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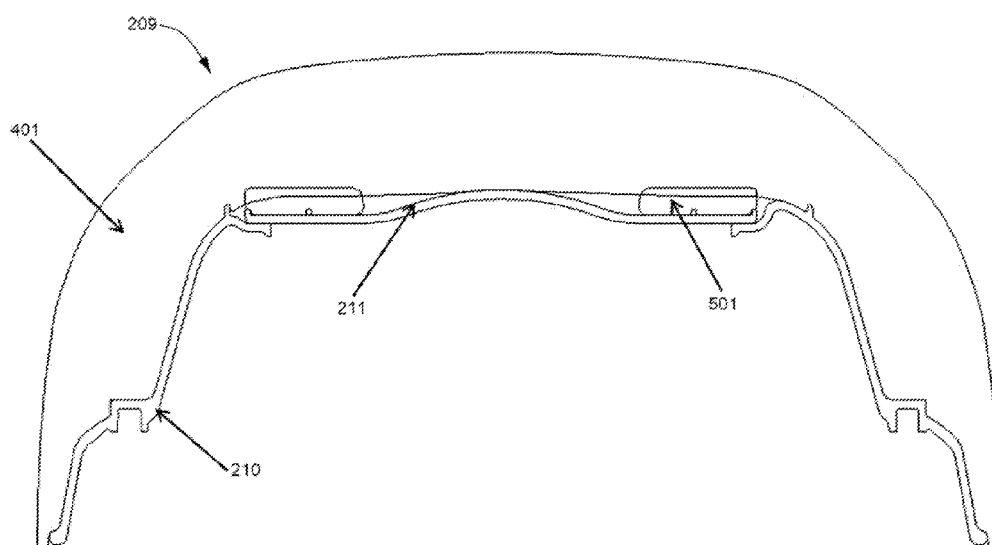


Fig. 5

(57) Abstract: The present invention relates to a saddle type vehicle (100) comprising a handlebar assembly (109) for steering said vehicle (100). A seat structure (110) is disposed rearwardly to the handlebar assembly (109). The seat structure (110) includes a seat base assembly (209). A storage member (206) is disposed under the seat structure (110). The storage member (206) is configured to accommodate one or more oversized article(s) (208). The seat base assembly (209) of the seat structure (110) comprising a fixed seat base portion (210) and a first seat cushion member (401). A movable seat base portion (211) being disposed between the fixed seat base portion (210) and the first seat cushion member (401). The movable seat base portion (211) is capable of moving when establishing a contact with said one or more oversized article(s) (208) accommodated within the storage member (206).



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A SADDLE TYPE VEHICLE AND A SEAT-STRUCTURE THEREOF

TECHNICAL FIELD

[0001] The present subject matter relates generally to a saddle type vehicle. More particularly but not exclusively, the present invention relates to a seat assembly for the saddle type vehicle.

BACKGROUND

[0002] Conventionally, vehicle layout design for a saddle type vehicle including a two or three-wheeled type vehicle features a step-through frame and a flat surface called as a floorboard assembly used for disposing legs of a rider during vehicle riding conditions. A seat assembly is disposed rearwardly to the floorboard assembly. Further, the saddle type vehicle features bodywork, including one or more body panels that conceal all or most of the vehicular mechanisms. Since, most of the parts in the saddle type vehicle is concealed by the body, the body parts are to be designed such that they fit into the body space achieving optimum utilization of space in the vehicle. Accordingly, a storage member is also concealed by one or more body panels, the storage member is disposed underneath the seat assembly, the seat assembly conceals the storage member from top side such that one or more articles of the user stored inside the storage member are protected. It is desirable by the user to have a sufficient storage space for storing his/her articles in the storage member. Therefore, having a storage member without compromising on the storage space is a critical factor.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] The detailed description is described with reference to an embodiment of a saddle type vehicle along with the accompanying figures. The same numbers are used throughout the drawings to reference like features and components.

[0004] **Fig. 1** shows a side view of an exemplary saddle-type vehicle.

[0005] **Fig. 2 (a)** illustrates a sectional side view of the saddle-type vehicle shown in Fig. 1, depicting a rear structure in accordance to an implementation of the present subject matter.

[0006] **Fig. 2 (b)** illustrates a sectional side view of the saddle-type vehicle shown in Fig. 1, depicting a rear structure with helmet in accordance to an implementation of the present subject matter.

[0007] **Fig. 2 (c)** illustrates a sectional side view of the saddle-type vehicle shown in Fig. 1, depicting a rear structure with helmet disposed underneath a seat structure in accordance to an implementation of the present subject matter.

[0008] **Fig. 3 (a) – 3 (d)** illustrates cross-sectional view(s) of a rear structure of a conventional saddle-type vehicle.

[0009] **Fig. 4 (a) – 4 (d)** illustrates a cross-sectional view(s) of a rear structure of a saddle-type vehicle shown in Fig.1, in accordance to an implementation of the present subject matter.

[00010] **Fig. 5** illustrates a sectional rear view taken along line A-A of Fig. 4 (a) depicting a seat base assembly in accordance to a second embodiment of the present subject matter.

[00011] **Fig. 6** illustrates a characteristic curve depicting locking force against interference for a seat base assembly in accordance to an implementation of the present subject matter.

[00012] **Fig. 7** illustrates a perspective top view of a seat structure of a saddle-type vehicle, in accordance to a third embodiment of the present subject matter.

[00013] **Fig. 8** illustrates a sectional side view of a rear structure of a saddle-type vehicle, in accordance to a fourth embodiment of the present subject matter.

[00014] **FIG. 9** illustrates a sectional side view of a seat base assembly of a saddle-type vehicle, in accordance to an implementation of the present subject matter.

DETAILED DESCRIPTION

[00015] Generally, the under-seat space is used to package one or more vehicular parts including the storage member for use by the user. The user can store his/her articles like gloves, bags, helmets and the like while riding the vehicle inside the storage member. The seat structure is used by a rider and a pillion rider to ride a vehicle. The seat structure and the storage member should be able to take the load exerted on them due to the weight of the rider and the pillion rider. Further, during vehicle riding conditions, while traversing on rough roads, the storage member in close contact with the seat assembly is subject to lot of vibrations and other unwanted effects. During such conditions, the storage member might be subject to unexpected or accidental damages e.g. overloading, oversized parts forced into the storage space etc. Such unexpected

damages may lead to improper supporting of the seat structure above the storage member. The unevenly laid seat on the damaged storage member may subject the user of the vehicle to undesirable discomfort and may also lead to fatigue / stress for the user if ridden on the vehicle for a long distance and for a long duration of time.

[00016] Further, the phenomenon of bending of the seat structure occurs due to uneven laid seat on an uneven surface of the storage member which in turn is due to unexpected damages to various portions of the storage member. In addition, the phenomenon of seat bending occurs due to overloading of the storage member as well. The overloading of the storage member occurs for instance, if the article used by the user, say, a helmet, being bigger in size is dumped into the storage member and covered forcibly by the seat assembly by the user. The user seated on the forcibly closed seat assembly is exerting load on the seat structure. The load so exerted is unevenly distributed all over the seat structure and the various portions of the storage member. Over the due course of usage of forcibly closed seat structure with bigger articles, like a bigger helmet in the storage member, the seat structure undergoes bending gradually, leading to undesirable seat contact pressure causing undesirable discomfort to the user. Furthermore, the bending of the seat structure also leads to breakage of the seat structure. In particular, a seat base member of the seat structure suffers from breakage or crack leading to poor durability, life & high cost of maintenance. The so bent seat structure also causes breakage of the storage member, which might cause damage to the surround vehicular parts, noise irritation as well as serious damages to critical vehicular parts like a powertrain assembly that are disposed underneath the storage member.

[00017] There may also occur a situation over a period of time, wherein closure of the seat structure above the storage member becomes impossible due to the phenomenon of bending of the seat base of the seat structure. The rider has to necessarily compromise on his necessity of using the vehicle under such circumstances.

[00018] However, the capacity of the storage member can be increased to facilitate accommodating of the articles including bigger helmets of the rider. But, the storage member with a bigger capacity comes with its own disadvantages of having to compromise on packaging of other surrounding vehicular parts, increase in size of the vehicle, in particular, increase in width of the vehicle making the vehicle look bulkier and aesthetically unappealing. Therefore, it

is not desirable to have a bigger storage member. Any increase in height of the storage structure can lead to undesirable increase in seat height & thereby poor ground reach for the rider. Increasing height of storage structure in downward direction leads to packaging space constraint for the powertrain of the vehicle in addition to undesirable compromise on ground clearance. Similarly, any increase in lateral width of storage space leads to poor ergonomics as pillion will have to stretch & seat in an uncomfortable manner in addition to poor maneuverability of vehicle in traffic conditions.

