United States Patent [19]

Fu

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[54] **VEHICLE SEAT ASSEMBLY INCLUDING AT LEAST ONE OCCUPANT SENSING SYSTEM AND METHOD OF MAKING SAME**

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[51] **Int. Cl.**[6] **B60K 28/00**
[52] **U.S. Cl.** **180/273**; 280/735; 297/410
[58] **Field of Search** 280/735; 297/410, 297/391; 318/568.1, 567; 180/273

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Primary Examiner—Christopher P. Ellis
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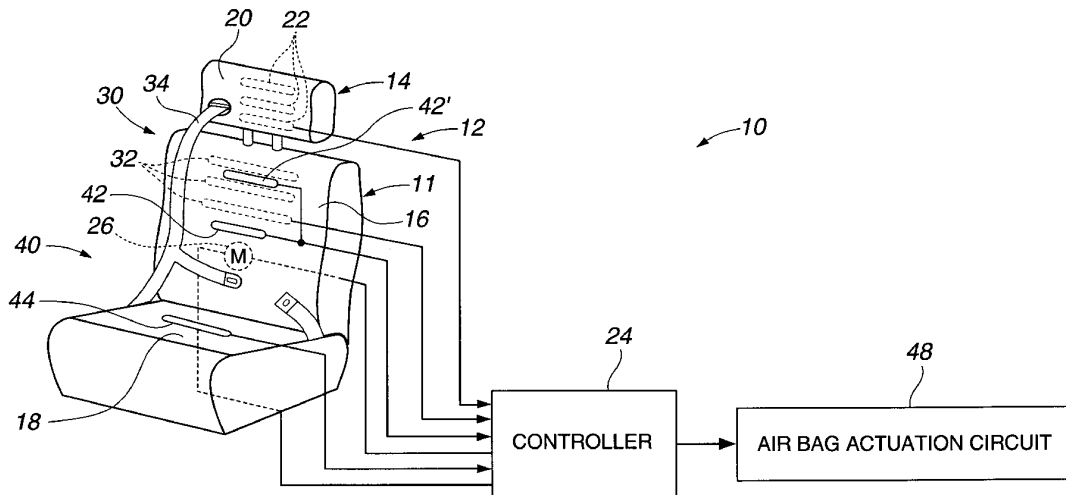
[57] **ABSTRACT**

