



(12) **United States Patent**  
**DeLine et al.**

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(54) **INTERIOR REARVIEW MIRROR SOUND PROCESSING SYSTEM**

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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This patent is subject to a terminal disclaimer.

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(21) Appl. No.: **09/466,010**

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(22) Filed: **Dec. 17, 1999**

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**Related U.S. Application Data**

(63) Continuation-in-part of application No. 09/449,121, filed on Nov. 24, 1999, and a continuation-in-part of application No. 09/448,700, filed on Nov. 24, 1999, now Pat. No. 6,329,925, and a continuation-in-part of application No. 09/433,467, filed on Nov. 4, 1999, now Pat. No. 6,326,613, and a continuation-in-part of application No. 09/396,179, filed on Sep. 14, 1999, now Pat. No. 6,278,377, which is a continuation-in-part of application No. 09/382,720, filed on Aug. 25, 1999, now Pat. No. 6,243,003.

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(51) **Int. Cl.**<sup>7</sup> ..... **B60Q 1/00; H04R 29/00**  
(52) **U.S. Cl.** ..... **340/815.4; 340/425.5; 381/56; 381/86; 381/169; 381/361; 381/365**  
(58) **Field of Search** ..... **340/315.4, 425.5; 381/71.1, 71.4, 56–58, 86, 91; 379/454, 446; 455/74.1, 569, 566, 567, 575, 90, 99, 100**

**ABSTRACT**

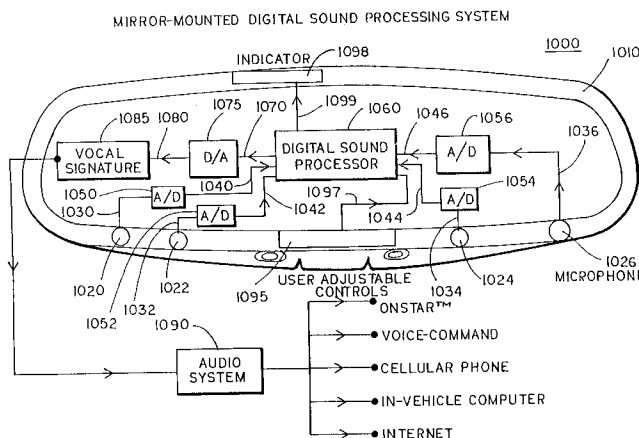
A digital sound processor is provided to enhance the vocal to non-vocal noise ratio of the signal processed by a vehicle audio system such as a cellular telephone, emergency communication device, or other audio device. Optionally, an indicator is provided for use with the vehicular audio system in order to provide a user of the audio system with a status signal relating to a reception quality of a vocal signal from the user. The microphone of the audio system may be mounted within an accessory module, which may be mounted to an interior surface of a vehicle windshield. The accessory module provides a fixed orientation of the microphone and is easily installed to the vehicle as it is manufactured or as an aftermarket device. The indicator may be mounted at the accessory module or elsewhere at the mirror assembly.

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**43 Claims, 10 Drawing Sheets**



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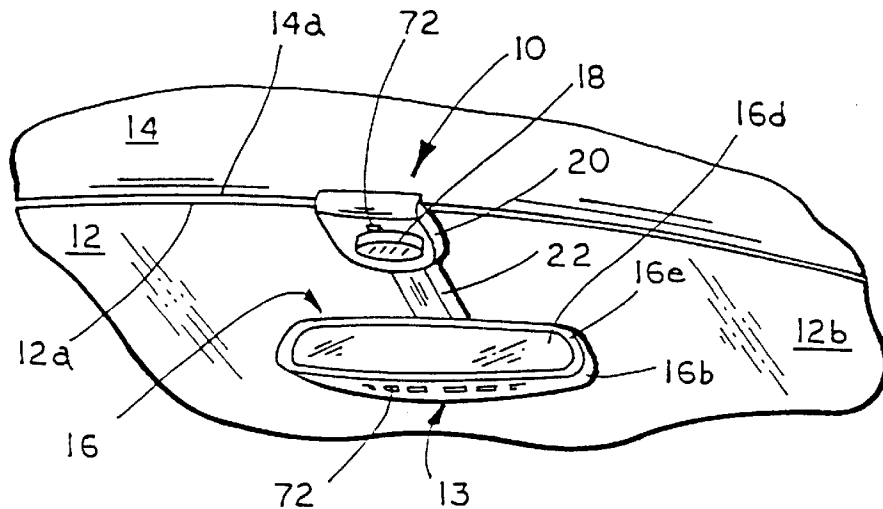