[00019] Further, to prevent the breakage of the seat structure, the seat base member of the seat structure can be made of a stronger material by providing number of material deposition to locally strengthen the seat base member, however, rigid materials are more prone to breakage, increase weight / cost therefore, making the seat base member stronger does not provide a better solution and hence is undesirable. Also, any increase in stiffness of the structure adversely affects the compliance of the seat structure leading to poor seating / cushioning comfort & hard shocks or bumpy ride for the user. Additionally, any compromise on the seat foam thickness is also highly undesirable for similar reasons. From usage point of view, the user prefers to have maximum utility / storage space which puts a stiff challenge on the layout & packaging to design a compact vehicle with maximum storage space. Additionally, the usage of the storage space from the user tends to be random with maximum space utilization being sporadic & not all the time. Similarly, if an article like a helmet is to be stored, the space required varies based on the size of the helmet used by the rider. Thus, providing an exceedingly large space to cater to all such variance in requirements severely compromises on the compact design of the vehicle.

[00020] One of the major requirements in any saddle type vehicle is to accommodate helmets of various sizes, shapes and configurations within the storage member or the utility box. The challenges related to this requirement are even higher, when there seems to be any modification in the layout of the power unit lying beneath the utility box. For instance, there is a possibility of the power unit growing vertically in case of any additional components being added to the power unit. Under such circumstances, there seems to be an immediate design constraint in terms of the design of the utility box to accommodate helmets and other similarly oversized articles therewithin.

[00021] Typically, in saddle type vehicles, a relief is made in the bottom surface of the utility box for accommodating the extended parts of the power units and to comfortably accommodate article like a helmet above the relief. However, such modification only increases the cost and amounts to overall change in design of the utility box apart from reducing the volume of the utility box.

[00022] Further, the forces acting on the hinge point of the seat base also tends to increase due to increase in the application of the locking force at the other end of the seat base. Such an increase in the force acting on the hinge point due to the increase in the application of the locking force at the other end of the seat base, affects the durability of the seat base over a period.

[00023] Moreover, an increase in the vertical height of the power unit tends to reduce the overall volume including the height of the utility box in an effort to compensate the overall vertical height of the vehicle. Further, it is least advisable to increase the overall height of the vehicle as any such increase tends to have a negative impact on the ride and feel of the user of the vehicle leading to discomfort in overall vehicle handling.

[00024] In case the height of the seat base is increased so as to not to compensate in the storage volume of the utility box, there is an immediate impact on the ground reachability of the rider in seated condition, especially when the vehicle is in stable condition and not running, which again has a negative impact on ride handling of the vehicle. Further, reducing the storage volume of the utility box also impacts the height between the seat base and the utility box, which gets reduced and negatively impacts the comfort of the rider, as the reduction in thickness of the seat foam, for example, causes discomfort to rider, when the vehicle is driven for longer durations.

[00025] In order to address the problem with respect to increase in the vertical height of the powertrain, one of the known solutions are to provide a hump portion in the bottom surface of the utility box, which is capable of accommodating the vertically extending portion of the powertrain. However, even such an attempt leads to reduction in overall available volume of the utility box.

[00026] Therefore, there exists a need to have an improved seat structure that overcomes the above stated problems of the prior art and other problems of known art.

[00027] To this end, the present invention is aimed at solving the problems with respect to the prior arts and known vehicles that are described above. In this regard, the present invention provides a seat structure having a seat base assembly. The seat base assembly of the present invention includes a fixed seat base portion and a movable seat base portion. In an implementation, the movable seat base portion of the present invention is formed separately from the fixed seat base portion.

[00028] Typically, articles such as an oversized helmet is kept inside the storage member or the utility box when the rider is not using it, i.e., when the vehicle is not in running condition. Thus, the present invention provides a seat structure, which has an optimal overall thickness of the seat base assembly, which ensures that the helmet is comfortably stored during the non-running condition of the vehicle with the help of the movable seat base portion of the present invention. On the other hand, when the vehicle is in running condition, the movable seat base portion of the present invention is capable of retaining its original condition; thus, the seat base assembly of the present invention does not negatively impact the comfort of the rider during vehicle running condition.

[00029] Moreover, there is also a requirement that different variety of helmet, meaning helmet of different size should be comfortably placed in the utility box, without permanently receding the volume of the utility box and without creating forces to act on the seat base surface by forcefully locking the seat with the top surface of the helmet impinging on the seat base, which leads to the failure of the seat base, which over a period, has a negative effect on the strength of the seat base.

[00030] In furtherance, the movable seat base portion ensures that deflection happens only in one direction, i.e., in the direction towards the seat base and not away from it. Thus, this solution has a technical advantage over the other known solutions, which provides locally formed flexible deflecting members on the bottom surface of the seat base, which over a period, deteriorates the strength of the seat base.

[00031] Furthermore, the present invention is also aimed at overcoming challenges faced while adapting the seat structure with the movable seat base portion as per the present invention, for instance, when the helmet comes into direct contact with a cushion member of the seat base assembly, for example, a poly urethane (PU) foam. This is because, in such a design, in which

the helmet comes into direct contact with the PU foam of the seat base assembly, an adverse effect on the locking force to be applied by the user for locking the seat after accommodating the helmet in the storage member exists. For example, in one implementation, in order to achieve a deflection ranging between 6 mm to 10 mm of the seat base assembly, which is the approximate deflection required to compensate the interference between the seat base assembly and the top surface of the helmet, an approximate locking force of 8 to 12 kgf has to be applied by the user while locking the seat base assembly, even in case of seat bases having a floating or a movable seat base portion. On the other hand, in cases, where there exists no interference between the seat base and the top surface of the helmet, an approximate locking force of 2 to 5 kgf is sufficient to be applied by the user, while locking the seat base assembly.

[00032] Thus, the present subject matter is also aimed at enabling the user an optimal seat base assembly, which does not unduly increase the locking forces that are to be applied while locking the seat base assembly. For instance, in an implementation, the present invention provides a second seat cushion member, for instance, a variable density PU-foam between the movable seat base portion and the first seat cushion member. In one embodiment, the second seat cushion member is a separate part from the first seat cushion member. In another embodiment, both the seat cushion members can be integrated, for instance by pasting or suitable attaching means.

[00033] Furthermore, the present invention is also aimed at solving problems associated with the seat base assembly of the present invention. For instance, the separate movable seat base portion that is provided on the seat base can encounter rattling or wobbling during vehicle running, especially, when the helmet is not placed within the utility box. Thus, the multi-directional movement of the movable seat base portion tends to cause noise and vibration. To overcome this problem, the present subject matter provides an elastomeric member between the movable seat base portion and the fixed seat base portion. This elastomeric member, in an embodiment, can be made of rubber. In an embodiment, this elastomeric member can be enmolded. In another embodiment, this part can be either sealed or pasted either to the movable seat base portion or to the fixed seat base portion.

[00034] In an implementation, the present invention is also aimed at overcoming the problems associated with the contact established between the movable seat base portion and the helmet. For instance, hard point to hard point contact during riding on bumpy roads, leads to rattling

noise, both when the helmet is placed within the utility box and when it is not placed. Further, though the seat base assembly of the present invention provides enough clearance, there can still be a squeeze noise emanating from the sides of the contact zones of the movable seat base portion and the fixed seat base portion. In an embodiment, the present invention is aimed at overcoming such squeeze noise problems.

[00035] Further, in an implementation, the present invention is aimed at reducing the locking force of the seat base assembly. For instance, the second seat cushion member, i.e., the variable density PU foam of the present invention is optimally disposed in zones wherever the movable seat base portion comes into contact with the fixed seat base portion. In another embodiment, the variable density PU foam is also disposed between the movable seat base portion and the first seat cushion member.

[00036] In an implementation, the present subject matter is also aimed at providing shape optimization, such that when helmet is placed in the utility box, a minimum area of contact is established between the movable part of the seat base and the top surface of the helmet. Further, the elastomeric member of the present invention is provided to insulate noise and vibration that emanates between the movable part and the fixed part of the seat base assembly. In an alternative embodiment, the shape optimization of the movable part is achieved such that an additional helmet can be accommodated within the storage member of the vehicle.

[00037] In one embodiment, the bottom surface of the storage member is a flat surface that is capable of comfortably storing helmet of varying shape and size, in addition to other articles. The movable part of the seat base provided along with the variable density foam ensures that the utility box volume is not reduced in order to accommodate an powertrain assembly with a greater vertical height underneath the utility box. Further, the present subject matter also ensures that the storage articles, for example, helmet is accommodated comfortably without causing failure to the seat base. The present subject matter ensures that helmet of large anthropometric range of size and shape can be accommodated without causing failure to the seat base. The present subject matter also ensures that the overall height of the seat base is not increased, such that the rider is able to comfortably maneuver the vehicle in low speed conditions and during stand-still conditions. Further, the present subject matter also ensures that the thickness of the seat foam is

not reduced or compromised for the sake of accommodating the helmet and for the purpose of reducing the locking force imparted by the rider.

[00038] In an implementation, the variable density foam provided between the movable part and the rigid part of the seat base assembly of the present subject matter, also ensures that the hinge joint of the seat base, which is at the other end of the seat base assembly closer to the handlebar assembly, does not fail due to multiple operations involving application of seat locking force with the helmet or any large object accommodated within the storage member.

[00039] In an alternative embodiment, the present subject matter provides a slidable seat base portion in place of the movable seat base portion. Similar to the movable seat base portion, the slidable seat base portion is configured to slide in a vehicle longitudinal or a vehicle transverse direction, whenever contact with the top surface of the helmet is established by closing the seat base and due to application of seat locking force. In an embodiment, the slidable seat base portion is provided as a separate member from the fixed seat base portion, and is separated by the variable density PU foam that is provided therebetween. For instance, the seat base portion can be made to slide in one of vehicle longitudinal or vehicle lateral directions by application of force on the slidable seat base portion. The sliding force can be applied mechanically using one or more spring means, or electrically using a stepper motor.

