(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
15 January 2009 (15.01.2009)

PCT

(10) International Publication Number
WO 2009/007972 A2

(51) International Patent Classification:
F41H 5/04 (2006.01)

(21) International Application Number:
PCT/IL2008/000953

(22) International Filing Date: 10 July 2008 (10.07.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
184533 11 July 2007 (11.07.2007) IL

(71) Applicants and
(72) Inventors: **LABOCK, Niza** [IL/US]; 13075 NW 23 St., Pembroke Pnes, Florida 33028-2549 (US). **LABOCK, Or** [IL/IL]; 43 Leshem St., 75436 Rishon Le'zion (IL).

(74) Agent: **DR EYAL BRESSLER LTD**; 11 Tuval St, 52522 Ramat Gan (IL).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:
— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

Published:
— *without international search report and to be republished upon receipt of that report*

(54) Title: PERSONAL PORTABLE BALLISTIC PROTECTION FOR MOTOR VEHICLE OCCUPANTS

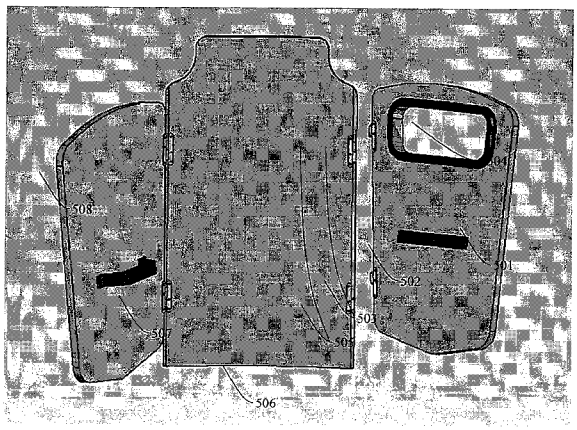


Fig. 5

(57) Abstract: The present invention discloses a means for ballistic protection from explosions and weapons fire for occupants of a motor vehicle. This is accomplished by means of three or four largely planar units composed of material proven to be capable of resisting small arms fire. These units are linked by hinges to for a protective shell on three or four sides of the occupant(s), and are optionally provided with ballistic grade windows. The hinges or other attachment means can be rapidly detached, within a matter of seconds. Then each unit may be used as a personal shield. The side units may be optionally provided with ballistic grade windows to allow side and/or front visibility. The device is modular and designed to fit within most passenger motor vehicles such as cars, jeeps, personnel carriers, aircraft, helicopters, etc.

WO 2009/007972 A2

PERSONAL PORTABLE BALLISTIC PROTECTION FOR MOTOR VEHICLE OCCUPANTS

FIELD OF THE INVENTION

The present invention relates to a method and apparatus for protection of motor vehicle occupants against armed attack.

BACKGROUND OF THE INVENTION

Civil unrest, political uncertainty, business-related intrigue, and the seething rage of the exploited underclass are but a few of the myriad possible reasons underlying violence against individuals. Systems and methods to protect oneself from violence such as assassination attempts on motorcades thus are not lacking in the patent literature. However a truly portable system against ballistic attack, that can fit any motor vehicle, and provide complete side protection while allowing visibility, has yet to be disclosed.

For example, US patent application 2006/0243126 provides a personal armor system. With reference to Fig. 1 one sees for example a seat armor kit (1), comprising a plurality of armor components (2,3,4,5). Each component is configured for selective use in a plurality of different roles, for example being for use in different types of vehicle and also in buildings or aircraft. While this system does provide a number of useful embodiments there are several characteristics that leave a need. In particular, the armor components are described as comprising 'at least: a seat base armor component, a seat back armor component, and at least one seat side armor component.' (Par. 39). It will be appreciated that the inclusion of unneeded components can only hinder the operation of the device, which will become more bulky as extra components are added. The seat base armor component, in particular, serves as a necessary component of the 'stretcher form' of the invention, which is intended to provide multiple reconfigurable forms. However the seat form will not in general require this component, since the protection required is generally from projectile fire which can only come from the sides. A streamlined device will not be burdened

by the requirement of a seat base armor component, which is included for use in helicopters which may sustain ground fire, and hence is not particularly relevant for ground vehicles. Furthermore it is evident from the specification and figures accompanying the patent application that the 'armor components conforms very closely to the inside structures of the vehicle...so that the presence of the armor components is not readily detectable.' [123]. It will be clear to one skilled in the art that this requirement makes the possibility of modular 'one-size-fits-all' construction an impossibility due to the wide geometric variability of vehicle interior designs. Furthermore there is no provision made for front protection; thus no provision is made for dealing with projectiles coming e.g. through the front window of a passenger car. Finally no provision is made that a side armor component be provided with a ballistic-protection window, to allow the user some visibility. Rather it appears the intent of the invention is that the side armor components are small enough that the user sees around them. It will be clear to one skilled in the art that a side armor component that is so small as to allow visibility, will allow an attacker to attack precisely along this line of sight connecting the user to the outside of the vehicle. The ballistic protection in fact provided by US patent application 2006/0243126 provides for separate attachable window units, which will again suffer from a lack of universal applicability due to the great geometric variation in car window configurations. Finally when used as a personal shield the need for a ballistic window within the shield itself will be obvious to one skilled in the art; if one cannot see an attacker, one cannot defend or flee effectively.

US patent 6688554 provides a cushion, preferably of a buoyant material, including a layer of threat-resistant material for precluding penetration by a projectile from a firearm or sharp edged or sharp pointed instrument and serves in the manner of a shield to prevent injury to a person's shielded body parts. The threat-resistant material may envelope the cushion, be disposed on either the front or the back side or be interleaved between the front and back sides. One or more straps may be disposed on a side to facilitate manipulation in positioning of the cushion to render it most effective to ward off an attack. One embodiment of this invention is shown in Fig. 2. It is clear that while this invention does provide some level of ballistic protection in addition to flotation, there is no provision for

full-body protection including front and side directions. No provision is made for this cushion to be easily transferable to a multitude of different vehicles, either; rather, the unit is designed mainly for use in an airplane seat. No provision is made in this invention that the unit may be used as a personal shield for ballistic protection, and neither is provision made for a ballistic-grade window to be included in the device.

US patent 5164536 provides a composite armored seat, and method of manufacture thereof. The seat comprises panels made of ceramic matrix composite and assembled to one another by shape and by adhesion, either by interposition of an adhesive or else by densification using the ceramic matrix material. The invention is particularly suitable for armored seats for helicopters. As seen in Fig. 3, the unit comprises a single piece when assembled, and is not intended to be disassembled with any degree of ease or rapidity. Thus while indeed providing protection from gunfire in a helicopter, the unit cannot be removed easily for use as a personal shield. Neither is provision made for ballistic-grade windows to be used, to allow for side visibility. The level of side protection is furthermore somewhat limited. Finally, no provision is made for use of extant vehicle restraints (e.g. seatbelts), rendering the device less useful in an automotive setting.

US patent 4015875 provides a vertical sliding automobile partition including a curved vertical sliding partition window which, to provide greater rear seat legroom, is mounted on vertically curved tracks attached to the front surface of a shield plate separate from and located behind the front seat backrest. The shield plate and partition are attached to a roll bar to form an integral unit which is removably mounted on the body of the automobile to enable the unit to be removed without damage for use on another automobile (see Fig. 4). While providing some level of protection, this unit is not designed to provided full side or front protection from ballistic projectiles. Furthermore no provision is made for the removal of the device for use as a personal shield. Neither is any sort of ballistic-grade window provided to allow for visibility while still providing full side protection.

