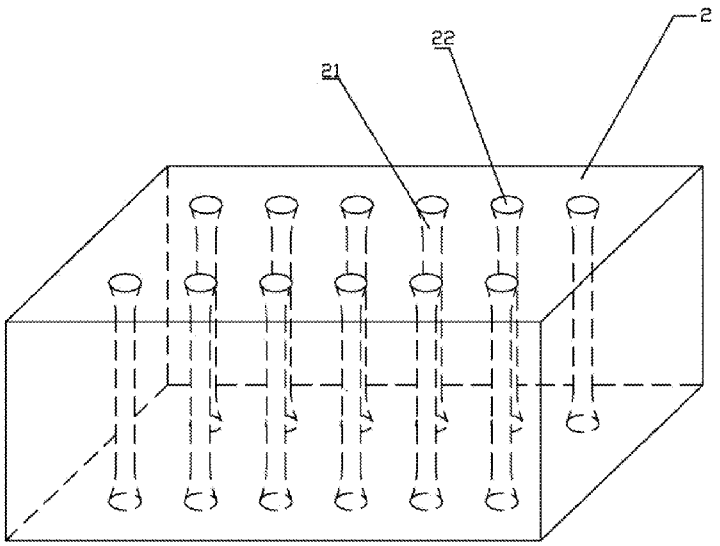


Figure 1

(57) Abstract: This invention provides a speaker cabinet, and the aforementioned speaker cabinet includes a containment space within; multiple reinforcing rib connectors pass through the space between the two faces on the inside of the aforementioned containment space with the largest area; when these two faces start moving towards or away from each other, the reinforcing rib connectors provide resistance in the opposite direction of the movement; the aforementioned cabinet and reinforcing rib connectors are created in one piece via extrusion blow moulding. The invention provides a speaker cabinet, where the total capacity of the cabinet can remain unchanged during use, and the cabinet is very light-weight, and the inner walls of the cavity are also very thin. Completely fulfils sound quality and portability requirements.

[Continued on next page]

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Published:

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Description

A type of speaker cabinet, and an extrusion blow mould and manufacturing method for a speaker cabinet

Technical Field of the Invention

[0001] The invention involves a speaker cabinet.

Prior Art

[0002] Traditionally, the weight of the speaker cabinet was intimately linked to speaker sound quality, as the larger the speaker unit of the speaker cabinet, the greater the power required to cause the speaker unit to vibrate. And the larger the speaker unit, the more sonic pressure is created in the speaker cabinet after it vibrates. The more sonic pressure created, the more likely it is that the area within the speaker cabinet will warp, becoming larger or smaller, according to the vibration. To stabilise the capacity of the speaker cabinet, the speaker cabinet walls need to be made thicker, and the materials used to produce the speaker cabinet must be fairly rigid as well. These all increased speaker cabinet quality. Meaning that it a light speaker cabinet was an oxymoron where good sound quality was concerned, and the two properties could not exist together.

Description of the Invention

[0003] The main technical problem the invention seeks to solve is the provision of a speaker cabinet, where the capacity of the speaker cabinet can remain unchanged during use, but the speaker cabinet is also light-weight, with thin walls. The invention completely fulfils sound quality and portability requirements.

Description

[0004] In order to solve the aforementioned problem, the invention provides a speaker cabinet, and the aforementioned speaker cabinet includes a containment space within; multiple reinforcing rib connectors pass through the space between the two faces on the inside of the aforementioned containment space with the largest area; when these two faces start moving towards or away from each other, the reinforcing rib connectors provide resistance in the opposite direction of the movement;

[0005] The aforementioned cabinet and reinforcing rib connectors are created in one piece via extrusion mould extrusion blow moulding.

[0006] In an optimal example: the aforementioned reinforcing rib connectors are hollow shafts, and the aforementioned two faces each have apertures connecting through to the hollow shafts; and each of the aforementioned apertures are set in positions corresponding to each of the hollow shafts.

[0007] In an optimal example: the aforementioned reinforcing ribs are parallel to each other.

[0008] In an optimal example: the aforementioned cabinet is rectangular, and the aforementioned reinforcing rib connectors pass between its top and bottom faces.