[00040] In case of both the movable and the slidable seat base portions, a variable density foam is provided between the fixed seat base portion and the movable/slidable seat base portion, such that the problems caused due to locking force, rattling noise and vibrations are advantageously overcome.

[00041] The detailed description of the invention with respect to an embodiment of a scooter type motorcycle with the figures is as follows.

[00042] Fig. 1 shows a left side perspective view of the two-wheeled type vehicle. The vehicle has a body frame assembly made up of several tubes welded together which usually supports the body of the said vehicle. The vehicle has a steerable front wheel 101 and a driven rear wheel 102. The body frame assembly (represented schematically in illustration by dotted lines) of the vehicle is an elongated structure, which typically extends from a forward end to a rearward end of the vehicle. The said frame assembly includes a head tube 104, a main frame 111 and also

may have a sub-frame. The sub-frame is attached to the main frame using appropriate joining mechanism. The frame assembly is covered by a plurality of vehicle body covers including a front panel 103, a rear cover (not shown), a left front bottom panel 105, and a side panel 106.

[00043] A handlebar assembly 109 and a seat structure 110 are supported at opposing ends of the frame assembly and a generally open area is defined there between known as a floorboard 108 which functions as a step through space. The seat for a driver and a pillion is placed forward to a fuel tank and rear side of floorboard 108. A front fender 107 is provided above the front wheel 101 to avoid the vehicle 100 and its occupants from being splashed with mud. Likewise, a rear fender 112 is placed between fuel tank (not shown) and the rear wheel 102, and to the outer side in the radial direction of the rear wheel 102. The rear fender 112 inhibits rain water or the like from being thrown up by the rear wheel 102. A front cover assembly 115 is disposed rearwardly to the floorboard 108.

[00044] Suspensions are provided for comfortable steering of the vehicle on the road. A front suspension assembly is connected to a front fork 118. The rear suspension assembly comprises of at least one rear suspension 117 preferably on the left side of the vehicle. However, a vehicle with two rear suspensions, namely on the left side and the right side is also possible. For the safety of the user and in conformance with the traffic rules, a headlamp assembly 116 in the front portion of the vehicle and a taillight 113 in the rear portion of the vehicle is also provided.

[00045] Fig. 2 (a) illustrates a sectional side view of the saddle-type vehicle shown in Fig. 1, depicting a rear structure in accordance to an implementation of the present subject matter. In an embodiment, the rear structure 201 of the saddle-type vehicle 100 includes a power unit 202, for instance, an internal combustion engine 202 disposed underneath a storage member 206 of the rear structure 201. In an implementation, the engine 202 has a front end 204 disposed substantially below a front end of the storage member 206, and a rear end 205 of the engine 202 being disposed substantially below a rear end of the storage member 206. Further, in one implementation, the engine 202 includes a topmost portion 203 disposed vertically juxtaposing a bottom surface 207 of the storage member 206. In an implementation, the bottom surface 207 of the storage member 206 is a flat surface. In an alternative implementation, the bottom surface 207 of the storage member 206 is a non-planar surface having a substantial projection or a hump on its surface. Keeping the bottom surface 207 of the storage member 206 flat, ensures that the

overall volume of the storage box 206 can be increased and can accommodate multiple articles including any oversized article such as a helmet (not shown in this figure). Moreover, this invention is aimed at ensuring that there is no interference between the topmost portion 203 of the engine 202 and the flat bottom surface 207 of the storage member 206, even though both of them are so close and juxtaposing to each other.

[00046] Fig. 2 (b) illustrates a sectional side view of the saddle-type vehicle shown in Fig. 1, depicting a rear structure 201 with an over-sized article 208, for example, a helmet 208, in accordance to an implementation of the present subject matter. In an embodiment, a bottom portion of the helmet 208 is comfortably positioned on the bottom surface 207 of the storage member 206. However, a top portion of the helmet 208 is seen extending vertically upward beyond the storage member 206 and into a seat structure (not shown in this figure), which is configured to cover the top region of the storage member 206.

[00047] Fig. 2 (c) illustrates a sectional side view of the saddle-type vehicle 100 shown in Fig. 1, depicting a rear structure 201 with helmet 208 disposed underneath a seat structure 110 in accordance to an implementation of the present subject matter. In an embodiment, the seat structure 110 of the present invention includes a seat base assembly 209 disposed above the storage member 206 of the vehicle 100. The seat base assembly 209 of the present invention includes a fixed seat base portion 210 and a movable seat base portion 211. The seat base assembly 209 extends longitudinally in a vehicle length-wise direction having a front end closer to the handlebar assembly 109 of the vehicle 100. In an embodiment, the front end of the seat base assembly 209 is a hinged end 212, which enables opening and closing of the seat base assembly 209 over the storage member 206. The hinged end 212 ensures that the seat base assembly 209 rotates in anti-clock wise direction for opening the seat structure 110 and accessing the underlying articles, including the helmet 208. The hinged end 212 is provided with suitable mechanism that allows comfortable opening and closing of the seat base assembly 209. In an embodiment, the rotation of the seat base assembly 209 in clock-wise direction about the hinged end 212 enables closing of the seat base assembly 209. In an embodiment, closing of the seat base assembly 209 about the hinged end 212 with helmet 208 lying underneath, involves application of increased locking force on account of interference between the top portion of the helmet 208 and the seat base assembly 209. The amount of locking forces being exerted to close

the seat base assembly 209 is proportional to the extent of interference between the helmet 208 and the seat base assembly 209, i.e., the more the interference, the higher is the locking forces that are required to be applied in a direction 214, against the direction of interference. Further, the higher the interference, the forces acting against the bottom surface of the seat base assembly 209 also increases proportionately, which has a negative impact on the durability & life of the seat base assembly 209. In an embodiment, the movable seat base portion 211 of the seat base assembly 209 of the present invention enables overcoming the problems associated with the increase in interference between the top surface of the helmet 208 and the seat base assembly 209, while closing the seat base assembly 209 about the hinged end 212.

[00048] In an embodiment, movable seat base portion 211 is detachably attached to the fixed seat base portion 210 of the seat base assembly 209. For instance, the movable seat base portion 211 is disposed in such a manner that it can move vertically upward from its initial position when establishing a contact with the top portion of the helmet 208. In an embodiment, the movable seat base portion 211 is additionally provided with a convex profile corresponding to the concave surface of the top portion of the helmet 208, such that the top portion of the helmet 208 is comfortably accommodated within the convex surface of the movable seat base portion 211. The upward vertical transition of the movable seat base portion 211 when establishing contact with the top portion of the helmet 208 ensures that the locking forces applied on the locking end 213 of the seat base assembly 209 due to the interference between the top portion of the helmet 208 and the movable seat base portion 211 is largely reduced. Such a construction of the movable seat base portion 208 ensures that the overall storage volume of the storage member 206 is not reduced in order to accommodate an oversized article such as the helmet 208. Further, the thickness of the seat base assembly 209 is also not compensated for the sake of storage volume especially during parked stored condition of the vehicle. The movable seat base assembly 211 of the present invention also ensures that the overall height of the vehicle 100 is not unnecessarily increased in order not to compensate the seat base thickness and the storage volume & being abutted against the seat foam, the movable seat base member 211 pushes gently against the foam material thereby ensuring a secure & stable positioning even in a moved condition.

[00049] Fig. 3 (a) – 3 (d) illustrates cross-sectional view(s) of a rear structure of a conventional saddle-type vehicle. A conventional seat base assembly 301 as shown in Fig. 3 (a) includes a seat base member 303 provided with a seat cushion 302. The seat base member 303 of the conventional seat base assembly 301 is disposed above a utility box 304. As shown in Fig. 3 (b), the original seat cushion thickness 307 is considered to extend vertically upward from the seat base member 303 to the top end of the seat cushion 302. Further, as seen in Fig. 3 (c), when a helmet 208 is located within the utility box 304, the top portion of the helmet 208 tends to impinge on the bottom portion of the seat base member 303, thereby causing distress on the seat base member 303 and the seat cushion 302, which in turn causes discomfort to the rider. Such an increased interference, as can be seen from the interfering portion 305 of the helmet 208, leads to affect the strength of the seat base member 303. Moreover, as seen in Fig. 3 (d), the original seat cushion thickness 307 tends to reduce due to the placement of the helmet 208 within the utility box 304 and now becomes reduced thickness 308 of the seat cushion 302. Alternatively, if the compliance of the seat assembly is low, the seat top surface gets raised resulting in undesirable increase in seating height of the vehicle.