US patent 7070242 provides as armor system with monolithic ceramic shell. The ceramic shell includes two or more of an upper portion, a curved portion, and a

seat portion. At least one of the upper portion, the curved portion, and the seat portion includes at least one of a first side portion and a second side portion. Again however while providing some level of protection, this unit is not designed to provided full side or front protection from ballistic projectiles. Furthermore no provision is made for the removal of the device for use as a personal shield. Neither is any sort of ballistic-grade window provided to allow for visibility while still providing full side protection. No provision is made for different segments of the device to be separated from each other easily for separate use.

Hence, a modular system for providing ballistic protection for occupants of any motor vehicle without modification of the vehicle or the modular system, which provides full front and side protection, provides a ballistic grade window for visibility, and can be broken down into components which can be used as a personal shield, is still a long felt need.

BRIEF DESCRIPTION OF THE DRAWINGS

In order to understand the invention and to see how it may be implemented in practice, a plurality of embodiments will now be described, by way of non-limiting example only, with reference to the accompanying drawings, in which

Fig. 1 presents prior art of US patent application 2006/0243126 ;

Fig. 2 presents prior art of US patent 6688554;

Fig. 3 presents prior art of US patent 5164536; and

Fig. 4 presents prior art of US patent 4015875.

Fig. 5 presents a representative view of one embodiment of the present invention including two side panels and one back panel.

Fig. 6 presents a representative view of one embodiment of the present invention illustrating a hinge coupling between panels.

Fig. 7 presents a photograph of one embodiment of the present invention including two side panels and one back panel.

Fig. 8 presents a photograph of one embodiment of the present invention showing its placement in a motor vehicle and protecting an occupant of said vehicle.

Fig. 9 presents a photograph of one embodiment of the present invention showing its placement in a motor vehicle and protecting an occupant of said vehicle.

Fig. 10 presents a photograph of one embodiment of the present invention showing its placement in a motor vehicle and allowing egress from said vehicle.

Fig. 11 presents a photograph of one embodiment of the present invention showing its placement in a large vehicle, and provided with a ballistic window for visibility.

Fig. 12 presents a photograph of one embodiment of the present invention showing its placement in a large vehicle, and illustrating use of the vehicles original restraining devices.

Fig. 13 presents a photograph of one embodiment of the present invention showing its placement in a motor vehicle, with two back panels joined for a large seating space.

Fig. 14 presents an illustration of a panel of the device being used as a personal shield.

Fig. 15 presents a photograph of a panel of the device being used as a personal shield.

Fig. 16 presents a photograph of two rear panels, where the intervening side panels have been moved forward to provide front protection.

SUMMARY OF THE INVENTION

It is within the core of the present invention that ballistic protection from small arms fire be provided to occupants of a motor vehicle. This is accomplished by means of three or four largely planar units composed of material proven to be

capable of resisting small arms fire. These units are linked by hinges that can be rapidly detached, within a matter of seconds. Then each unit may be used as a personal shield. The side units may be optionally provided with ballistic grade windows to allow side and/or front visibility.

It is an object of the invention to provide a system for personal ballistic protection in a motor vehicle comprising:

one or more side panels comprising ballistic material, and provided with handles and side attachment means;

one or more back panels comprising ballistic material, and provided with back attachment means adapted for removably mating with said side attachment means, said back panels being disposed perpendicular to and behind said side panels, and said back and side panels being adapted to be placed within a motor vehicle;

wherein said side panels and said back panels form a modular protective shell around a passenger or driver of any motor vehicle without modification of said motor vehicle, providing protection from ballistic weapon fire and explosion.

It is a further object of the invention to additionally provide a ballistic grade window in one or more of said side panels.

It is a further object of the invention wherein said attachment means are selected from a group consisting of: hinges, Velcro, magnets, clasps, and hooks.

It is a further object of the invention wherein said side and back panels may be detached or attached to one another rapidly, within a time period of about five seconds.

It is a further object of the invention wherein said panels may be used as personal shields.

It is a further object of the invention wherein a plurality of said personal shields may be linked together to form a protective barrier.

It is a further object of the invention wherein said panels are composed of materials selected from a group consisting of: Kevlar®, Dyneema®, polyethylene, ceramic, and combinations thereof.

It is a further object of the invention wherein said panels are encased within a cosmetically appealing cover.

It is a further object of the invention to additionally provide a carrying case.

It is a further object of the invention to fit any motor vehicle passenger or driver space.

It is a further object of the invention wherein said motor vehicle is selected from a group comprising automobile, lorry, truck, jeep, ambulance, earth-moving vehicle, construction vehicle, demolition vehicle, bulldozer, plough, harvester, mine-sweeper, armored vehicle, tank, personnel carrier, tractor, crane, taxi, limousine, bus, coach, train , locomotive, boat , ship, submarine other seagoing vessel, and aircraft.

It is a further object of the invention additionally providing panels comprising ballistic materials adapted to rotate down from a location close to or on the drivers sunshield, thereby providing protection for the front passengers against ballistic attack from the direction of the front windshield.

It is a further object of the invention wherein said panels are concertina like and are adapted to drop down from a folded configuration to an extended configuration.

It is a further object of the invention wherein said panels are additionally provided with a window.

It is a further object of the invention wherein said ballistic material conforms to a recognized standard.

It is a further object of the invention wherein said standard is selected from a group consisting of NIJ Standard 0103.03 Level IIIA, Level III, or Level IV.

It is a further object of the invention wherein said panels are adapted to allow the passenger to utilize said motor vehicle's safety restraint system without modification thereof.

While the invention is susceptible to various modifications and alternative forms, specific embodiments thereof have been shown by way of example in the drawings and will herein be described in detail. It should be understood, however, that it is not intended to limit the invention to the particular forms disclosed, but on the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The following description is provided, alongside all chapters of the present invention, so as to enable any person skilled in the art to make use of said invention and sets forth the best modes contemplated by the inventor of carrying out this invention. Various modifications, however, will remain apparent to those skilled in the art, since the generic principles of the present invention have been defined specifically to provide portable ballistic protection for motor vehicle occupants.

In the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of embodiments of the present invention. However, those skilled in the art will understand that such embodiments may be practiced without these specific details. Reference throughout this specification to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the invention. Thus, the appearances of the phrases "in one embodiment" or "in an embodiment" in various places throughout this specification are not necessarily all referring to the same embodiment or invention. Furthermore, the particular features, structures, or characteristics may be combined in any suitable manner in one or more

embodiments. Lastly, the terms "comprising", "including", "having", and the like, as used in the present application, are intended to be synonymous.

The term '**bulletproof**' refers to the capability of conforming to the NIJ standard II-A or higher.

The term '**ballistic material**' refers to material capable of providing protection at the level of NIJ standard IIIA or higher, such as Kevlar®, Dyneema®, polyethylene, and the like.

The term '**ballistic grade**' refers to the capability of conforming to the NIJ standard III-A or higher.

The term '**ballistic grade window**' refers to a window that can resist arms fire at the level of NIJ standard III-A or higher. Such windows are often composed of polycarbonate, Lexan, or may use polyester retention films.

The National Institute of Justice has defined several levels of ballistic protection, shown in Table I.