[0009] The invention also provides an extrusion blow mould for producing the aforementioned speaker cabinet, which is comprised of two moulds provided symmetrically, with one side of the aforementioned two moulds being the opening face; multiple shafts extending from the face within each mould furthest from the opening face towards the direction closest to the opening face; with the aforementioned shafts being lower than the flat surface existing on the aforementioned opening face;

[0010] And when the two moulds are fitted together, there is a fixed distance between the shaft ends of the two moulds.

Description

[0011] In an optimal example: the aforementioned mould is rectangular.

[0012] This invention also provides a method of using the aforementioned extrusion blow mould to produce a speaker cabinet, where the parison required for the extrusion blow moulding is placed between the two moulds along the lengthwise direction, and the two ends of the parison are cut off when the mould is closed, keeping it between the two moulds;

[0013] Blowing commencing into the blow port of the closed two moulds, causing the parison within the mould to expand; and during the expansion process the parison covers the inner walls of the mould and the outer walls of the shafts, forming the speaker cabinet.

[0014] The invention offers the following advantages over conventional technology:

[0015] 1. The invention provides a type of speaker where the entire body of the speaker is formed in one piece via an extrusion blow moulding process, with relatively high surface tension. The speaker is quite resistant to pressure while in operation, and thus, its shape is difficult to warp. In addition, reinforcing rib connectors pass between the two faces of the speaker cabinet with the largest area and act on both, further increasing the pressure-resistant capabilities of the speaker cabinet. This enables the speaker cabinet to be light and thin, while also fulfilling the demands of a speaker cabinet to provide good sound quality.

[0016] 2. The invention provides a type of speaker cabinet, where the elongated speaker cabinets can be created easily via and extrusion blow moulding process. In addition, the mould required for the extrusion blow moulding is fairly inexpensive, representing a large cost saving over traditional injection moulds. This means that the same soundbar can be placed in speaker cabinets of different lengths, allowing users to

Description

select speaker cabinets which match the length of their home television sets, making the speaker and television will be more compatible, and increasing overall integration.

[0017] 3.The invention provides a type of speaker cabinet which uses reinforcing ribs to produce the cabinet of the speaker cabinet, making the capacity of the speaker cabinet very stable. The speaker cabinet can therefore take various different forms, and is not subject to the restrictions of being a pressure container. This makes it possible to make a wide variety of individual speakers via an extrusion blow moulding process.

[0018] 4. The invention provides a type of speaker cabinet. As many hollow shafts naturally exist within the speaker cabinet, these shafts to provide inverted tube speakers or labyrinth speakers.

Description of the Drawings

[0019] Fig. 1 is a structural diagram showing the speaker cabinet structure described in Optimal Example 1 of the invention;

[0020] Fig. 2 is a structural diagram showing the extrusion blow mould of Optimal Example 1 of the invention;

[0021] Fig. 3 is a schematic diagram showing the closed extrusion blow mould of Optimal Example 1 of the invention;

[0022] Fig. 4 is a structural diagram showing the speaker cabinet of Optimal Example 2 of the invention.

Detailed Description

[0023] The technical solutions of the invention will be further described below with reference to the attached drawings.

Description

[0024] Fig. 1-3 shows an extrusion blow mould for producing a speaker cabinet, which is comprised of two moulds (1) provided symmetrically, with one side of the aforementioned two moulds (1) being the opening face; multiple shafts (11) extending from the face within each mould (1) furthest from the opening face towards the direction closest to the opening face; with the aforementioned shafts (11) being lower than the flat surface existing on the aforementioned opening face;

[0025] Therefore, when the two moulds (1) are fitted together, there is a fixed distance between the shaft (11) ends of the two moulds (1). The mould in the optimal example is rectangular, but this is only for illustrative purposes, and this can be exchanged for a mould of any other shape in practical application, as a simple exchange belonging to the example.

[0026] In the method of producing a speaker cabinet using the aforementioned extrusion blow moulds, the parison required for the extrusion blow moulding is placed between the two moulds (1) along the lengthwise direction, and the two ends of the parison are cut off when the mould (1) is closed, keeping it between the two moulds (1);

[0027] Blowing commences into the blow port of the closed two moulds (1), causing the parison within the mould (1) to expand; and during the expansion process the parison will flow through the lengthwise gaps between the shaft (11) ends, causing the parison to cover the inner walls of the mould (1) and outer walls of the shafts (11), forming the speaker cabinet (2).