FIG. 1

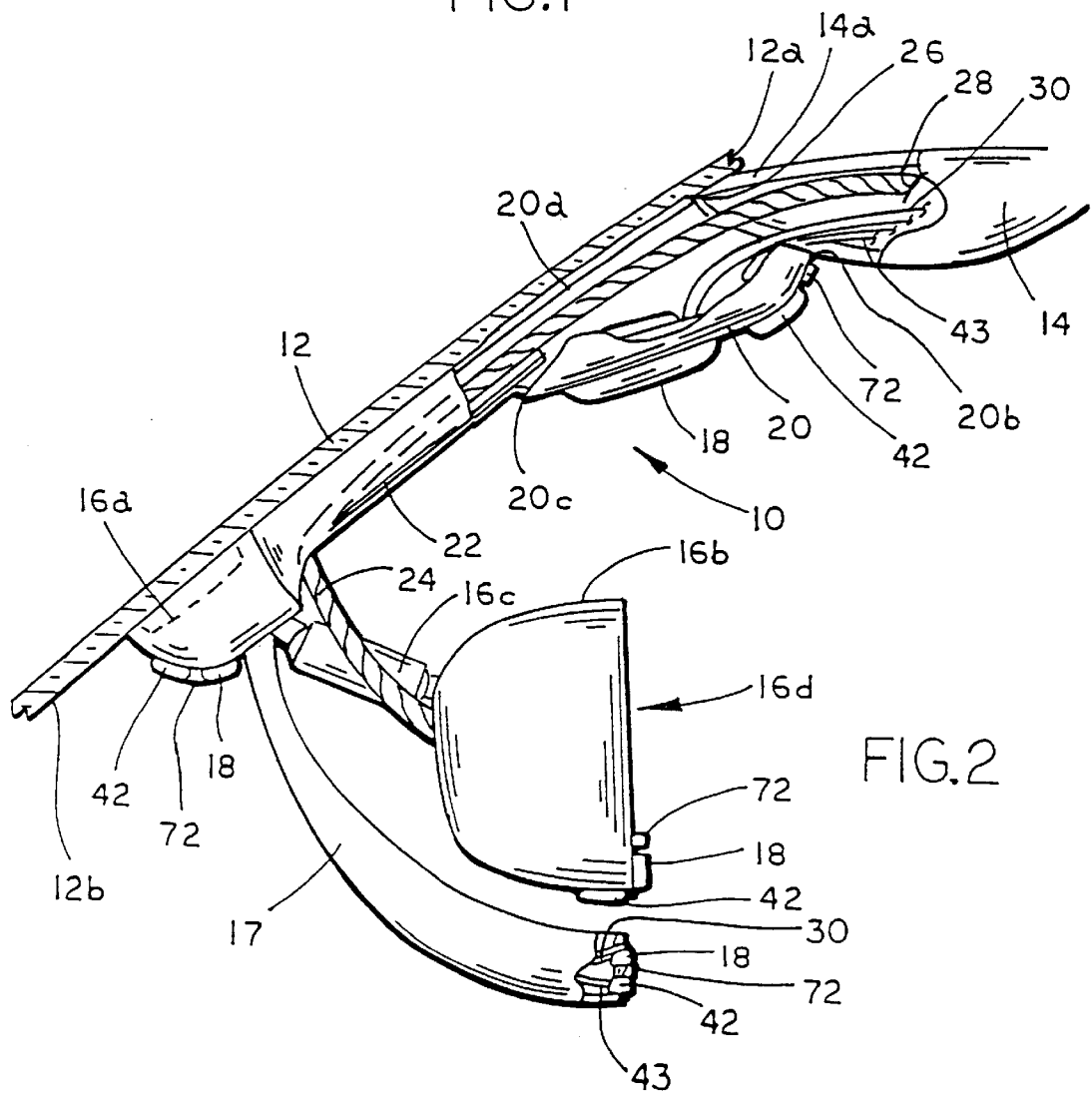