NIJ Standard - 0101.03 BULLET RESISTANCE OF PERSONAL BODY ARMOR							
Armor Type	Test Round	Test Ammunition	Nominal Bullet Mass	Minimum Required Bullet Velocity	Required Fair Hits Per Armor Part at 0° Angle of Incidence	Maximum Depth of Deformation	Required Fair Hits Per Armor Part at 30° Angle of Incidence
II-A	1	357 Magnum JSP	10.2g	381 m/s (1250 ft/s)	4	44mm (1.73in)	2
	2	9 mm FMJ	8.0g	332 m/s (1090 ft/s)	4	44mm (1.73in)	2
II	1	357 Magnum JSP	10.2g	425 m/s (1395 ft/s)	4	44mm (1.73in)	2
	2	9 mm FMJ	8.0g	358 m/s (1175 ft/s)	4	44mm (1.73in)	2
III-A	1	44 Magnum Lead SWC Gas Checked	15.55g	426 m/s (1400 ft/s)	4	44mm (1.73in)	2
	2	9 mm FMJ	8.0g	426 m/s (1400	4	44mm (1.73in)	2

				ft/s)			
III		7.62 mm (308 Winchester) FMJ	9.7g	838 m/s (2750 ft/s)	6	44mm (1.73in)	0
IV		30-06 AP	10.8g	868 m/s (2850 ft/s)	1	44mm (1.73in)	0

Table I – NIJ standard 0101.03

This table provides a standard for personal body armor, giving a maximum allowable depth of deformation for various weapon types. To be classified as a particular armor type, the armor must deform less than the indicated depth for the given test ammunition.

According to a preferred embodiment of the present invention, a modular set of armored plates or panels is provided that can be placed in the seat of a motor vehicle. This includes cars, trucks, buses coaches, trains, lorries jeeps, armored vehicles, and aircraft. Three such plates can be attached to one another at right angles to provide full rear and side protection.

With reference to Fig. 5 we illustrate an example of an embodiment of the invention. The side panel **501** is provided with a ballistic grade window **504** for visibility. The side panel **501** is also provided with a handle **502** for easily handling said panel. The side panel **501** is also outfitted with hinges **503** which allow them to be attached in a modular fashion to the back panel **506** which has corresponding hinge parts **505**. These hinges are so designed to be easily separated by lifting the side panel up and off the hinge. The side panels can also be produced without windows as in second side panel **508**. This is useful for instance for the interior side; thus in a car, side panel **501** would be on the window side of a car while side panel **508** would be on the interior side of the car.

With reference to Fig. 6 an illustrative example of the hinge mechanism is shown. This example shows a butt or barrel hinge. The key element here is simply that the hinge sides **602**, **603** may be separated. Then the armor plates **601** are separated and can be removed for use as personal shields, body armor, or the like. It will be clear to one skilled in the art that other methods of attachment are possible that will full the need of a quick-release attachment allowing relative

rotation between attached members, including hooks, magnets, Velcro®, clasps, and various other quick-release mechanisms.

A fully assembled unit can be seen in Fig. 7 wherein the side panels **701** are attached to the back panel **702**. This unit can be placed into a motor vehicle either as-is or may be assembled in place inside the motor vehicle. In either case the result will be as shown in Fig. 8. Here again the side panels **701** are attached to the back panel **702**. The occupant is surrounded by these panels on three sides, with full side protection. This is a key element of the invention, which most other systems do not provide for. As mentioned in the background section, the use of separate window protection units presents practical difficulties due to the wide variety of possible window geometries. The current invention avoids these complications by combining the entire protection system in the three integral panels

In another embodiment of the invention a fourth panel is added to provide a full surrounding. In one example of this embodiment a front panel is provided with spaces for the legs to protrude. This panel is attached by similar attachment means as above to the two side panels in front of the user, who is now surrounded by the four panels and protected from all sides except above and below. It will be appreciated that in the great majority of cases, especially for terrestrial vehicles, protection is not needed from above or below.

With reference to Fig. 9 we see the example of Fig. 8 from a greater distance. It should be clear from this figure that the panels **701** and **702** provide nearly complete protection in a form that can be easily removed from a given motor vehicle and placed in another, without regard to the exact type or configuration of the vehicle.

In Fig. 10 one sees the easy method of entry and exit from the device. The side panel **701** is simply rotated back (towards the back seat) allowing easy entry or egress of the occupant. The panel can be similarly pushed shut when the occupant is seated within it.

In Fig. 11 the device has been put into service in a suburban. This figure exemplifies one advantage of the invention, namely that the device is adapted to be used, without modification, in a variety of motor vehicles. The side panel here has been fitted with a ballistic-grade window **1101** to allow the passenger to see out of the vehicle while still being protected.

In Fig. 12 one sees one of the core aspects of the invention, namely that the seatbelt **1202** can be used with no modification by threading it through the crack between back panel **1202** and side panel **1201**. This is obviously beneficial for passenger safety and simplifies use of the device since the panels may optionally be restrained by the safety belt without requiring any further restraining devices or modification of the vehicle.

In Fig. 13 one sees a further provision of the invention, wherein two back panels **1301** have been attached by means of hinges to provide a wider protected zone, suitable for two people to sit side by side. The side panel will be complemented by another side panel (not visible, on side opposite **1302**, close to the viewer).

It is within the core of the invention that the panels of the device can used as personal shields. As seen in Fig. 14, a side panel **1402** which is provided with a ballistic grade window **1402**, has been removed from a motor vehicle and is being used as a personal shield. From Fig. 15 it is clear that the handle **1502** allows the user to grip the shield easily.

Fig 16 illustrates a core object of the invention wherein a rear protective module constructed of the aforementioned panels **1601**, **1602** has been used in a vehicle by two back seat passengers. In this case the inner side panels, which would separate the passengers from each other, are now not necessary since the outer side panels are those exposed to fire from the windows. Thus the inner side panels (one of which is visible, **1604**) have been removed and placed in front of the passengers to provide additional protection from the front. It will be noted that the panels at the rear of each passenger can be hinged together (using hinges 1603) and further manipulated during any manouvres that may be initiated during a threatening or live fire situation.

It is well within the scope of the invention that a further drop – down ballistic panel may be mounted in front and above the driver in a similar position to the sunscreen. In a dangerous situation the panel may be pulled down, protecting the front of the driver. Furthermore, embodiments of the invention are provided wherein the aforementioned drop down panel is constructed in a concertina like manner and unfolds to provide cover and protection for the whole front of the driver position, with a slit window at eye level . Further embodiments of the invention provide similar drop- down panels for the front passenger side. The aforementioned drop-down panels may be hung from any existing sun shield, or pre attached to a similar position. The lower ends may be optionally anchored in place to locations on the driver's seat by means of straps and/or elastic bands.

It is within provision of the invention that the ballistic material of the panels of the device be upholstered and/or otherwise covered with fabric or material to provide a professional-looking surface that matches a given car interior or in generally provides an attractive appearance in consonance with a luxury car interior.

It is within provision of the invention that several levels of protection be provided by making the panels of different materials, to allow for different end uses. The following indicates the various protection levels, materials, and illustrative panel weights for different protection levels.

NIJ Protection Level	*Panel Ballistic Material*	*Weight*
NIJ Level III-A	Kevlar®	7
NIJ Level III	Dyneema® / polyethylene	24
NIJ Level IV	Dyneema®, Kevlar® Dyneema®+Ceramic, Kevlar®+Ceramic	33

Table II - N.I.J. Protection Levels and Materials

From the table one sees that protection levels up to NIJ level IV may be provided at a reasonable total weight of 33kg, with correspondingly smaller weights for lower protection levels.