[0028] The speaker cabinet (2) is formed, and includes a containment space within, where multiple reinforcing rib connectors (21) pass through the space between the two faces on the inside of the aforementioned containment space with the largest area; and when these two faces start moving towards or away from each other, the reinforcing

Description

rib connectors (21) provide resistance in the opposite direction of the movement;

[0029] The aforementioned reinforcing rib connectors (21) are hollow shafts, and the aforementioned two faces each have apertures (22) connecting through to the hollow shafts; each of the aforementioned apertures (22) are set in positions corresponding to each of the hollow shafts (21), and the aforementioned reinforcing ribs (21) are parallel to each other.

[0030] The aforementioned speaker cabinet is formed in one piece via extrusion blow moulding, has a relatively high surface tension, and has good pressure-resistant capabilities during operation, making it difficult to warp. In addition, reinforcing rib connectors pass between the two faces of the speaker cabinet with the largest area and act on both, further increasing the pressure-resistant capabilities of the speaker cabinet. This enables the speaker cabinet to be light and thin, while also fulfilling the demands of a speaker cabinet to provide good sound quality. Example 2

[0031] Fig. 4 shows that in this example, the reinforcing ribs are no longer hollow and cylindrical shafts, and that they are now flat and hollow shafts. This shape also achieves the action of the reinforcing ribs, and as the rest of the design is the same as that of Example 1, no further explanation will be provided.

[0032] Everything described above is only a preferred example of the invention, but the scope of the invention is not limited to this. Anyone familiar with these technologies can easily think of changes or substitutions which would fall under the scope of the technology disclosed by the invention, such as using a different type of blow moulding, and any such changes or substitutions would all be within the scope of protection given to the invention. Therefore, the scope of protection of the invention should be as the Scope of Claims.

Claims

1. A type of speaker cabinet, characterised by: the aforementioned speaker cabinet including a containment space within, with multiple reinforcing rib connectors passing through the space between the two faces on the inside of the aforementioned containment space with the largest area; and when these two faces start moving towards or away from each other, the reinforcing rib connectors provide resistance in the opposite direction of the movement; where the aforementioned cabinet and reinforcing rib connectors are created in one piece via extrusion blow moulding.

2. The speaker cabinet described in Claim 1, characterised by: the aforementioned reinforcing rib connectors being hollow shafts, with the aforementioned two faces each having apertures connecting through to the hollow shafts; and each of the aforementioned apertures being set in positions corresponding to each of the hollow shafts.

3. The speaker cabinet described in Claim 1, characterised by: the aforementioned reinforcing rib connectors being hollow and flat shafts, with the aforementioned two faces each having apertures connecting through to the hollow and flat shafts; and each of the aforementioned apertures being set in positions corresponding to each of the hollow and flat shafts.

4. The speaker cabinet described in Claim 1, characterised by: the aforementioned reinforcing rib connectors being parallel to each other.

5. The speaker cabinet described in Claim 1, characterised by: the aforementioned cabinet being rectangular; with the aforementioned reinforcing rib connectors passing between its top and bottom faces.

6. An extrusion blow mould for producing any of the speaker cabinets described in Claims 1-5, characterised by: being comprised of two moulds provided symmetrically, with one side of the aforementioned two moulds being the opening face; multiple shafts

Claims

extending from the face within each mould furthest from the opening face towards the direction closest to the opening face; with the aforementioned shafts being lower than the flat surface existing on the aforementioned opening face; and when the two moulds are fitted together, there is a fixed distance between the shaft ends of the two moulds.

7. The aforementioned extrusion blow mould for a speaker cabinet described in Claim 6, characterised by: the aforementioned mould being rectangular.

8. A method of using the aforementioned extrusion blow mould described in any of Claims 5 or 6 or 7 to produce a speaker cabinet, characterised by: the parison required for the extrusion blow moulding being placed between the two moulds along the lengthwise direction, with the two ends of the parison being cut off when the mould is closed, keeping it between the two moulds; blowing commencing into the blow port of the closed two moulds, causing the parison within the mould to expand; and during the expansion process the parison covers the inner walls of the mould and the outer walls of the shafts, forming the speaker cabinet.