[00050] Fig. 4 (a) – 4 (d) illustrates a cross-sectional view(s) of a rear structure of a saddle-type vehicle shown in Fig.1, in accordance to an implementation of the present subject matter. As can be seen in Fig. 4 (a), the seat base assembly 209 of the present invention is provided with a first seat cushion member 401 extending longitudinally above the fixed seat base member 210 of the seat base assembly 209. In a second embodiment, the seat base assembly 209 of the present invention is provided with a second seat cushion member (Shown in Fig.5) in addition to the first seat cushion member 401. The second seat cushion member helps in increasing the overall comfort of the seat base assembly 209. For instance, the second seat cushion member helps in eliminating clattering noise emanated due to the vertical movement of the movable seat base portion 211. Further, the second seat cushion member also helps in preventing dislocation of the movable seat base portion 211 due to frequent upward vertical movement caused due to the interference created with the top portion of the helmet 208 as seen in Fig. 4 (c). Further, as can be seen in Fig. 4 (b) and Fig. 4 (d), the first thickness 403 of the seat base assembly 209 taken from the top end of the movable seat portion 211 and the top most end of the first seat cushion member 401, in a condition when there is no interference between the top portion of the helmet

208 and the movable seat base portion 211, is substantially equal to the second thickness 404 when there is an interference between the top portion of the helmet 208 and the movable seat base portion 211. Thus, in an embodiment, the movable seat base portion 211 with and without the second seat cushion member ensures that the thickness of the seat base assembly 209 & the cushioning property of the seat is not affected due to the interference created by the top portion of the helmet 208 with the movable seat base portion 211. As per another aspect of the present invention, the cushion can get compressed within the space thereby increasing its density, which effectively ensures good load carrying capacity as well as cushioning of the seat assembly even when an oversized article is placed.

[00051] Fig. 5 illustrates a sectional rear view taken along line A-A of Fig. 4 (a) depicting the seat base assembly 209 in accordance to a second embodiment of the present subject matter. In accordance with the second embodiment depicted in Fig. 5, one or more second seat cushion members 501 are circumferentially placed along the top surface of the movable seat base portion 211 and between the movable seat base portion 211 and the fixed seat base portion 210. In an embodiment, the first seat cushion member 401 and the second seat cushion member 501 are made of different materials. For instance, the second seat cushion member 501 is made of a variable density or a low-density poly urethane (PU) foam, while the first seat cushion member 401 is made of a poly urethane (PU) foam.

[00052] Fig. 6 illustrates a characteristic curve depicting locking force against interference for a seat base assembly in accordance to an implementation of the present subject matter. In an embodiment, the characteristic curve depicted in Fig. 6 illustrates amount of locking force to be applied for the amount of deflection of the seat base assembly, in other words, for the amount of interference between the top portion of the helmet 208 and the bottom portion of the seat base assembly 209. Characteristic curve 601 depicts the locking force required to be applied at a locking end of the seat base assembly owing to the interference between the helmet and the seat base assembly in case of a conventional seat base assembly, which is provided with only the fixed seat base portion and without a movable seat base portion. Characteristic curve 602 depicts the first embodiment of the present invention, in which the seat base assembly 209 is provided with the movable seat base portion 211. As can be seen, the locking forces required to be applied at the locking end of the seat base assembly is substantially lesser for a similar amount of

interference achieved between the top portion of the helmet 208 and the movable seat base portion 211. Characteristic curve 603 depicts the second embodiment of the present invention, in which the seat base assembly is provided with the movable seat base portion 211 and the second seat cushion member 501 disposed between the movable seat base portion 211 and the fixed seat base portion 210. From the characteristic curve 603, it is clear that even though the locking forces necessary to be applied at the locking end of the seat base assembly 209 is slightly more than the first embodiment without the second seat cushion member 501, the fact that the second seat cushion member 501 is enabling in reduction of clattering noise caused due to the movable seat base portion 211 and also prevents the dislocation of the movable seat base portion 211, ensures that maximum comfort is achieved.

[00053] Fig. 7 illustrates a perspective top view of a seat structure of a saddle-type vehicle, in accordance to a third embodiment of the present subject matter. The third embodiment depicted in Fig. 7 provides a slidable seat base portion 701 of the seat base assembly 209, which is disposed above the fixed seat base portion 210. The slidable seat base portion 701 is similar to the movable seat base portion 211 in its function in terms of allowing the top portion of the helmet to be accommodated without causing distress to the seat cushion member 401. The difference being the mode of operation between the two variants. The slidable seat base portion 701 extends laterally or longitudinally in a horizontal direction of the vehicle 100 when establishing a contact with the top portion of the helmet 208, while the movable seat base portion 211 extends vertically upward.

[00054] Fig. 8 illustrates a sectional side view of a rear structure of a saddle-type vehicle, in accordance to a fourth embodiment of the present subject matter. The fourth embodiment depicted in Fig. 8 illustrates a storage member 805 of the vehicle 100 capable of accommodating more than one helmet. For instance, a first helmet 803 is placed in a front portion of the storage member 805, while a second helmet 804 is placed in a rear portion of the storage member 805. In an embodiment, a first movable/slidable seat base portion 801 is provided to accommodate the interfering top portion of the first helmet 803, while a second movable/slidable seat base portion 802 is provided to accommodate the interfering top portion of the second helmet 804. Thus, it is clear that even when two helmets are to be positioned, the movable/slidable seat base portions of the present invention ensures that the locking forces required to be applied at the locking end of

the seat base assembly 209 does not unduly increase causing maximum discomfort to the rider, in addition to affecting the overall strength and rigidity of the seat base assembly 209.

[00055] FIG. 9 illustrates a sectional side view of a seat base assembly of a saddle-type vehicle, in accordance to an implementation of the present subject matter. In an embodiment, the seat base assembly 209 includes one or more elastomeric member(s) 901 disposed at an interfering region between the movable seat base portion 211 and the second seat cushion member 501. In an implementation, the multi-directional movement of the movable seat base portion 211 tends to cause noise and vibration. To overcome this problem, the present invention is provided with the elastomeric member 901 between the movable seat base portion 211 and the second seat cushion member 501, or the fixed seat base portion 210, in case of an embodiment provided without the second seat cushion member 501. This, ensures that the movable seat base portion 211 is configured to move unidirectionally. This elastomeric member 901, in an embodiment, can be made of rubber. In an embodiment, this elastomeric member 901 can be enmolded with the seat base member 210 or seat base portion 211. In another embodiment, the elastomeric member 901 can be either sealed or pasted either to the movable seat base portion 211 or to the fixed seat base portion 210.

[00056] Although the subject matter has been described with reference to specific embodiments, this description is not meant to be construed in a limiting sense. Various modifications of the disclosed embodiments, as well as alternate embodiments of the subject matter, will become apparent to persons skilled in the art upon reference to the description of the subject matter. It is therefore contemplated that such modifications can be made without departing from the spirit or scope of the present subject matter as defined.

List of reference numerals

100 – Saddle type vehicle	207 – Bottom surface of the storage member
101 – Front wheel	208 – Oversized article
102 – Rear wheel	209 – Seat base assembly
103 – Front panel	210 – Fixed seat base portion
104 – Head tube	211 – Movable seat base portion
105 – Left front bottom panel	212 – Hinged end of seat base assembly
106 – Side panel	213 – Locking end of seat base assembly
107 – Front fender	214 – Locking force acting direction
108 – Floorboard	301 – Conventional seat base assembly
109 – Handlebar assembly	302 – Seat cushion
110 – Seat structure	303 – Seat base member
111 – Main frame	304 – Utility box
112 – Rear fender	305 – Interfering portion of helmet
113 – Tail light	306 – Hump portion of utility box
115 – Front cover assembly	307 – Original seat cushion thickness
116 – Headlamp assembly	308 – Reduced seat cushion thickness
117 – Rear suspension	A-A – Section taken along central portion of seat structure
118 – Front fork	401 – First seat cushion member
201 – Rear structure	402 – Interfering portion of movable seat base portion and helmet
202 – Power unit	403 – First thickness
203 – Topmost portion of the power unit	404 – Second thickness
204 – Front end of the power unit	501 – Second seat cushion member
205 – Rear end of the power unit	
206 – Storage member	

600 – Characteristic curve depicting locking force against interference

601 – First curve (prior art)

602 – Second curve (first embodiment)

603 – Third curve (2nd embodiment)

700 – Third embodiment of seat structure

701 – Slidable seat base portion

800 – Fourth embodiment of seat structure

801 – 1st movable/slidable seat base portion

802 – 2nd movable/slidable seat base portion

803 – 1st helmet

804 – 2nd helmet

805 – Storage member

901 – Elastomeric member

We claim:

1. A saddle type vehicle (100), said vehicle comprising:
a handlebar assembly (109) for steering said vehicle (100);
a seat structure (110) disposed rearwardly to said handlebar assembly (109),
5 said seat structure (110) includes a seat base assembly (209); and
a storage member (206) disposed under said seat structure (110), said
storage member (206) is configured to accommodate one or more oversized
article(s) (208),
said seat base assembly (209) of said seat structure (110) comprising a
10 fixed seat base portion (210) and a first seat cushion member (401), a
movable seat base portion (211) being disposed between said fixed seat
base portion (210) and said first seat cushion member (401), said movable
seat base portion (211) is capable of moving when establishing a contact
with said one or more oversized article(s) (208) accommodated within said
15 storage member (206).
2. The saddle type vehicle (100) as claimed in claim 1, wherein said movable
seat base portion (211) is configured to move unidirectionally.
3. The saddle type vehicle (100) as claimed in claim 1 or 2, wherein said
movable seat base portion (211) is configured to move at least in one of a
20 vertical direction towards a fixed seat base portion (210) and a horizontal
direction along a longitudinal direction or a transverse direction of the
vehicle (100).
4. The saddle type vehicle (100) as claimed in claim 1, wherein said seat
structure (110) comprising a second seat cushion member (501) disposed
25 between said movable seat base portion (211) and said first seat cushion
member (401).
5. The saddle type vehicle (100) as claimed in claim 1 or 4, wherein said first
seat cushion member (401) and said second seat cushion member (501) are
made of different materials, said first seat cushion member (401) is made of

a Poly Urethane (PU) foam, and said second seat cushion member (501) is made of a variable/low density Poly Urethane (PU) foam.

