(54) Title: VEHICLE ACCESSORY MICROPHONE

(57) Abstract: A microphone assembly (208) includes one or more transducers positioned in one or more housings. A processing circuit is coupled to the transducer for outputting an electrical signal such that the microphone in combination with the processing circuit very effectively cancels noise. The microphone assembly (208) can be employed in a vehicle accessory (101).
Publishing:
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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.
### INTERNATIONAL SEARCH REPORT

**A. CLASSIFICATION OF SUBJECT MATTER**

<table>
<thead>
<tr>
<th>IPC(7)</th>
<th>US CL</th>
</tr>
</thead>
<tbody>
<tr>
<td>H04R 1/02</td>
<td>381/91, 92</td>
</tr>
</tbody>
</table>

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)

- U.S. : 381/91, 92

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)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category #</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>US 5,335,282 A (CARDAS) 02 August 1994, col. 4, lines 29-55.</td>
<td>14, 26, 27-28 and 30</td>
</tr>
</tbody>
</table>

- See patent family annex.

- Further documents are listed in the continuation of Box C.

- Special categories of cited documents:
  
  "A" document defining the general state of the art which is not considered to be of particular relevance

  "E" earlier application or patent published on or after the international filing date

  "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another invention or other special reason (as specified)

  "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

  "R" 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

  "S" 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, each consideration being obvious to a person skilled in the art

  "A" document member of the same patent family

- Date of the actual completion of the international search: 24 June 2002 (24.06.2002)

- Date of mailing of the international search report: 14 APR 2003

- Name and mailing address of the ISA/US Commission of Patents and Trademarks
  Box PCT
  Washington, D.C. 20331
  Facsimile No. (703)305-3230

- Authorized officer: [Signature]

- Telephone No. (703) 305-4764

Form PCT/ISA/210 (second sheet) (July 1998)
INTERNATIONAL SEARCH REPORT

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

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

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

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

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation 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 an additional fee, this Authority did not invite payment of any additional fee.

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.: 1-47, and 52-55.

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.:

Remark on Protest □ The additional search fees were accompanied by the applicant’s protest.
□ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet(1)) (July 1998)
BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-5, drawn to a microphone system with a 1st and 2nd transducers, a remote processing circuit, a microphone interface circuit with a 1st and 2nd electrical signal paths with an phase inverter circuit.

Group II, claim(s) 6-10, drawn to a vehicle accessory with a housing attached to the vehicle containing a microphone assembly including with a 1st and 2nd transducers, a remote processing circuit, a microphone interface circuit with a 1st and 2nd electrical signal paths with an phase inverter circuit.

Group III, claim(s) 11-14, drawn to a vehicle accessory with a housing attached to the vehicle containing a microphone assembly including with a one transducer, a remote processing circuit, a microphone interface circuit with a 1st and 2nd electrical signal paths, and an impedance matching circuit.

Group IV, claim(s) 15-26, drawn to a vehicle accessory with a housing attached to the vehicle containing a microphone assembly having a microphone housing having a plurality of ports and windscreen, and 1st and 2nd transducers generating respective polar patterns.

Group V, claim(s) 27-30, drawn to a vehicle accessory with a housing attached to the vehicle containing a microphone assembly including with a one transducer, and high frequency boost circuit.

Group VI, claim(s) 31-47, drawn to a vehicle accessory with a housing attached to the vehicle containing a 1st and 2nd microphone assembly spaced apart from each other.

Group VII, claim(s) 48-51, drawn to a vehicle accessory with a housing attached to the vehicle containing a microphone assembly with a windscreen and deflector for deflecting the airflow away from the microphone assembly.

Group VIII, claim(s) 52-55, drawn to a vehicle accessory with a housing attached to the vehicle containing a 1st and 2nd transducer spaced apart from each other and a separator disposed between the transducers for deflecting the airflow from the two transducers.

Group IX, claim(s) 56-59, drawn to a rearview mirror for a vehicle assembly, including a mirror housing, with a mirror positioned therein, a 1st microphone housing having two transducers (1st and 2nd), a 2nd microphone housing having two transducers (3rd and 4th), with specific positioning.

The inventions listed as Groups I-VIII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: each group is specifically claimed a different structure with specific components to perform different functions. Group I and II are similar in structure, however, Group II is claimed in a specific environment such as a vehicle wherein, Group I is simply the structure of a microphone unit which may be utilized in various environments. Group III further includes the vehicle accessory with at least one transducer, wherein, but further claims an impedance matching circuit. Group IV claims the vehicle accessory, wherein, comprising the microphone housing with plural ports and windscreen. Group V, claims a vehicle accessory, wherein, with a microphone assembly with a frequency boost circuit. Group VI, claims a vehicle assembly with just structure aspects only with a housing with a two microphone assemblies with specific physical measurements. Group VII, claims a vehicle housing with a microphone assembly with a windscreen and a deflector. Group VIII, claims a vehicle housing with a 1st and 2nd transducers spaced apart with a separator positioned between the transducers. Group IX, claims a rearview mirror assembly for a vehicle with a mirror, two microphone housing, each with two transducers, respectively, and positioned accordingly.