Drawings

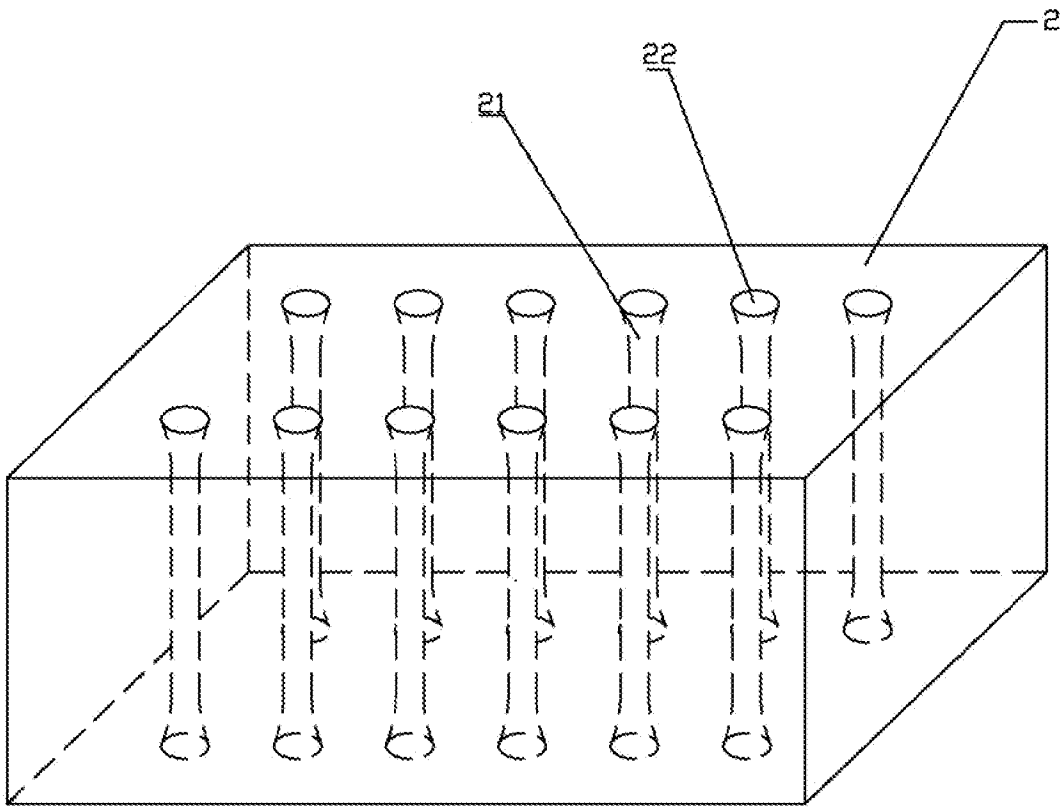


Figure 1

Drawings

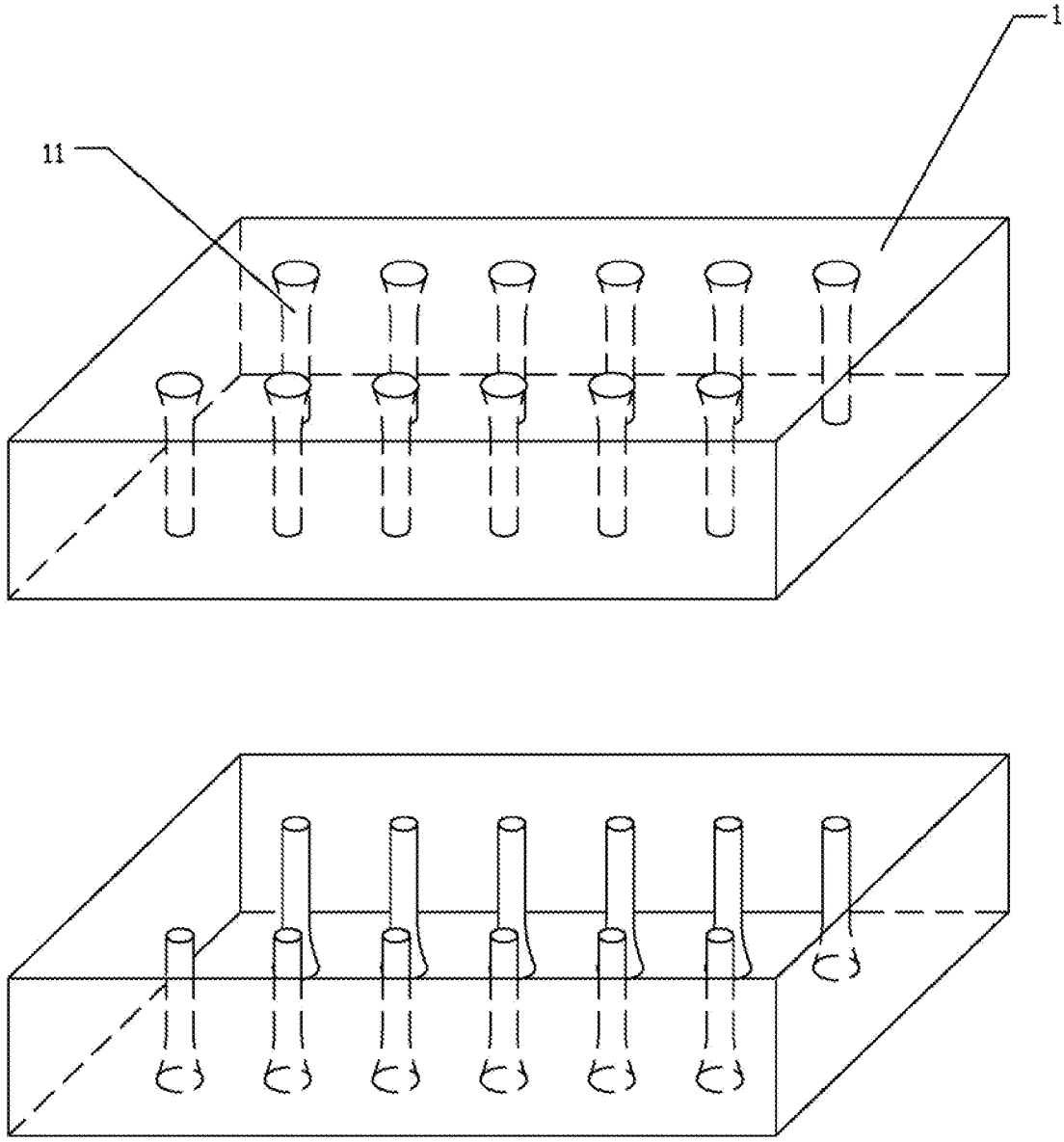


Figure 2

Drawings

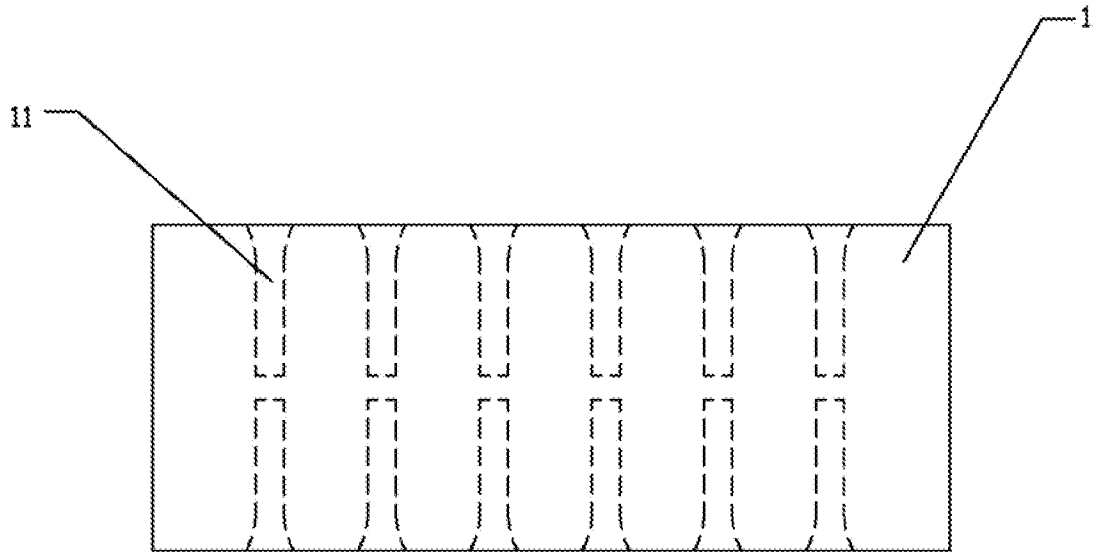


Figure 3

Drawings

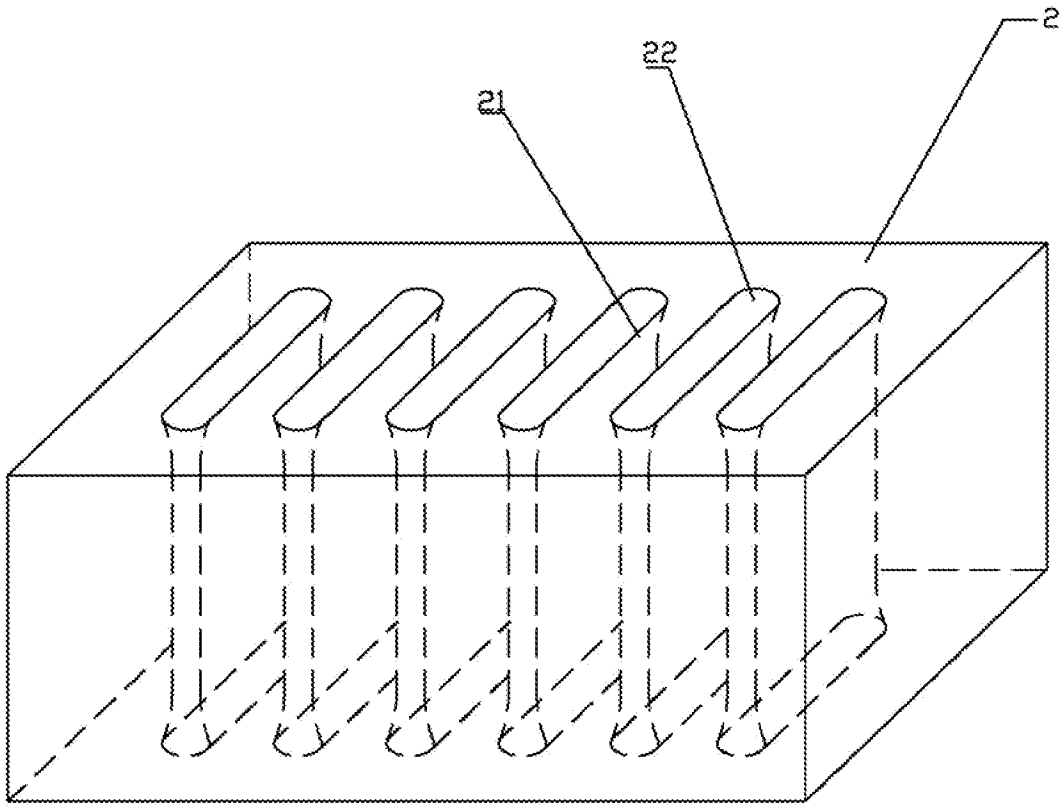


Figure 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SG2018/050413

A. CLASSIFICATION OF SUBJECT MATTER

H04R 1/02(2006.01)i, H04R 31/00(2006.01)i

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)
H04R 1/02; A47B 81/00; A47B 81/06; H04R 1/20; H04R 1/28; H04R 31/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: speaker, cabinet, mould, extrusion, parison, blow, connector, rib

