Title: A security screen for passenger vehicles

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ABSTRACT

A security screen for a passenger vehicle having front and rear compartments, comprising:

barrier means for separating said front compartment from said rear compartment, said barrier means having a first barrier segment comprising a first screen arranged so as to closely abut the interior roofline of said passenger vehicle on its top edge and to closely abut the side interior of said passenger vehicle on either edge mounted to a first frame, and a second barrier segment comprising a second screen arranged so as to closely abut the interior footwell of said vehicle mounted to a second frame, said first barrier segment and said second barrier segment being rigidly connected subsequent to their location in said passenger vehicle; and

fixing means for securement to pre-existing fittings in said passenger vehicle, said fixing means comprising a bracket affixed to said second barrier segment and adapted for securement to a front seat belt lower anchor mounting.
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COMPLETE SPECIFICATION
STANDARD PATENT

Applicant:
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Invention Title:
A SECURITY SCREEN FOR PASSENGER VEHICLES

The following statement is a full description of this invention, including the best method of performing it known to me/us:
A SECURITY SCREEN FOR PASSENGER VEHICLES

The present invention is concerned with a security screen for passenger vehicles and, more particularly, with a security screen for passenger vehicles such as police vehicles which prevents access to the front compartment of such a vehicle from the rear compartment so as to allow the transport of prisoners in conventional passenger vehicles. However, it will be appreciated that security screens in accordance with the present invention may be used in other applications, for example, to protect the driver of passenger vehicles such as taxis from attack by passengers.

At present, prisoners are transported in highly modified vehicles, commonly known as "divisional vans". These are typically heavily modified panel vans or vehicles built on a light truck, 4WD dual cab or utility chassis comprising a passenger cabin similar to those in conventional trucks and a caged enclosure to the rear of the cabin to which access is gained through a door built at the rear of the enclosure. These vehicles are purpose built and so are expensive to build. Moreover, a divisional van is not always available when an arrest is made, and in this circumstances the person arrested maybe transported in the rear of a conventional passenger vehicle. Since these vehicles do not have any means of preventing the person arrested from leaping into the front seat of the vehicle and, perhaps, attacking the driver it is necessary to restrain that person either through using handcuffs and the like or by seating police officers in the back seat with the person. However, additional police officers are not always available for this purpose and, in any event, this represents a substantial burden on the available manpower.

Crude solutions to this problem have been
proposed previously. For example, a steel grille has been placed across the interior of the passenger cabin dividing it into front and rear compartments, but vehicles modified in this way do not conform to the relevant Design Standards since such a barrier is dangerous in a crash. Such barriers are fitted by drilling into the chassis of the vehicle and then bolting, hence installation is expensive. Moreover, the occupants of the front compartment are not protected from small articles or fluids being showered upon them from the rear compartment. In addition, a screen of this type is visually intimidating to a prisoner as well as being expensive and difficult to fit to passenger vehicles.

In the United States, solid steel barriers have been fitted in a similar manner to the grilles discussed above. While this prevents a prisoner in the rear compartment from hurling small articles or fluid into the front compartment, a solid steel barrier is just as dangerous, if not more dangerous, than a steel grille in a crash. Moreover, a solid screen of this type hinders all round vision and, in particular, severely restricts viewing of the prisoner in the rear compartment. Such a screen is undoubtedly intimidating to a prisoner, and does not allow for communication between the arresting officers and the prisoner. Thus, the officers cannot calm an agitated suspect or give instructions to a prisoner. Moreover, ventilation in a rear compartment formed in this way is very restricted since the rear seat vents typically provided in passenger vehicles are blocked by the screen. Thus, there remains a need for security screens of this type which, at least in preferred embodiments of the invention, fulfil one or more of the following criteria:

(1) are cheap and easy to fit to passenger vehicles;

(2) are less visually intimidating than conventional screens and allow for communication with a
prisoner; and

(3) provide for prisoner comfort through enhanced ventilation.