It is within provision of the invention that several panels may be stacked and carried, either by allowing for attachment between stacked panels, or by provision of a carrying sack. Either the panels or carrying sack are preferentially provided with carrying straps to allow a footsoldier to carry said panels easily.

It is within provision of the invention that panels are provided which may be easily worn on the back , attached by straps 'rucksack" style, so that a wearer may run or move while being protected from ballistic projectiles from behind.

It is within provision of the invention that a plurality of the panels of the device may be linked together to form a long protective barrier. This may be of use for example for riot police who must form a 'human wall' to prevent rioters from progressing.

It is within provision of the invention to provide a ballistic grade window in one or more of said side panels.

It is within provision of the invention to use attachment means selected from a group consisting of: hinges, Velcro, magnets, clasps, and hooks.

It is within provision of the invention wherein said side and back panels may be detached or attached to one another rapidly, within a time period of about five seconds.

It is within provision of the invention wherein said panels may be used as personal shields.

It is within provision of the invention wherein a plurality of said personal shields may be linked together to form a protective barrier.

It is within provision of the invention said panels are composed of materials selected from a group consisting of: Kevlar®, Dyneema®, polyethylene, ceramic, and combinations thereof.

It is within provision of the invention said panels are encased within a cosmetically appealing cover.

It is within provision of the invention to provide with a carrying case.

It is within provision of the invention said panels are adapted to fit within any motor vehicle passenger or driver space.

It is within provision of the invention said motor vehicle is selected from a group comprising automobile, lorry, truck, jeep, ambulance, earth-moving vehicle, construction vehicle, demolition vehicle, bulldozer, plough, harvester, mine-sweeper, armored vehicle, tank, personnel carrier, tractor, crane, taxi, limousine, bus, coach, train , locomotive, boat , ship, submarine other seagoing vessel, and aircraft.

It is within provision of the invention to additionally provide panels comprising ballistic materials adapted to rotate down from a location close to or on the drivers sunshield, thereby providing protection for the front passengers against ballistic attack from the direction of the front windshield.

It is within provision of the invention wherein said panels are concertina like and are adapted to drop down from a folded configuration to an extended configuration.

It is within provision of the invention wherein said panels are additionally provided with a window.

It is within provision of the invention wherein said ballistic material conforms to a recognized standard.

It is within provision of the invention wherein said standard is selected from a group consisting of NIJ Standard 0103.03 Level IIIA, Level III, or Level IV.

It is within provision of the invention wherein said panels are adapted to allow the passenger to utilize said motor vehicle's safety restraint system without modification thereof.

CLAIMS

1. In a motor vehicle, a system for personal ballistic protection comprising:

one or more side panels comprising ballistic material, and provided with handles and side attachment means;

one or more back panels comprising ballistic material, and provided with back attachment means adapted for removably mating with said side attachment means, said back panels being disposed perpendicular to and behind said side panels, and said back and side panels being adapted to be placed within a motor vehicle;

wherein said side panels and said back panels form a modular protective shell around a passenger or driver of any motor vehicle without modification of said motor vehicle, providing protection from ballistic weapon fire and explosion.

2. The system of claim 1 additionally providing a ballistic grade window in one or more of said side panels.

3. The system of claim 1 wherein said attachment means are selected from a group consisting of: hinges, Velcro, magnets, clasps, and hooks.

4. The system of claim 1 wherein said side and back panels may be detached or attached to one another rapidly, within a time period of about five seconds.

5. The system of claim 1 wherein said panels may be used as personal shields.

6. The system of claim 1 wherein a plurality of said personal shields may be linked together to form a protective barrier.

7. The system of claim 1 wherein said panels are composed of materials selected from a group consisting of: Kevlar®, Dyneema®, polyethylene, ceramic, and combinations thereof.

8. The system of claim 1 wherein said panels are encased within a cosmetically appealing cover.

9. The system of claim 1 furthermore provided with a carrying case.

10. The system of claim 1 wherein said panels are adapted to fit within any motor vehicle passenger or driver space.

11. The system of claim 1 wherein said motor vehicle is selected from a group comprising automobile, lorry, truck, jeep, ambulance, earth-moving vehicle, construction vehicle, demolition vehicle, bulldozer, plough, harvester, mine-sweeper, armored vehicle, tank, personnel carrier, tractor, crane, taxi, limousine, bus, coach, train , locomotive, boat , ship, submarine other seagoing vessel, and aircraft.

12. The system of claim 1 additionally providing panels comprising ballistic materials adapted to rotate down from a location close to or on the drivers sunshield, thereby providing protection for the front passengers against ballistic attack from the direction of the front windshield.

13. The system of claim 12 wherein said panels are concertina like and are adapted to drop down from a folded configuration to an extended configuration.

14. The system of claim 12 wherein said panels are additionally provided with a window.

15. The system of claim 1 wherein said ballistic material conforms to a recognized standard.

16. The system of claim 15 wherein said standard is selected from a group consisting of NIJ Standard 0103.03 Level IIIA, Level III, or Level IV.

17. The system of claim 1 wherein said panels are adapted to allow the passenger to utilize said motor vehicle's safety restraint system without modification thereof.

18. In a motor vehicle, a method for personal ballistic protection comprising steps of:

providing one or more side panels comprising ballistic material, and providing said side panels with handles and side attachment means;

providing one or more back panels comprising ballistic material, and providing said back panels with back attachment means adapted for removably mating with said side attachment means,

placing said side and back panels within a motor vehicle, disposing said back panels perpendicular to and behind said side panels;

wherein said side panels and said back panels form a modular protective shell around a passenger or driver of any motor vehicle, without modification of said motor vehicle, protecting passengers from ballistic weapon fire and explosion by blocking and stopping incoming projectiles.

19. The method of claim 18 additionally providing a ballistic grade window in one or more of said side panels.

20. The method of claim 18 wherein said attachment means are selected from a group consisting of: hinges, Velcro, magnets, clasps, and hooks.

21. The method of claim 18 wherein said side and back panels may be detached or attached to one another rapidly, within a time period of about five seconds.

22. The method of claim 18 wherein said panels may be used as personal shields.

23. The method of claim 22 wherein a plurality of said personal shields may be linked together by means of said attachment means to form a protective barrier.

24. The method of claim 18 wherein said panels are composed of materials selected from a group consisting of: Kevlar®, Dyneema®, polyethylene ceramic, and combinations thereof.

25. The method of claim 18 wherein said panels are encased within a cosmetically appealing cover.

26. The method of claim 18 furthermore provided with a carrying case.

27. The method of claim 18 wherein said panels are adapted to fit within any motor vehicle passenger or driver space.

28. The method of claim 18 wherein said motor vehicle is selected from a group comprising automobile, lorry, truck, jeep, ambulance, earth-moving vehicle, construction vehicle, demolition vehicle, bulldozer, plough, harvester, mine-sweeper, armored vehicle, tank, personnel carrier, tractor, crane, taxi, limousine, bus, coach, train , locomotive, boat , ship, submarine other seagoing vessel, and aircraft.

29. The system of claim 18 additionally providing panels comprising ballistic materials adapted to rotate down from a location close to or on the drivers sunshield, thereby providing protection for the front passengers against ballistic attack from the direction of the front windshield.

30. The system of claim 29 wherein said panels are concertina like and are adapted to drop down from a folded configuration to an extended configuration.