- 5 6. The saddle type vehicle (100) as claimed in claim 1 or 4, wherein said seat base assembly (209) comprises an elastomeric member (901) disposed between said movable seat base portion (211) and at least one of said fixed seat base portion (210) and said second seat cushion member (501).
7. The saddle type vehicle (100) as claimed in claim 1, wherein said one or more oversized article(s) (208) includes at least one helmet (208).
- 10 8. The saddle type vehicle (100) as claimed in claim 1, wherein said storage member (206) has a flat bottom surface (207) extending longitudinally along a vehicle longitudinal axis and disposed above a power unit (202) of said vehicle (100).

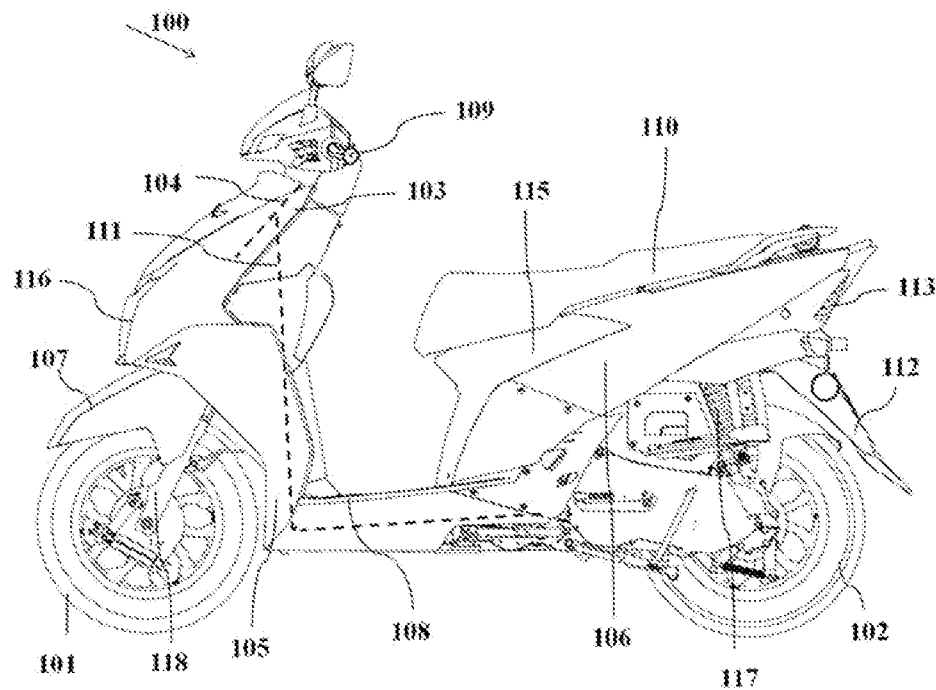
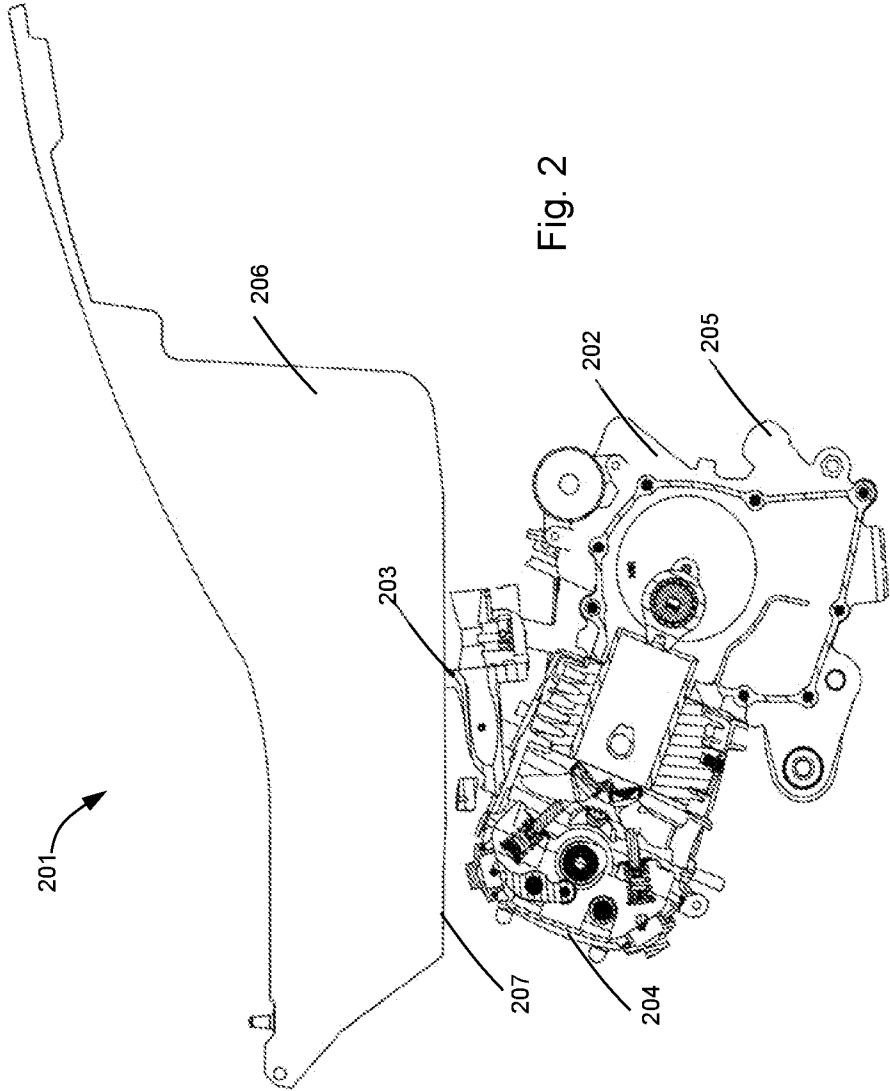
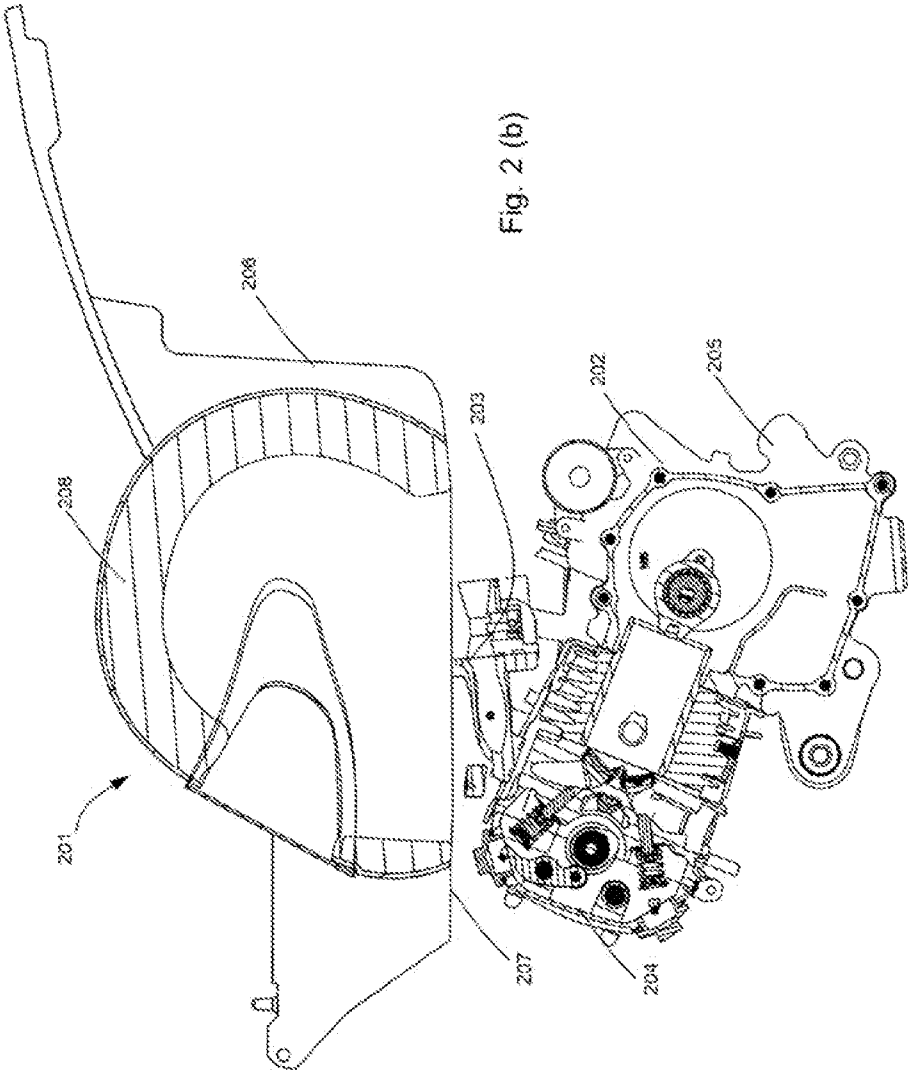
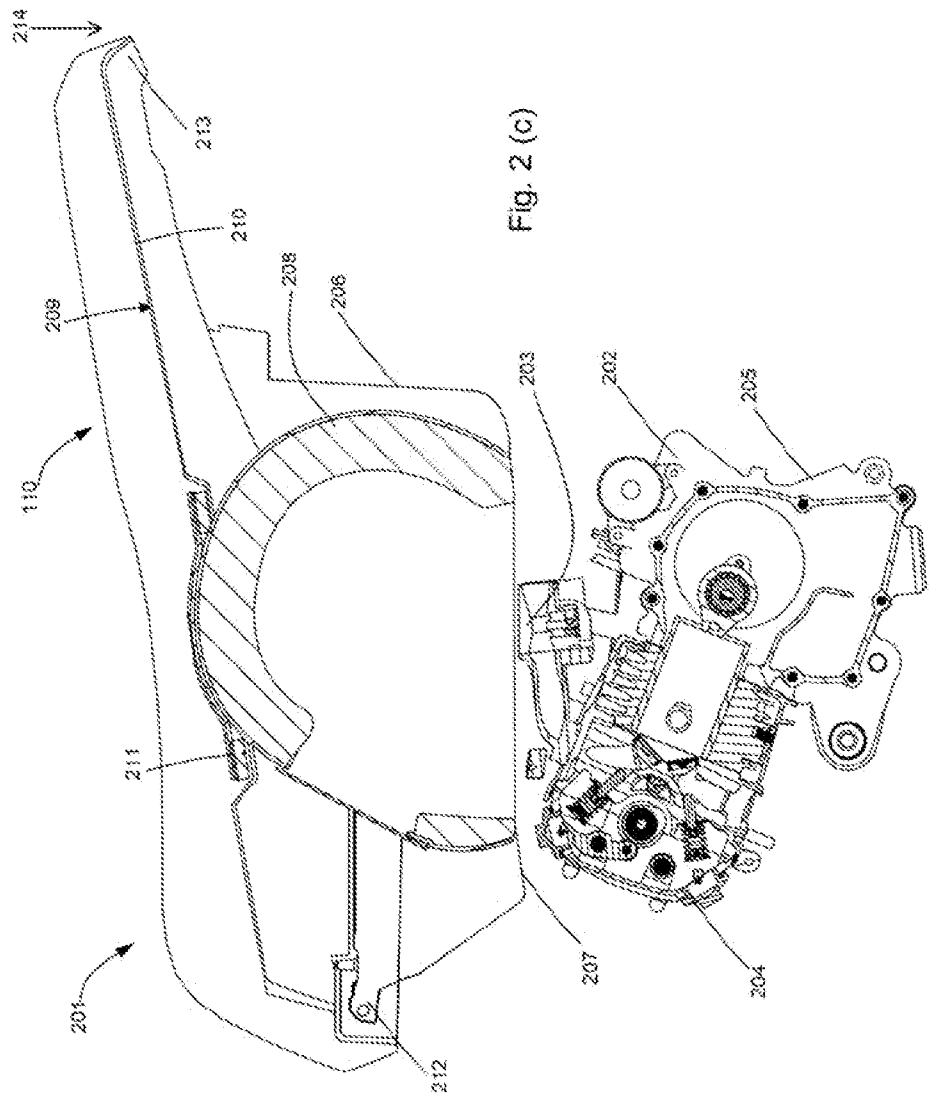