According to a first aspect of the present invention there is provided a security screen for passenger vehicle having front and rear compartments, comprising:

barrier means for separating said front compartment from said rear compartment, said barrier means having a first barrier segment comprising a first screen arranged so as to closely abut the interior roofline of said passenger vehicle on its top edge and to closely abut the side interior of said passenger vehicle on either edge mounted to a first frame, and a second barrier segment comprising a second screen arranged so as to closely abut the interior footwell of said vehicle mounted to a second frame, said first barrier segment and said second barrier segment being rigidly connected subsequent to their location in said passenger vehicle; and

fixing means for securement to pre-existing fittings in said passenger vehicle, said fixing means comprising a bracket affixed to said second barrier segment and adapted for securement to a front seat belt lower anchor mounting.

Typically, said bracket includes a slot adapted to receive a bolt which also serves to secure a seat belt to said front seat belt mounting.

Typically, said bracket overlies that portion of the seat belt through which it is bolted to said front seat belt mounting.

Preferably, said bolt is longer than the bolt ordinarily used to secure the seat belt to said front seat belt mounting.

Said fixing means may further comprise a bracket affixed to said first barrier segment and adapted for securement to a pre-existing hole in the B pillar of said passenger vehicle.
Typically, said bracket includes a hole adapted to receive a bolt.

It is particularly preferable that said fixing means comprises both a bracket adapted for securement to a front seat belt mounting and a bracket adapted for securement to a pre-existing hole in the B pillar of said passenger vehicle.

The security screen for passenger vehicles having front and rear compartments may also include a window to allow viewing of said rear compartment from said front compartment and drive means adapted for opening and closing said window.

Preferably, said window is made of a clear, impact resistant material, although it may carry a tint or even be translucent or opaque.

More preferably, said window is made of a polycarbonate such as LEXAN.

Typically, said drive means comprises a hydraulic ram. However, any suitable drive means may be used.

The security screen for passenger vehicles having front and rear compartments may also include:
ventilation means adapted to bring said front compartment and said rear compartment into fluid flow connection; and

collection means for channelling air from rear seat vents in said passenger vehicle to said ventilation means.

Advantageously, said ventilation means comprises flow-through vent holes. Typically, the holes are located in the second barrier segment just below its top edge.

Preferably, said collection means comprises a housing which encompasses all rear seat vents and is configured so as to guide air from said vents to the vent holes. Typically, the housing press-fits through complementary male and female members to the second barrier segment.
Typically, abutting portions of said first frame and said second frame contain orifices to allow for securement.

Typically, said first frame and said second frame are bolted together through said orifices.

Advantageously, head impact cushions are fitted to the rear of said barrier means, typically to the rear of said first barrier segment at the height where the head of a passenger in said rear compartment would strike the security screen in the event of a crash.

Alley lights can be fitted to the side of the security screen instead of to the side of the vehicle itself as in conventional practice.

Any other suitable fitments and attachments may be fixed to the security screen subsequent to its installation, particularly if attachment prior to installation would complicate the installation.

In a particularly preferred embodiment of the invention said first barrier segment is affixed to said second barrier segment after installation of the segments. Typically, they are joined by bolting the two together where there is overlap of the two segments.
Typically, the screen portion of said first barrier segment is made from KEVLAR-impregnated fibreglass or plastic. Likewise, the screen portion of said second barrier segment is typically made of KEVLAR-impregnated fibreglass or plastic. The head impact cushions preferably include padding made from high density foam.

Typically, a steel frame is provided to support the barrier segments of the screen. This steel frame includes the brackets adapted for bolting to the interior of the vehicle.

Typically, the window to allow for viewing of the rear compartment is centrally located but smaller windows may be located to either side of the central window with the head impact cushions located below said side windows. Any such side windows are also made of a polycarbonate such as LEXAN.

Preferred embodiments of the invention will now be described by way of example only, with reference to the accompanying drawings, in which:

Fig 1 is a perspective view of a security screen in accordance with the present invention as viewed from the rear compartment;

Fig 2 is a view similar to Fig 1 but seen from the front;

Fig 3 is an elevation of the security screen shown in Fig 1 but seen from the front;

Fig 4 is a plan view of the security screen shown in Fig 1; and
Fig 5 is a side view, partially in section, of the security screen shown in Fig 1.

The security screen 10 shown in the Figures comprises barrier means consisting of a first barrier segment 11 and a second barrier segment 12, each moulded from KEVLAR-impregnated fibreglass or plastic. Together the first barrier segment 11 and second barrier segment 12 form a partition between the front compartment of a vehicle and the rear compartment of a vehicle. Typically, the partition is located just to the rear of the front seats and so separates the occupants of the front compartment from the occupants of the rear compartment. In addition, there is provided a housing 13 for directing ventilation to vent holes 21, 22, which is connected to the second barrier segment by a press-fit arrangement.