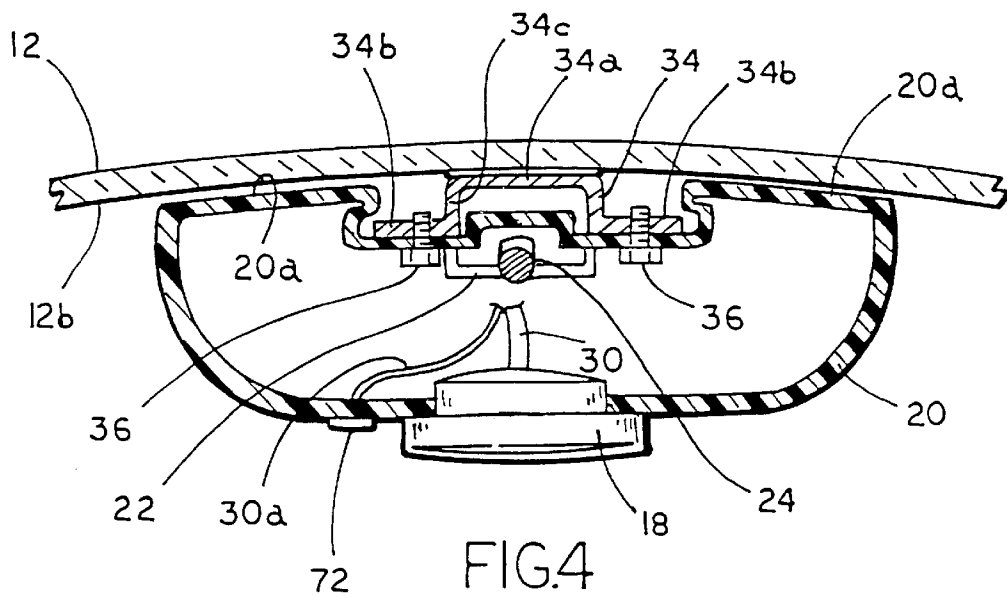
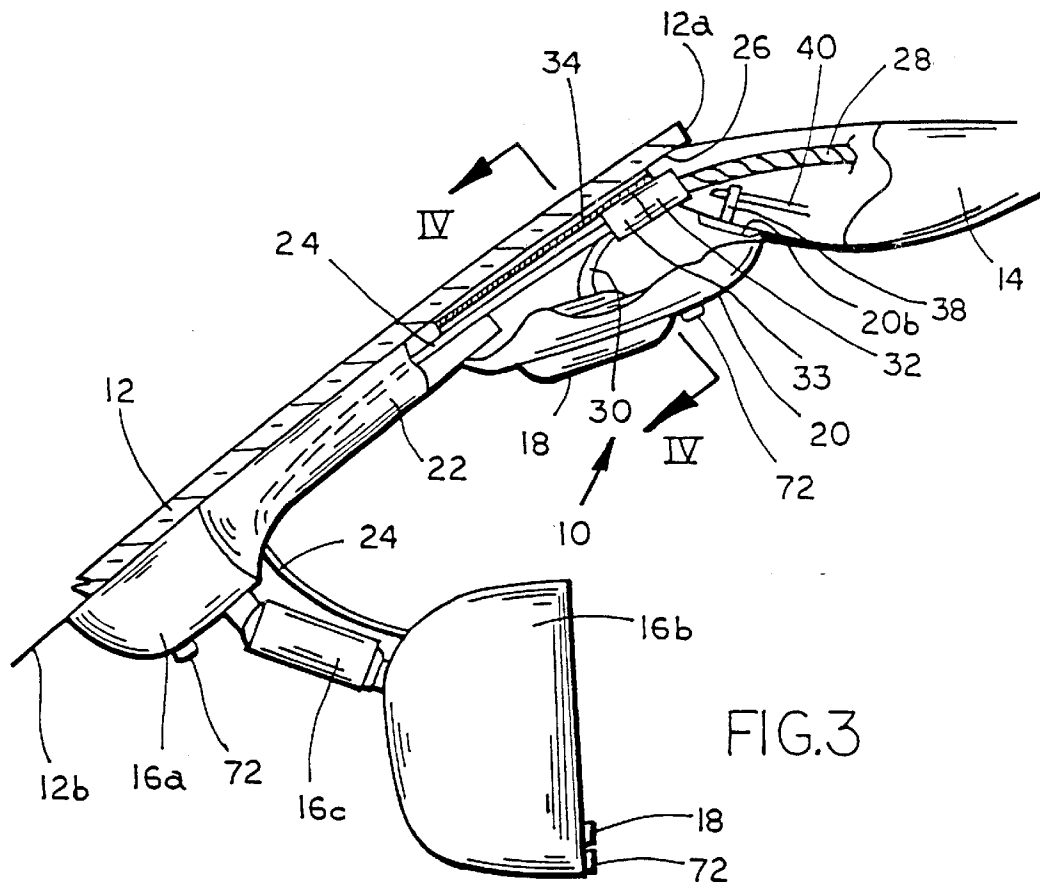