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2015-0319523 A1 (PANASONIC INTELLECTUAL PROPERTY MANAGEMENT CO., LTD.) 05 November 2015 See paragraphs [0139]-[0145] and figures 5A-5B.	1-8
Y	US 2005-0140255 A1 (SIMON WILSON) 30 June 2005 See paragraphs [0048]-[0073] and figures 1-4.	1-8
Y	US 2005-0169494 A1 (ENRIQUE M. STILES et al.) 04 August 2005 See paragraph [0024] and figure 2.	2-3
A	JP 2006-287310 A (ONKYO CORP.) 19 October 2006 See paragraphs [0021]-[0029] and figures 1-3.	1-8
A	US 2003-0024764 A1 (JOSEPH C. FOX) 06 February 2003 See paragraphs [0025]-[0031] and figures 1-6.	1-8

☐ 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
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"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
"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
"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
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17 December 2018 (17.12.2018)	**17 December 2018 (17.12.2018)**

Name and mailing address of the ISA/KR
International Application Division
Korean Intellectual Property Office
189 Cheongsa-ro, Seo-gu, Daejeon, 35208, Republic of Korea
Facsimile No. +82-42-481-8578

Authorized officer
KIM, Sung Gon
Telephone No. +82-42-481-8746

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/SG2018/050413

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