Fig. 1







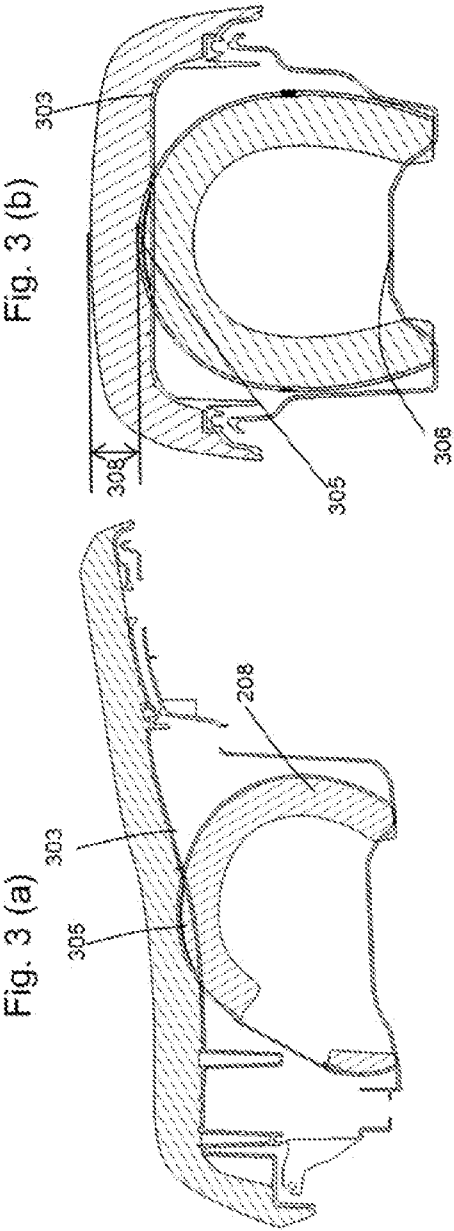
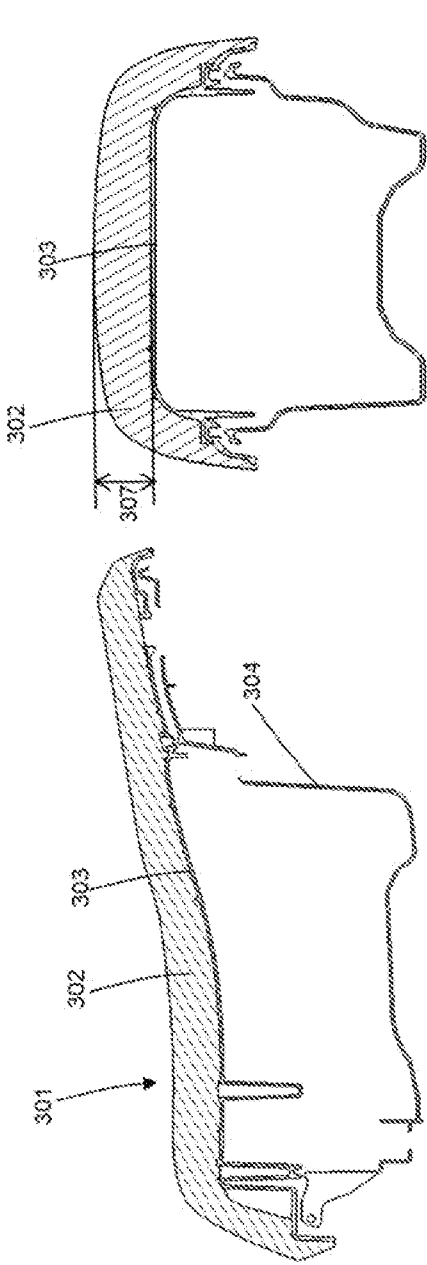


Fig. 3 (b)

Fig. 3 (d)

Fig. 3 (a)

Fig. 3 (c)

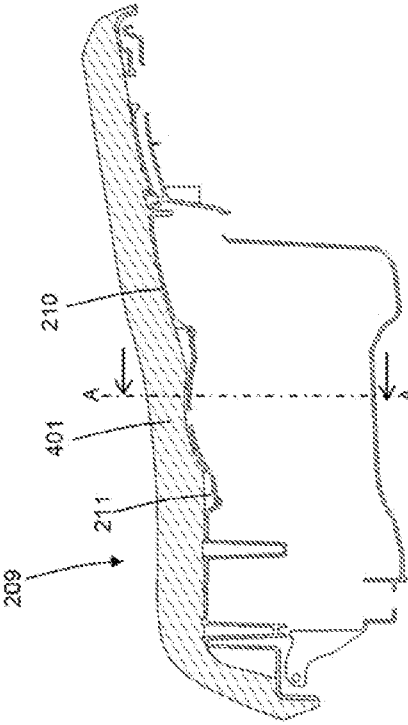


Fig. 4 (a)

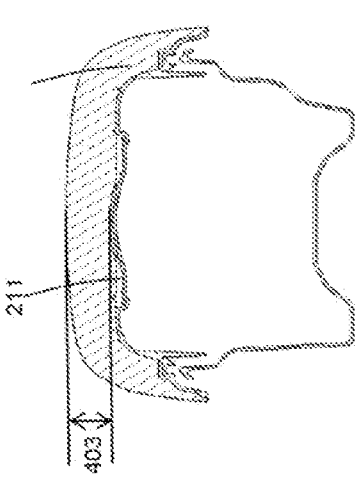


Fig. 4 (b)