A vehicle seat assembly comprising occupant sensing systems for use in headrest adjusting and/or air bag actuation systems. One sensing system includes a passive transducer array in the form of pressure transducers such as force sensing resistors vertically spaced in a first embodiment in a headrest cushion of the vehicle seat. In a second embodiment, the pressure transducers are vertically spaced in a backrest cushion of the seat. The pressure transducers generate signals which are processed by a controller to generate a control signal to control a bidirectional headrest motor coupled to the headrest of the vehicle seat. In another sensing system, occupant sensors in the form of either force sensing resistors or mechanical switches are embedded in the seat back cushion and the seat bottom cushion to generate signals which are processed by the controller to generate a control signal for use by an air bag actuation circuit to prevent air bag deployment when the controller determines that the vehicle seat is either unoccupied or is occupied by a rear-facing child car seat. The controller includes control logic to distinguish between a properly seated occupant and the rear-facing infant seat based on the electrical output signals from the occupant sensors located in the seat back and bottom cushion.
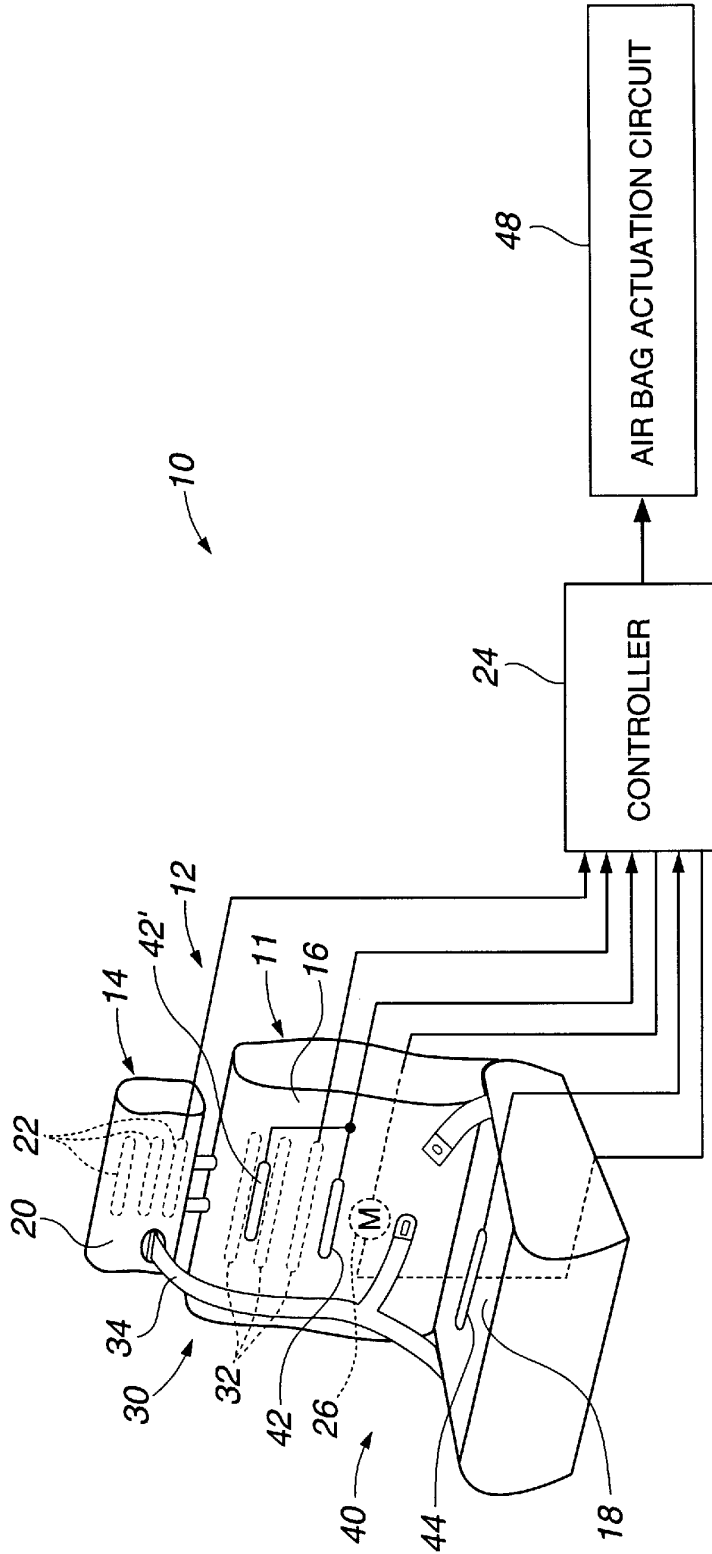
13 Claims, 6 Drawing Sheets

