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[54] SLEEP DETECTION AND DRIVER ALERT APPARATUS

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[58] Field of Search 340/575, 576

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[57] ABSTRACT

A sleep detection and driver alert apparatus has a compact housing that can be placed around the rearview mirror or on the dashboard. It contains all lenses and electronic detection mechanisms for monitoring the effects of early impending sleep by means of an infrared auto-focusing, digital, image stabilizing lens with zoom capability. Additionally, the unit contains an added infrared thermal sensor for the monitoring and evaluation of different ambient temperatures around the facial areas of the nose and mouth. These temperature changes will be that of the exhaled gas plume of normal breathing patterns, which will lower in volume as the driver begins to hypoventilate, thus increasing their blood level of carbon dioxide which is in most part the reason for early drowsiness associated with sleep. The device will monitor via the infrared camera the thermal image changes in pixel color of open versus closed eyes of the driver via the temperature sensitive infrared portion of the digitized photographic image passed through a video charge coupling device. The combination of non movement and a decrease in breath temperature, which is a physiological response to hypoventilation thus initiating drowsiness, will trigger the infrared camera to zoom onto the eye region of the driver. This combined data is routed to the sleep status microprocessor memory via the optical image detector and thermal sensor for data changes above or below baseline data measurements.

11 Claims, 5 Drawing Sheets

