APPLICANTS: DUANE DONALD FORTUNE, LEBANON, IN; ROBERT JOHN CASHLER, KOKOMO, IN.

CONTINUING DATA********
VERIFIED THIS APPLN IS A CIP OF 08/566,029 12/01/95 PAT 5,732,37

FOREIGN/PCT APPLICATIONS********
VERIFIED

FOREIGN FILING LICENSE GRANTED 10/22/97

Foreign priority claimed / 35 USC 119 conditions met / Verified and Acknowledged (Examiner's initials)	AS FILED	STATE OR COUNTRY	SHEETS DRWGS.	TOTAL CLAIMS	INDEP. CLAIMS	FILING FEE RECEIVED	ATTORNEY'S DOCKET NO.
☐ yes ☑ no / ☐ yes ☐ no		IN	0	27	3	$924.00	H-198080

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TITLE: OCCUPANT DETECTION METHOD AND APPARATUS FOR AIR BAG SYSTEM

U.S. DEPT. OF COMM./ PAT. & TM—PTO-436L (Rev.12-94)

8-18-99

PARTS OF APPLICATION FILED SEPARATELY

Applications Examiner

NOTICE OF ALLOWANCE MAILED: 8.18.99

Yonel Beaulieu
Assistant Examiner

CLAIMS ALLOWED

Total Claims	Print Claim
27	17

ISSUE FEE

Amount Due	Date Paid
$ 1210	10,5 99

DRAWING

Sheets Drwg.	Figs. Drwg.	Print Fig.
5	10	8

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ISSUE BATCH NUMBER: A36

PREPARED FOR ISSUE

Label Area

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Form PTO-436A (Rev. 8/92)

T. Dyson

Formal Drawings

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

07/15/1997 EKURTZ 00000040 DAH:040549 08868338
01 FC:101 770.00 CH
02 FC:103 154.00 CH

PTO-1556
(5/87)

Commissioner of Patents and Trademarks
Box Patent Application
Washington, D.C. 20231

Sir:

Enclosed for filing are the following patent application papers:

Docket No.: H-198088

Inventors: DUANE DONALD FORTUNE
ROBERT JOHN CASHLER

Title: OCCUPANT DETECTION METHOD AND APPARATUS FOR AIR BAG SYSTEM

Filing Fee Formula

Basic Fee	$	770.00
Additional Fees:		
Number of independent claims in excess of 3, times $80.00	$	0.00
Number of claims in excess of 20, times $22.00	$	154.00
Multiple dependent claim, add $260.00	$	0.00
Total Filing Fee	$	924.00

The patent specification H-198088 entitled OCCUPANT DETECTION METHOD AND APPARATUS FOR AIR BAG SYSTEM and filed in the Patent and Trademark Office herewith is the patent specification for which the inventor(s) executed the Declaration enclosed herewith.

Please charge the $924.00 filing fee to Delco Electronics Corporation Deposit Account No. 04-0549.

JIMMY L. FUNKE
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317/451-3481

Enclosures

using an occupant detection device and particularly to an airbag system having seat pressure detectors in the seat.

Background of the Invention

The expanding use of supplemental inflatable restraints (SIRs) or air bags for occupant protection in vehicles increasingly involves equipment for the front outboard passenger seat. The driver side air bag has been deployed whenever an imminent crash is sensed. The position and size of the driver is fairly predictable so that such deployment can advantageously interact with the driver upon a crash. The passenger seat, however, may be occupied by a large or a small occupant including a baby in an infant seat. It can not be assumed that a passenger of any size is at an optimum position (leaning against or near the seat back). In a system designed for effective interaction with a full sized adult, an advantageous interaction with a small person may not be attained. In such cases it is preferred to disable the passenger side airbag when a small person occupies the seat or when the seat is empty.

It has been proposed in U.S. Patent No. 5,474,327 to Schousek, entitled "VEHICLE OCCUPANT RESTRAINT WITH SEAT PRESSURE SENSOR", and in U.S. Patent ~~Application SN 08/566,829 to Cashler, entitled "METHOD OF INHIBITING OR ALLOWING AIR BAG DEPLOYMENT", filed December 1, 1995,~~ No. 5,732,375 issued March 24, 1998 and assigned to the assignee of this invention, to incorporate pressure sensors in the passenger seat and monitor the response of the sensors by a microprocessor to evaluate the weight and weight distribution, and for inhibiting deployment in certain cases. These disclosures teach the use of sensors on the top surface of the seat, just under the seat cover, and algorithms especially for detecting the presence and orientation of infant seats. Both of these disclosures form a

Summary of the Invention

It is therefore an object of the invention to discriminate in a SIR system between large and small seat occupants for a determination of whether an airbag deployment should be permitted. Another object in such a system is to maintain reliable operation in spite of dynamic variations in sensed pressures.

A SIR system, as is well known, has an acceleration sensor to detect an impending crash, a microprocessor to process the sensor signal and to decide whether to deploy an air bag, and a deployment unit fired by the microprocessor. An occupant detection system can determine if an occupant or infant seat is positioned in a way to not benefit from deployment, and then signaling the microprocessor whether to allow or inhibit deploying the air bag.

A number of sensors, judicially located in the seat, can garner sufficient load and distribution information to allow determination of the occupant size. Each sensor is a very thin resistive device, having lower resistance as pressure increases. This information is then used to determine whether to inhibit airbag deployment. The sensors are arranged in groups in the seat. A microprocessor is programmed to sample each sensor, determine a total weight parameter by summing the forces, determine the forces on local groups of sensors, and averaging or filtering to provide several different measures of seat occupancy, each of which can be used determine whether to allow deployment.

Brief Description of the Drawings

DOCKET ALARM

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