31. The system of claim 29 wherein said panels are additionally provided with a window.

32. The system of claim 18 wherein said ballistic material conforms to a recognized standard.

33. The system of claim 32 wherein said standard is selected from a group consisting of NIJ Standard 0103.03 Level IIIA, Level III, or Level IV.

34. The system of claim 18 wherein said panels are adapted to allow the passenger to utilize said motor vehicle's safety restraint system without modification thereof.

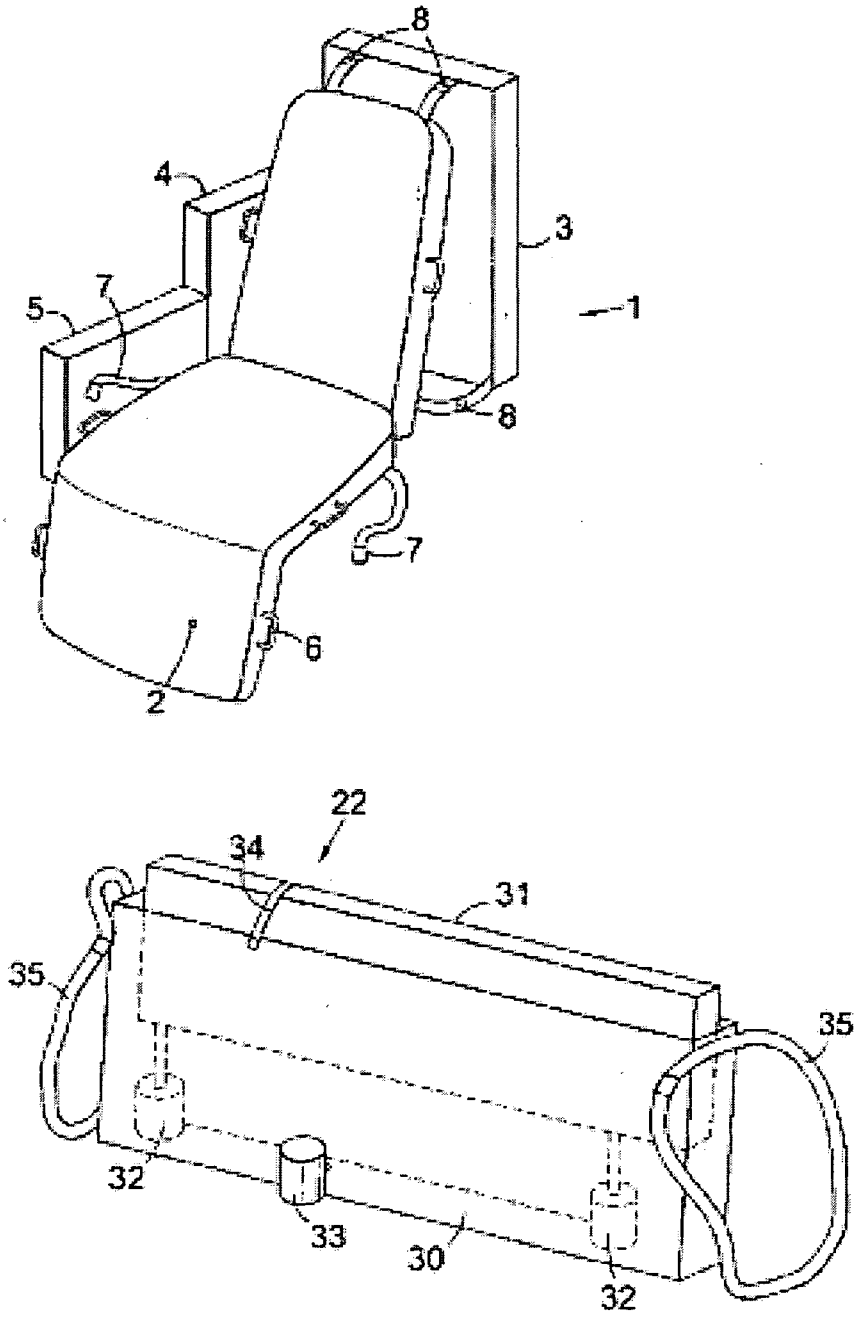