Fig. 1

AIR BAG ACTUATION CIRCUIT

CONTROLLER

Fig. 3
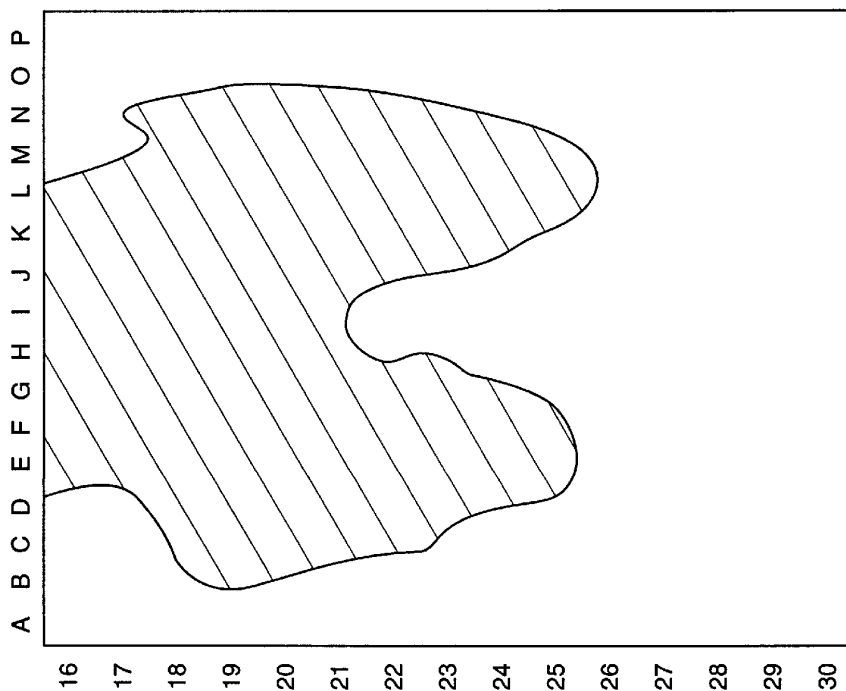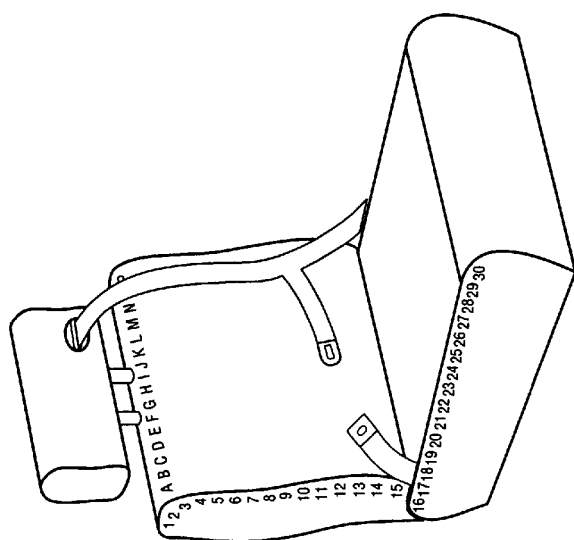
Fig. 4

Fig. 2
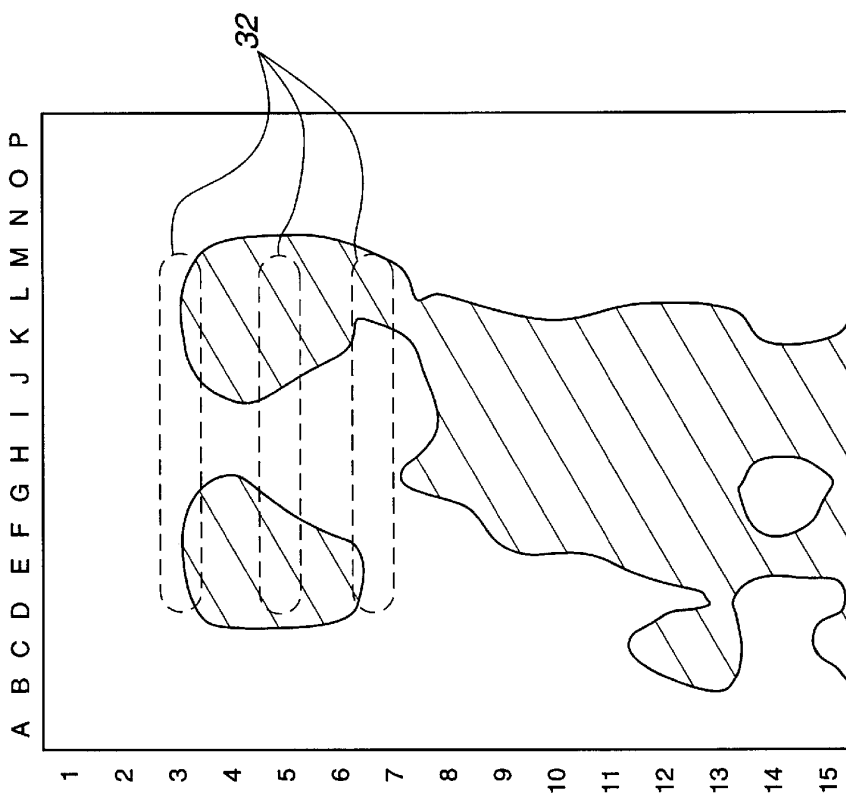
Fig. 5b

Fig. 5a

Fig. 5c

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