The first barrier segment includes a central window 15 which can open and close under the urging of drive means, in this case hydraulic ram 16. The first barrier means 11 also includes two side windows 17, 18. All of the windows are made of LEXAN and carry a grey tint. Beneath the side windows 17, 18 are located head impact cushions 19, 20, each made of a high density foam padding material. It will be appreciated that the surface of the security screen facing the occupants of the rear compartment is a smooth and relatively soft barrier which is padded in the place most likely to suffer a head impact in a crash, hence meets all relevant Design Standards for safety of the rear seat occupants.

Ventilation is provided to the rear compartment through vent holes 21, 22. Housing 13 has its intake 36 on the front compartment side of the security screen 10. The housing 13 is designed so that its intake 36 fits over the rear seat vents provided in the passenger vehicle to which the screen 10 is installed. The housing 13 in this case is
bell-shaped and directs air from the rear seat vents to vent holes 21, 22, and a sufficient flow of air is provided through its outlet to the vent holes 21, 22 to provide adequate ventilation for the rear compartment.

With reference to Figs 2 and 5, it will be appreciated that the first barrier segment 11 and second barrier segment 12 are each reinforced by steel frames 23, 24. The steel frame 23 broadly conforms to the shape of the side interior and roofline of the vehicles, but the KEVLAR-impregnated fibreglass or plastic panels which it supports are moulded so as to meet the surface of the interior of the vehicle along the entire length of the edge. The steel frame 24 is generally U-shaped and steel frame 23 rests upon it when the first barrier segment 11 and second barrier segment 12 are joined. Typically, this is by bolting the two together, with the bolt extending through the steel frames when juxtaposed. The KEVLAR-impregnated fibreglass or plastic moulding forming second barrier segment 12 conforms precisely to the side of the vehicle along its side edges and generally to the foot well of the vehicle along its bottom edge.

As will be apparent from Fig 2, the steel frame 23 includes brackets 25, 26 which are bolted to the B pillar of the vehicle and the steel frame 24 includes brackets 27, 28 which are bolted to the front seat belt lower anchor mounting. Each of brackets 25, 26 has a hole 32, 33 formed therein adapted to receive a bolt (not shown). It will be appreciated that passenger vehicles are typically manufactured with three pre-existing fittings formed in the B pillar, two to receive a rail on which an adjustable seat belt mounting is fixed and one to receive a conventional seat belt fitting. This allows for luxury models of a particular vehicle to have a height adjustable seat belt but for standard models of the same vehicle to have a conventional seat belt without the car manufacturer
needing to retool to produce the different models. Thus, the B pillar always includes a hole for a standard seat belt fitting if it includes a height adjustable seat belt or two holes allowing for fittment of a height adjustable seat belt if it has a standard seat belt fitted. In order to fit brackets 25, 26, they are positioned adjacent whichever of the holes in the B pillar is available and a bolt is used to secure the brackets 25, 26 to the B pillar through holes 32, 33, and said bolt extends through holes 32, 33 into the existing fitting. The lining which usually covers the B pillar can then be placed over the arrangement to hide the fitting. Brackets 27, 28 are secured to the front seat belt lower anchor mounting in similar, but not identical, fashion. The slots 34, 35 are positioned so as to receive the bolt (not shown) used to secure the front seat belt to the front seat belt lower anchor mounting and so this bolt, which is slightly longer than usual, holds both brackets 27, 28 and the front seat belt to the front seat belt lower anchor mounting.

As best seen in Fig 2 the head impact cushions 19, 20 are bolted to anchor points 29, 30 on the front face of the security screen. Likewise, a housing 31 for window 15 when it is in the fully open position is provided on this face of the security screen 10 and the hydraulic ram 16 is located on this face of the security screen 10. However, it will be appreciated that the security screen 10 is located just behind the seats in the front compartment and, in any event, the occupants of the front seats are protected by those seats from any impact from their rear in the event of a crash.