Fig. 1

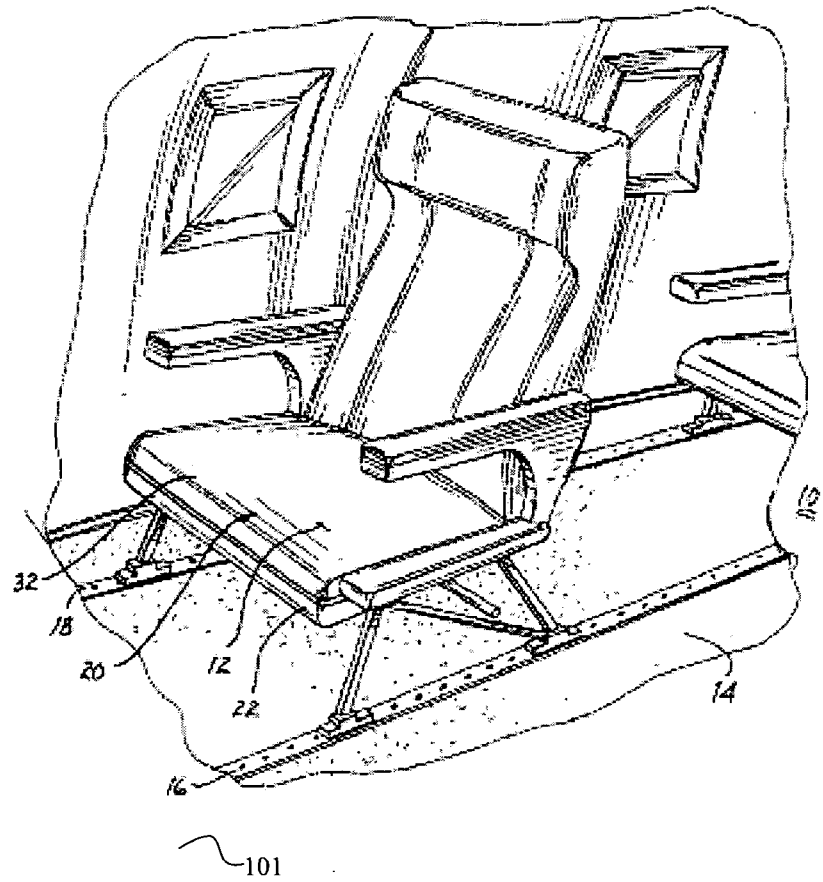


Fig. 2

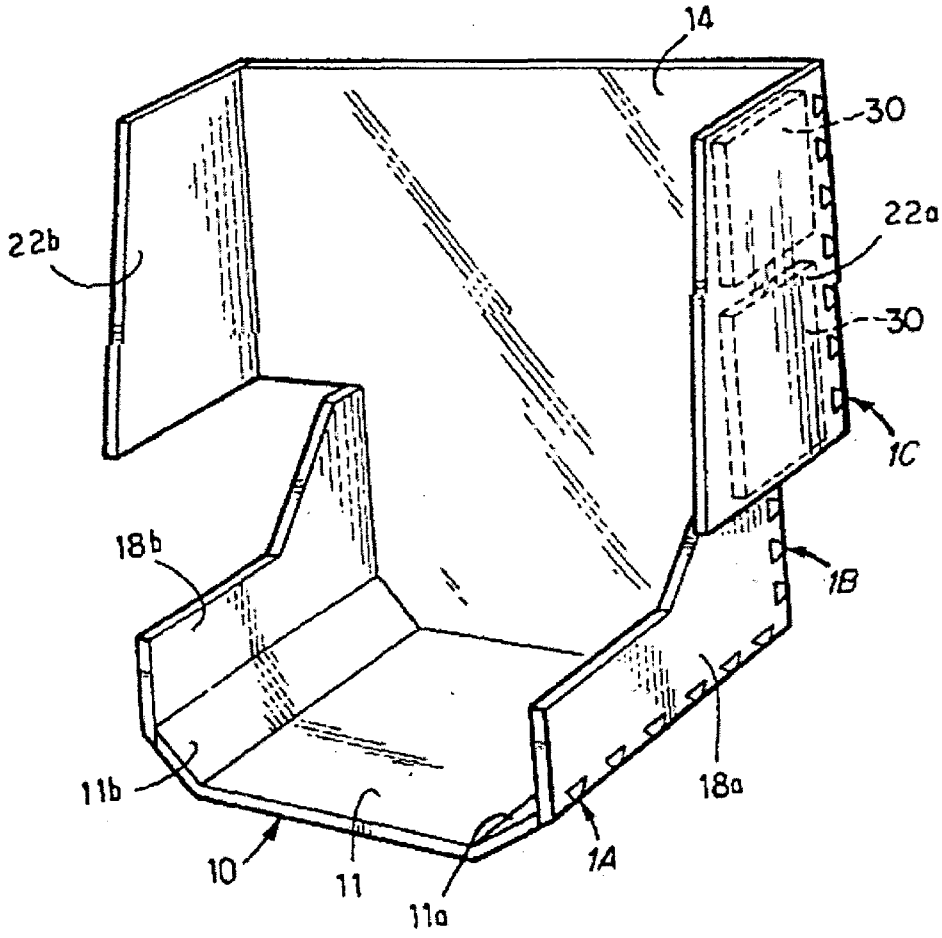


Fig. 3

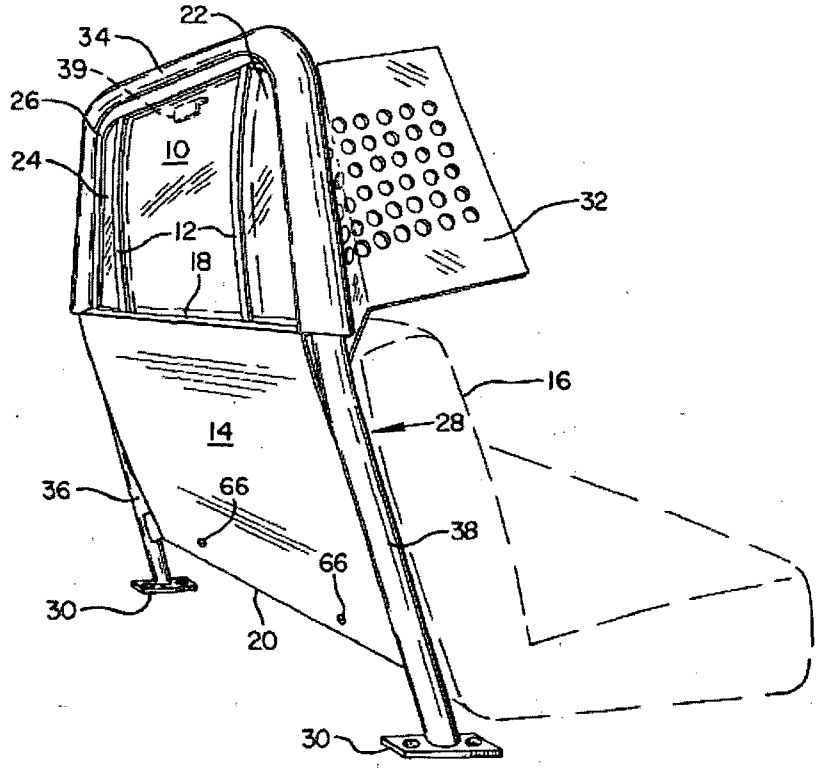


Fig. 4

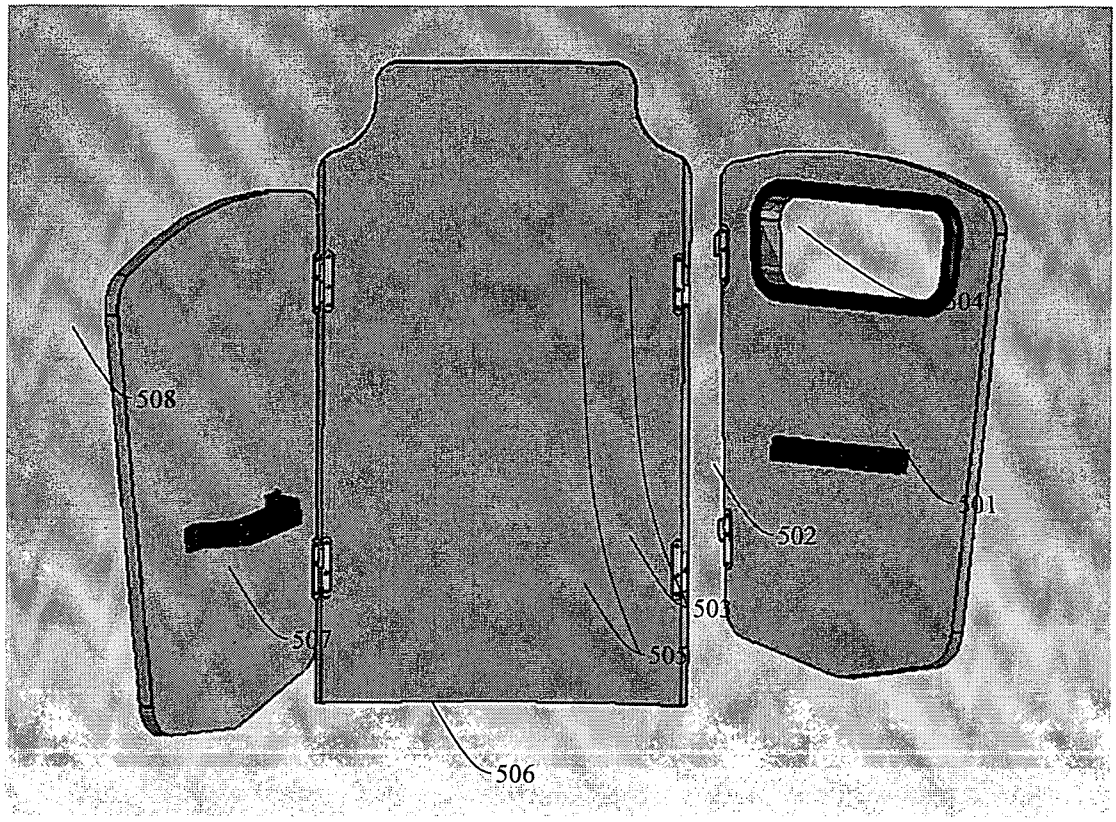


Fig. 5

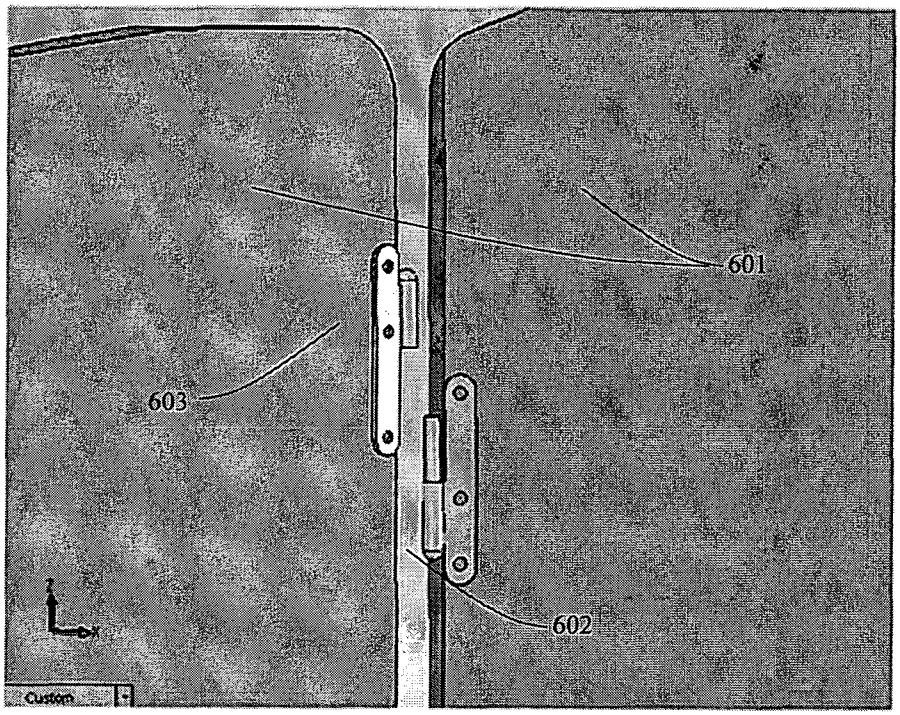


Fig. 6