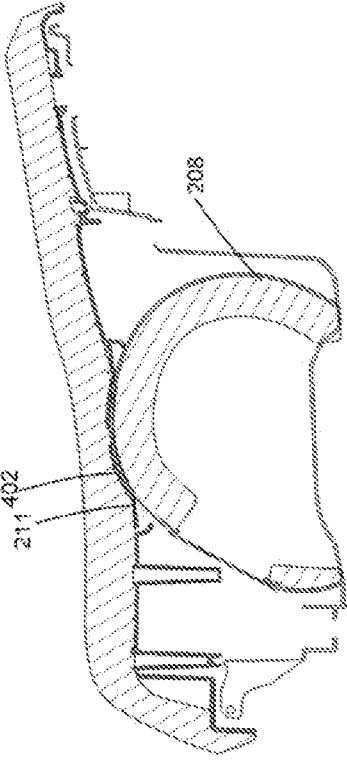


Fig. 4 (c)

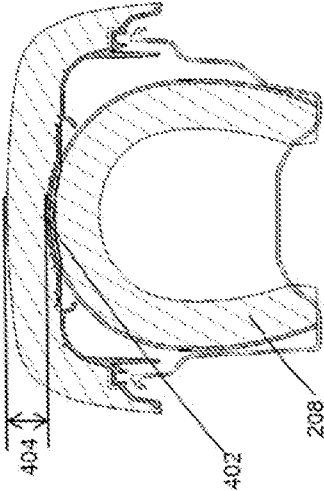


Fig. 4 (d)