FIG. 2



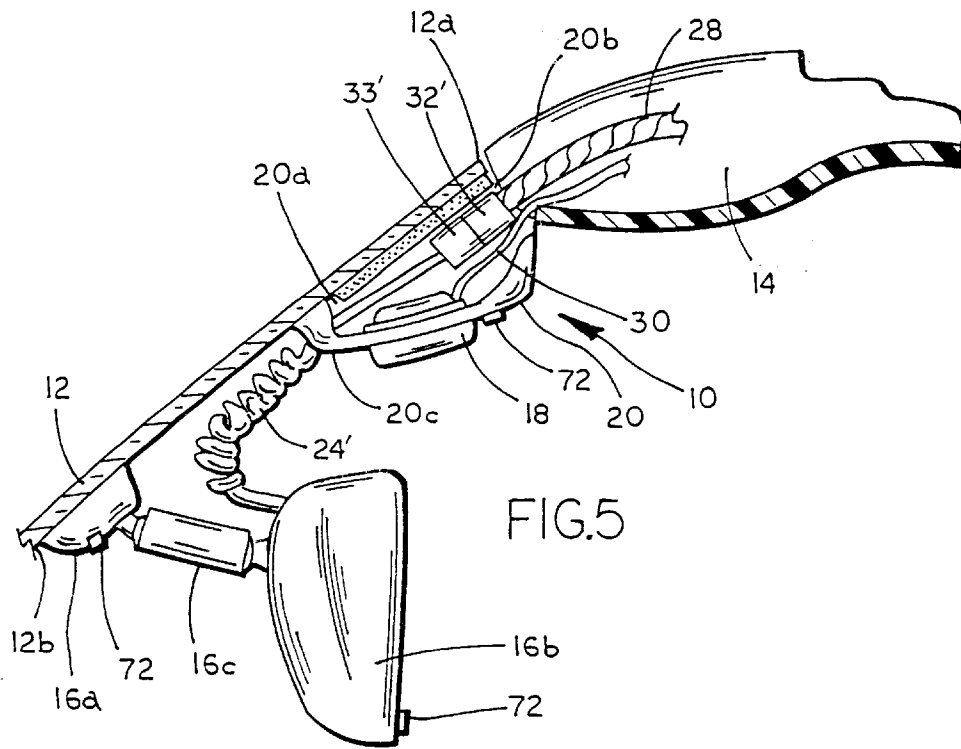


FIG. 5

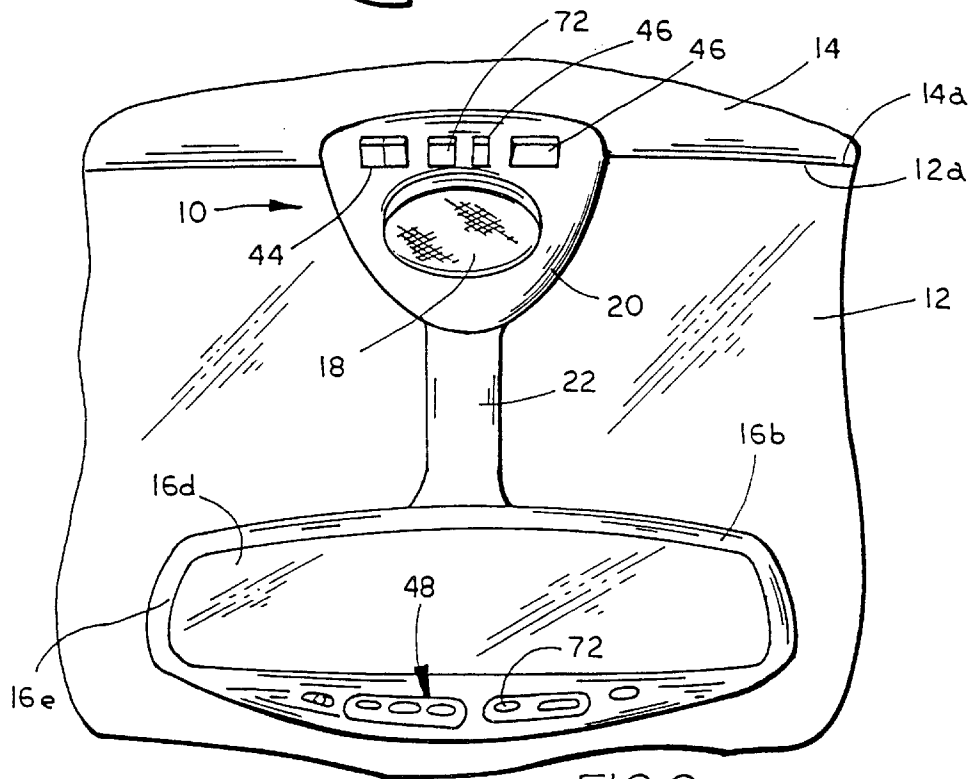


FIG. 6

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