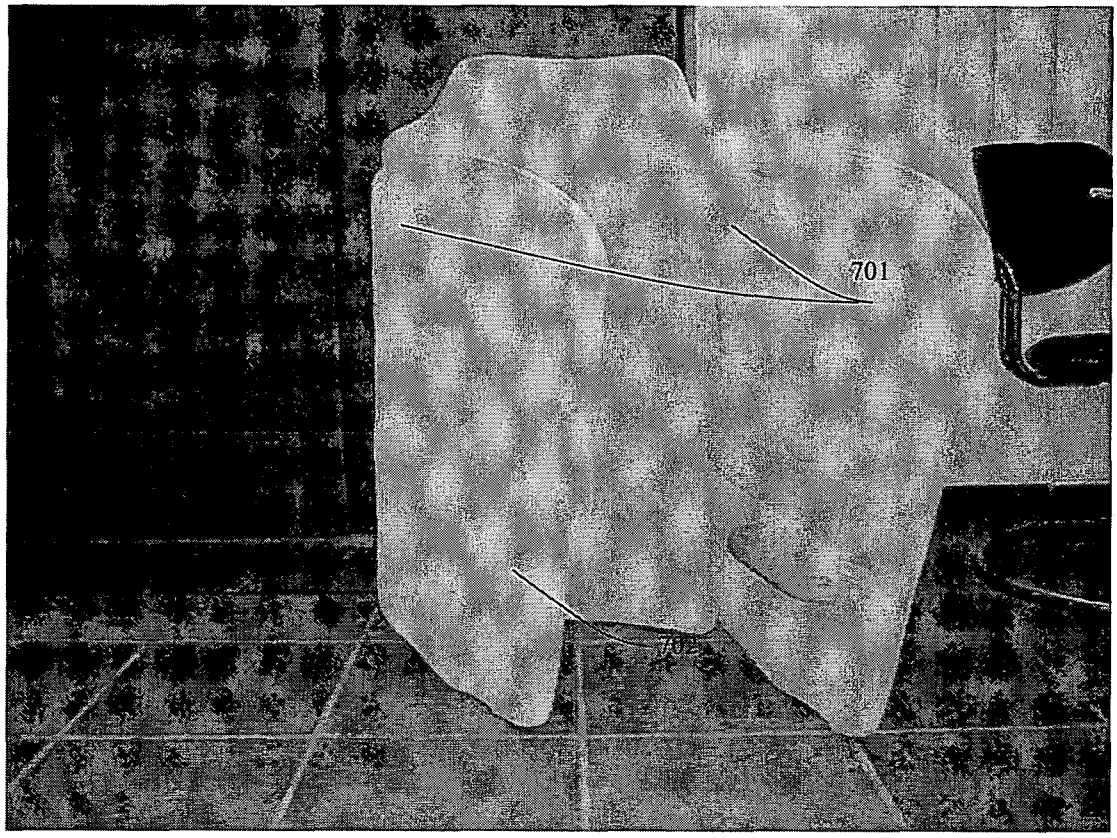


Fig. 7

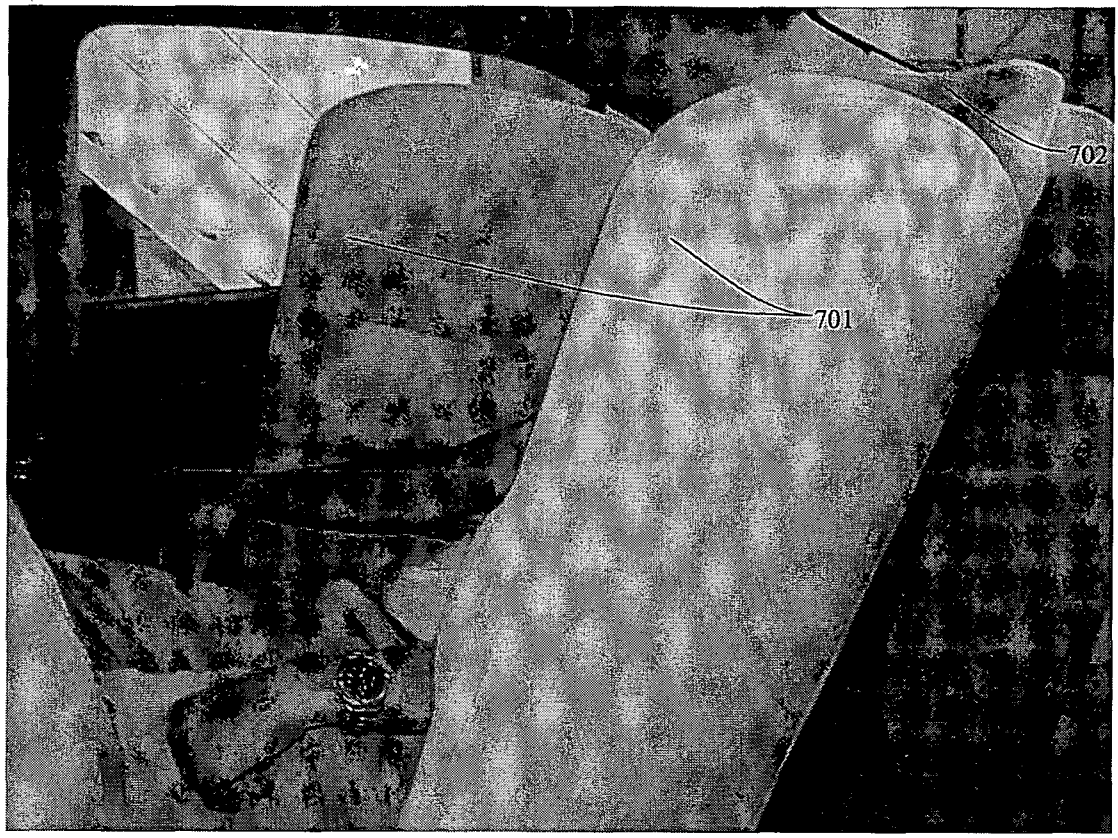


Fig. 8



Fig. 9



Fig. 10

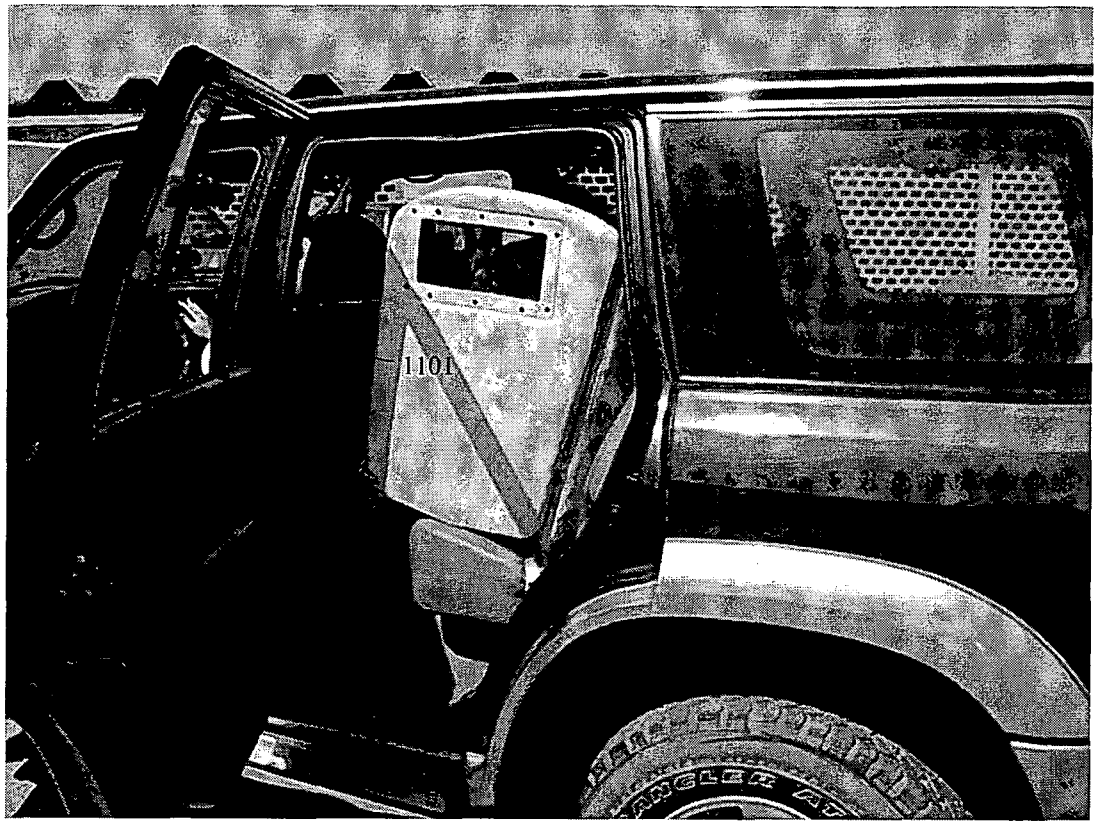


Fig. 11



Fig. 12



Fig. 13



Fig. 14

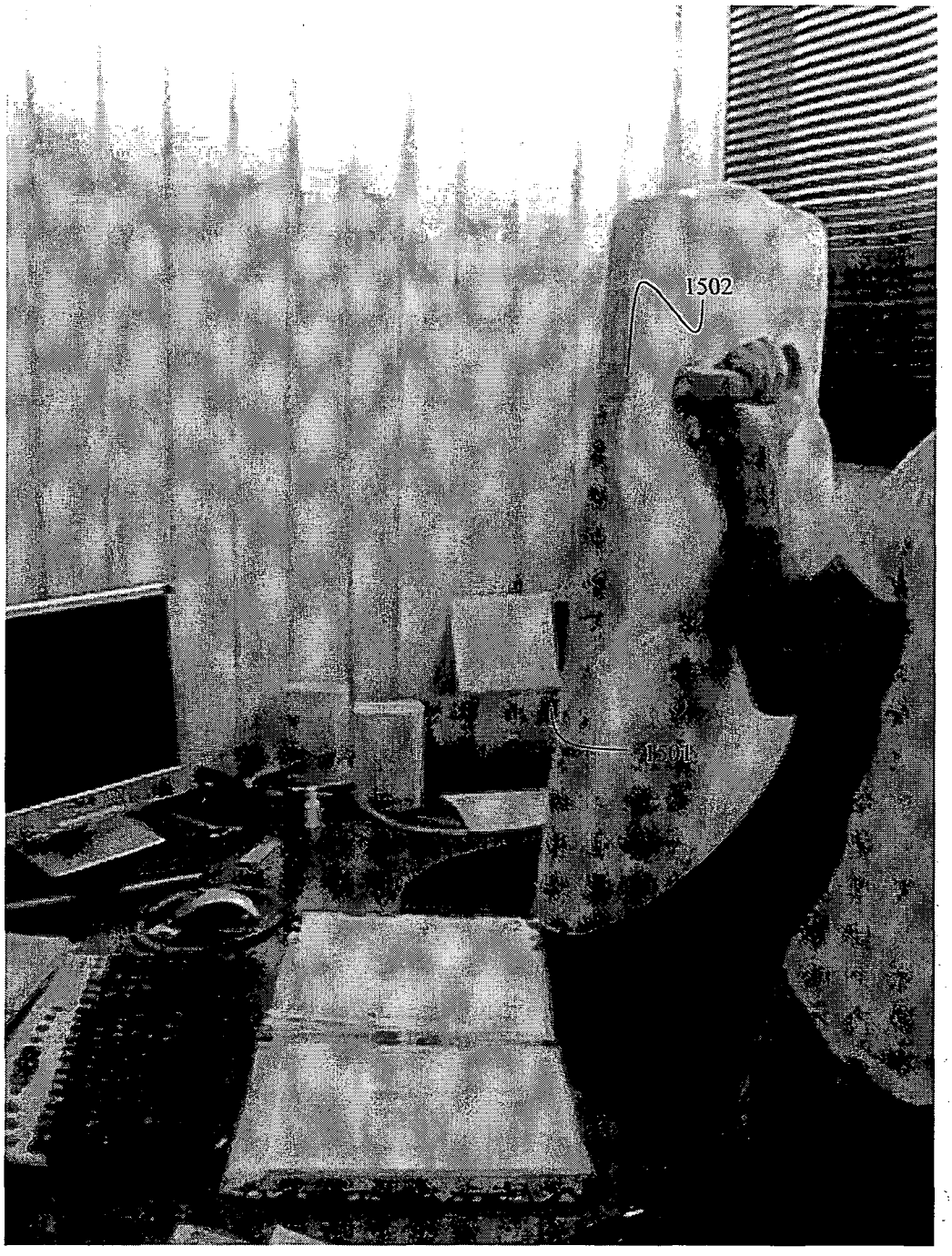


Fig. 15



Fig. 16