In order to assemble the security screen 10, housing 13 and second barrier segment 12 are installed in an appropriate location. First barrier segment 11 is then positioned on the top edge of second barrier segment 12. The two are then bolted together in order to create the
finished security screen 10, although it will be appreciated that hydraulic ram 16 and other elements such as head impact cushions 19, 20 can be secured to first barrier segment either after it is positioned in the vehicle or before. Once installed, there is provided a solid security screen to prevent access to the front compartment from the rear compartment and also adapted to prevent the intrusion of missiles or fluids from the rear compartment into the front compartment. The security screen 10 is easy to install as described above and provides for adequate ventilation of the rear compartment. If it is desired to communicate with the occupants of the rear compartment the hydraulic ram 16 is operated to lower window 15 a sufficient amount that voice communication can be initiated. However, it will be appreciated that in the event of carrying a prisoner who is dangerous or agitated in the rear compartment it would not be desirable to lower the window 15 more than a distance of a few centimetres so that the function of the security screen to prevent missiles and the like is not compromised. On the other hand, if the occupant of the rear seat is not dangerous or aggressive, the window 15 can be lowered all the way to allow for comfortable conversation without the occupant of the rear compartment feeling intimidated by the nature of the screen.

Throughout this specification and the claims, the words "comprise", "comprises" and "comprising" are used in a non-exclusive sense.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A security screen for a passenger vehicle having front and rear compartments, comprising:

   barrier means for separating said front compartment from said rear compartment, said barrier means having a first barrier segment comprising a first screen arranged so as to closely abut the interior roofline of said passenger vehicle on its top edge and to closely abut the side interior of said passenger vehicle on either edge mounted to a first frame, and a second barrier segment comprising a second screen arranged so as to closely abut the interior footwell of said vehicle mounted to a second frame, said first barrier segment and said second barrier segment being rigidly connected subsequent to their location in said passenger vehicle; and

   fixing means for securement to pre-existing fittings in said passenger vehicle, said fixing means comprising a bracket affixed to said second barrier segment and adapted for securement to a front seat belt lower anchor mounting.

2. A security screen as claimed in claim 1 wherein said bracket includes a hole adapted to receive a bolt which also serves to secure a seat belt to said front seat belt lower anchor mounting.

3. A security screen as claimed in claim 2 wherein said bracket overlies that portion of the seat belt through which it is bolted to said front seat belt lower anchor mounting.

4. A security screen as claimed in claim 3 wherein said bolt is longer than the bolt ordinarily used to secure the seat belt to said front seat belt lower anchor mounting.
5. A security screen as claimed in claim 1 wherein said fixing means further comprises a bracket affixed to said first barrier segment and adapted for securement to a pre-existing hole in the B pillar of said passenger vehicle.

6. A security screen as claimed in claim 5 wherein said bracket includes a slot adapted to receive a bolt.

7. A security screen as claimed in claim 1 wherein abutting portions of said first frame and said second frame contain orifices to allow for securement.

8. A security screen as claimed in claim 7 wherein said first frame and said second frame are bolted together through said orifices.

9. A security screen as claimed in any one of claims 1 to 8 further comprising a window to allow viewing of said rear compartment from said front compartment.

10. A security screen as claimed in claim 9 wherein said window is made of a clear, impact resistant material.

11. A security screen as claimed in claim 10 wherein said window is made of a polycarbonate.

12. A security screen as claimed in any one of claims 9 to 11 further comprising drive means adapted for opening and closing said window.

13. A security screen as claimed in claim 12 wherein said drive means comprises a hydraulic ram.

14. A security screen as claimed in any one of claims 1 to 13 wherein head impact cushions are fitted to the rear of said barrier means.
15. A security screen as claimed in any one of claims 1 to 14 further comprising ventilation means adapted to bring said front compartment and said rear compartment into fluid flow connection.

16. A security screen as claimed in claim 15 wherein said ventilation means comprises flow-through vent holes.

17. A security screen as claimed in claim 16 further comprising collection means for channelling air from pre-existing seat vents in said passenger vehicle to said ventilation means.

18. A security screen as claimed in claim 17 wherein said collection means comprises a housing which encompasses all rear seat vents and is configured so as to guide air from said vents to said ventilation means.

19. A security screen as claimed in claim 18 wherein said housing snap fits through complementary male and female members to said barrier means.

20. A security screen substantially as herein before described with reference to the accompanying drawings.

Dated this 13th day of August 2002
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By their Patent Attorneys
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