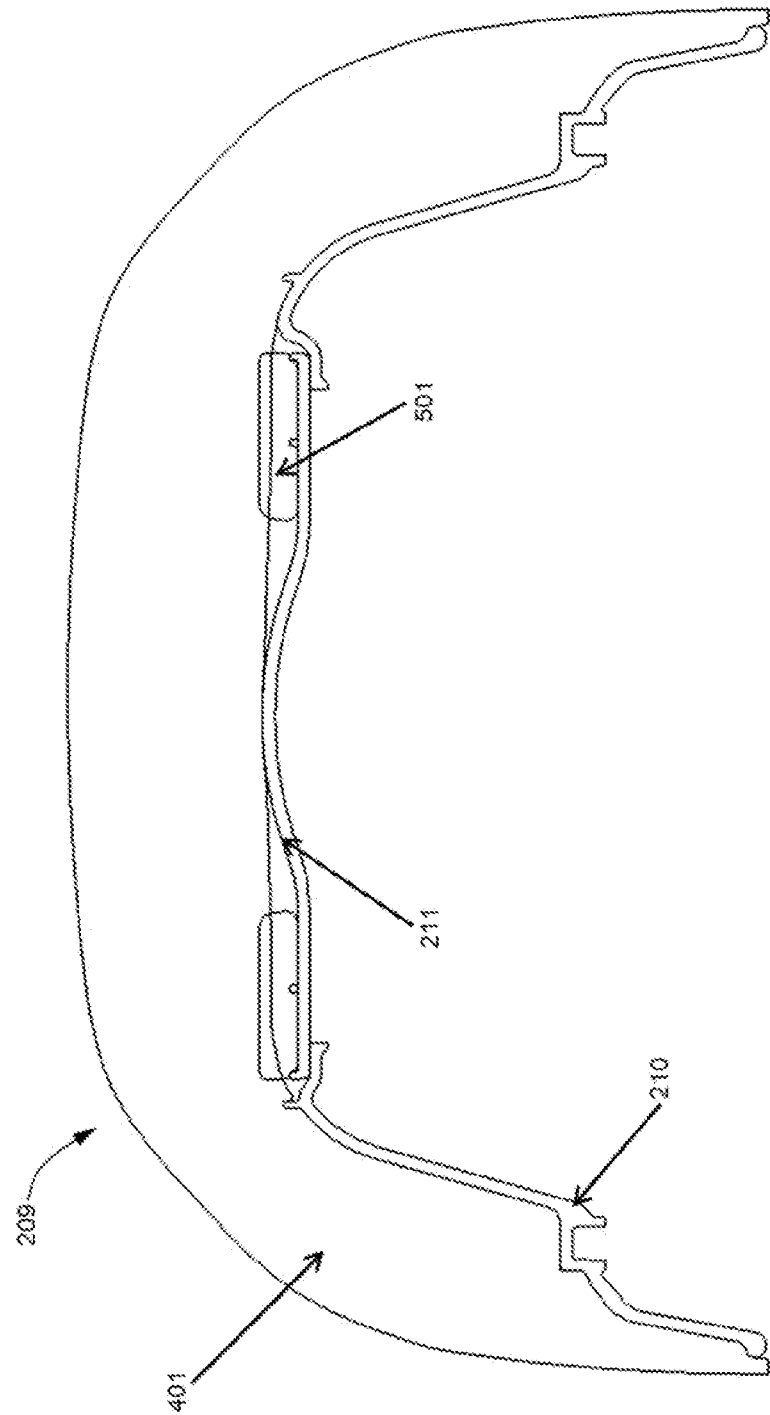


Fig. 5

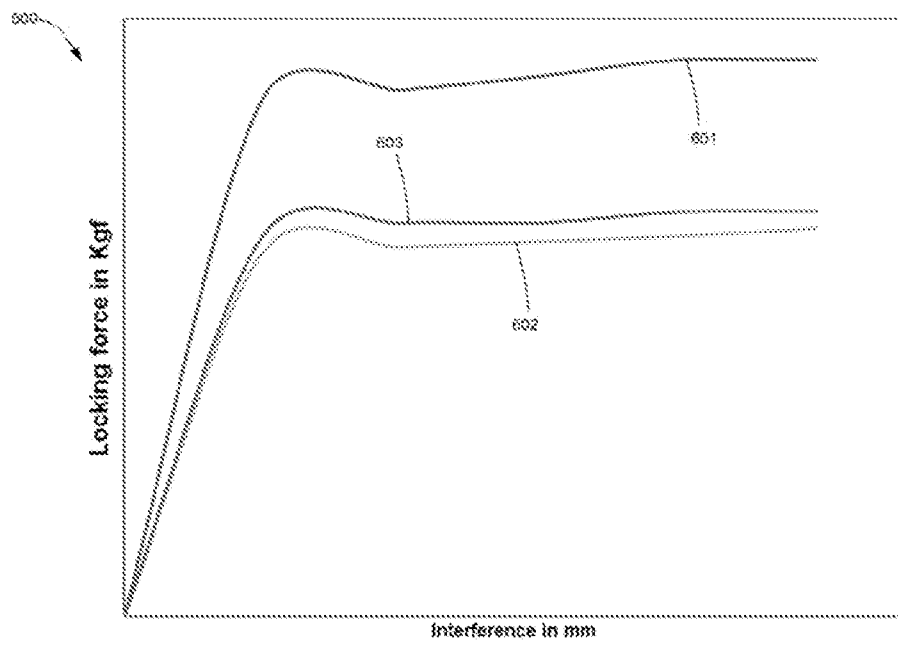


Fig. 6

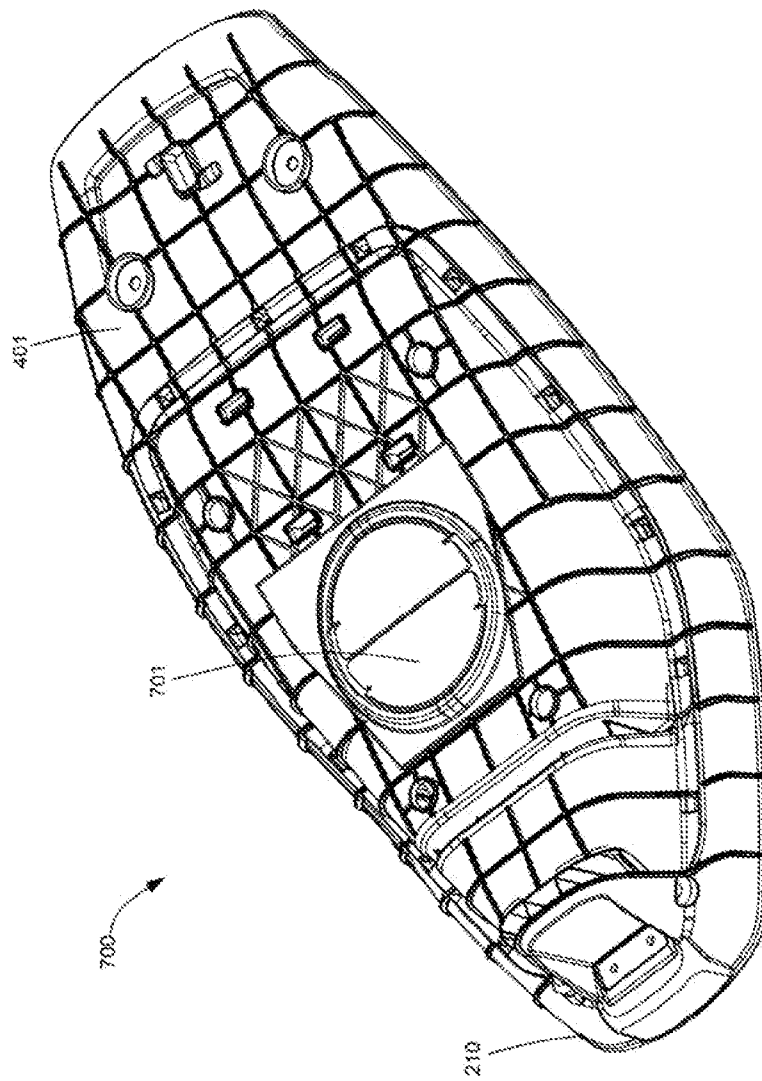


Fig. 7

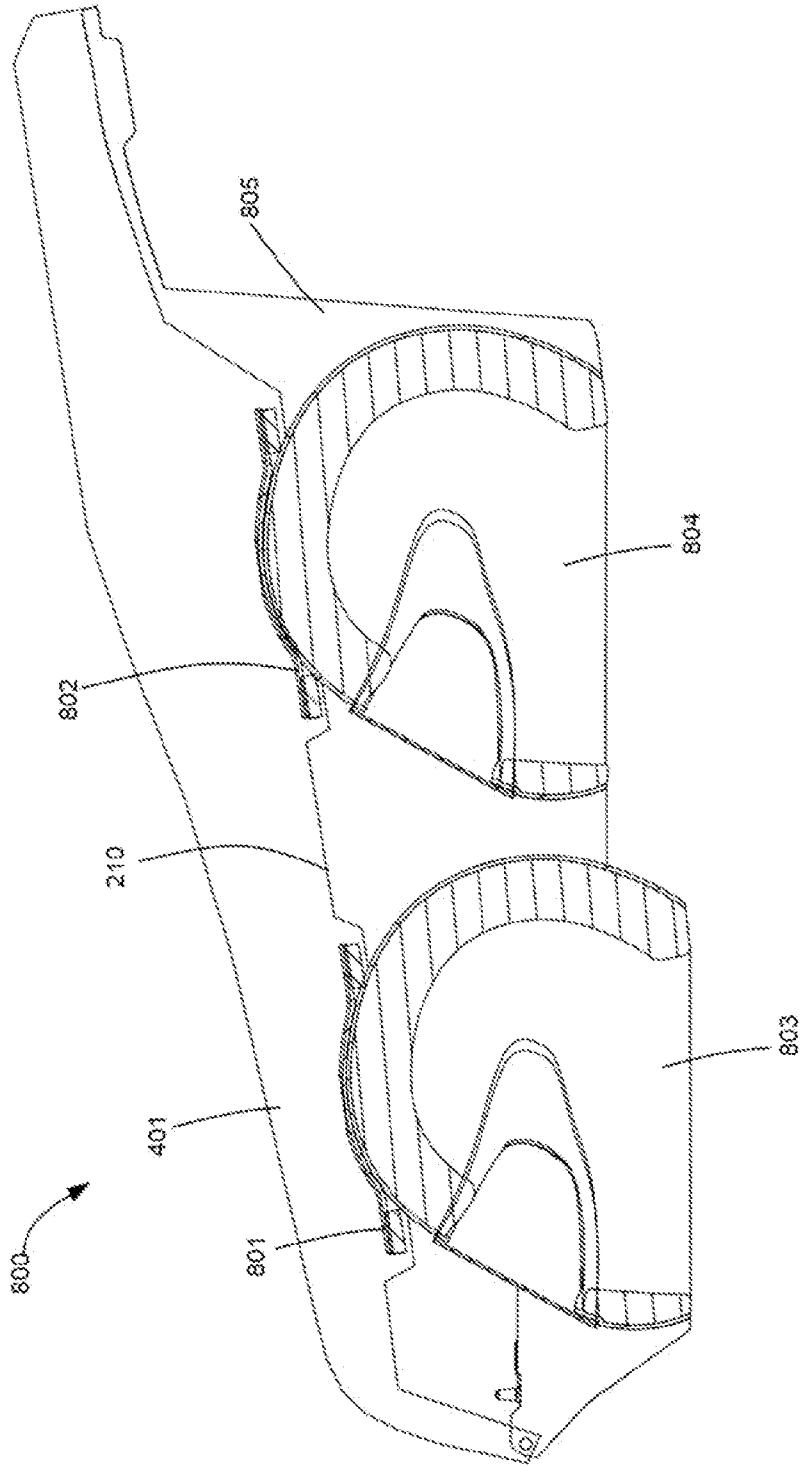


Fig. 8

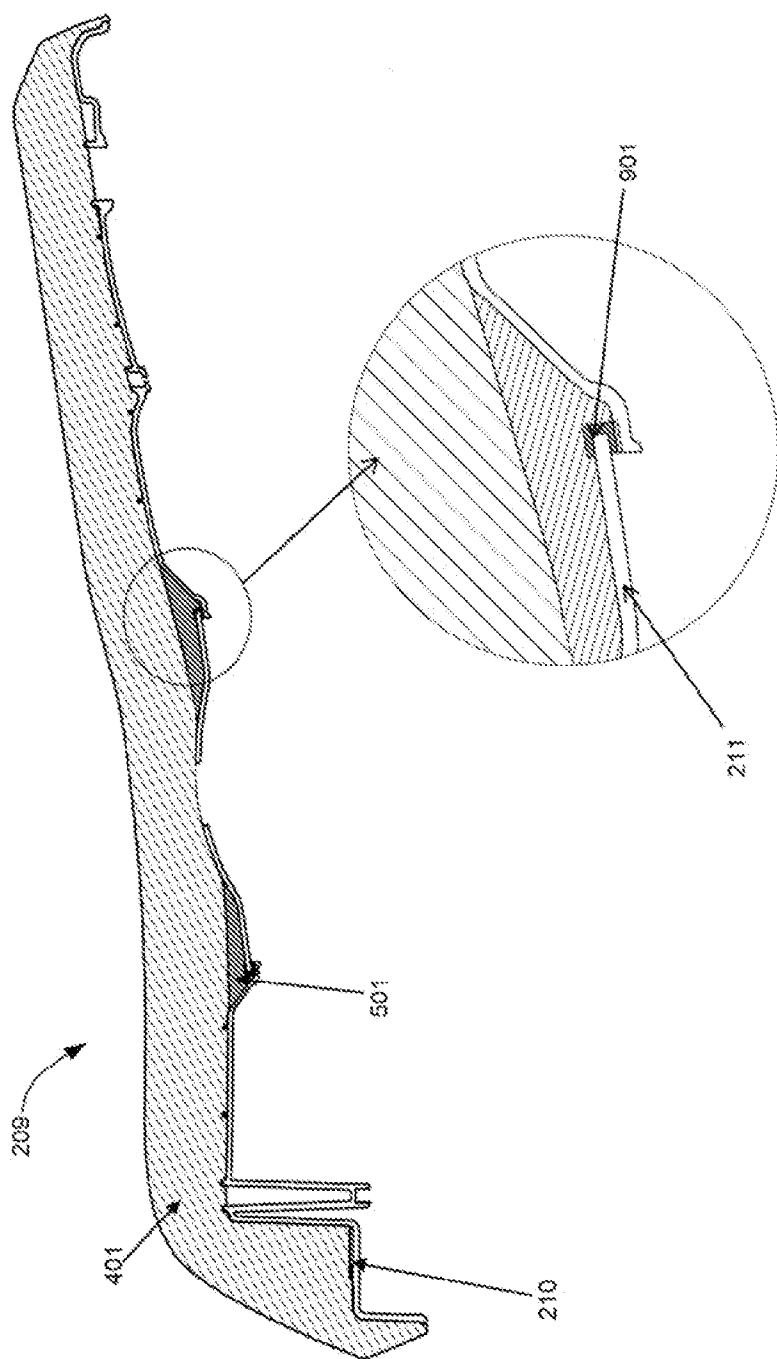


Fig. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IN2021/050234

A. CLASSIFICATION OF SUBJECT MATTER
B62J9/14 Version=2021.01

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B62J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

TotalPatent One, IPO Internal Database

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JPH11227654A (HONDA MOTOR CO LTD; 24 August 1999) para [0011]-[0024] of english translation from Espacenet; fig. 1-6;	1, 2, 7, 8
Y	the whole document;	3-6
X	JP2002211460A (HONDA MOTOR CO LTD; 31 July 2002) D2- para [0013], para [0018]-[0019] of english translation from Espacenet; fig. 1-3;	1, 2, 7, 8
Y	the whole document;	3-6
X	CN1778619B (KWANG YANG MOTOR CO; 05 May 2010) para [0005], para [0009], para [0030]-[0033] of english translation from Espacenet; fig. 4-6;	1, 2, 7, 8
Y	the whole document;	3-6
Y	US7299889B2 (YAMAHA MOTOR CO LTD; 27 November 2007) column 6, line 17-line 49; fig. 10,11;	4, 5



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

12-07-2021

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/IN2021/050234

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US2009309396A1 (RTI SPORTS VERTB SPORTARTIKELN; 17 December 2009) para [0027]; fig. 4;	3, 6

INTERNATIONAL SEARCH REPORT
Information on patent family members

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PCT/IN2021/050234

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