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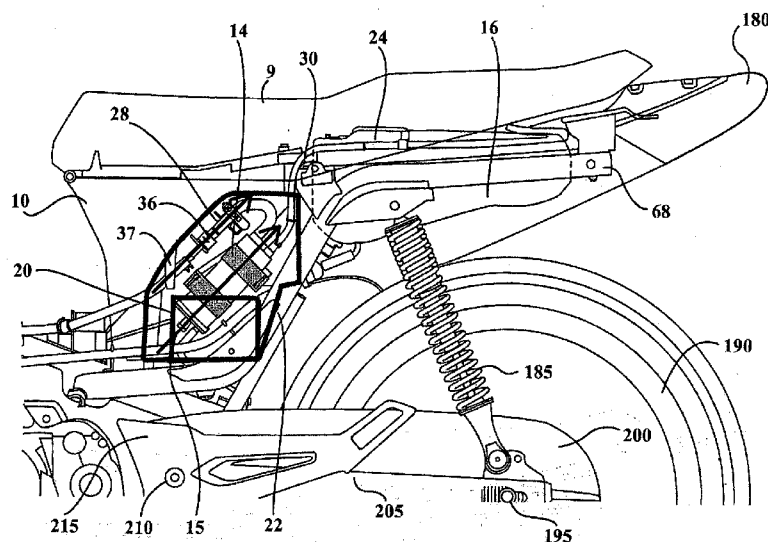


FIG. 6

(57) Abstract: The present invention disclosed a canister mounting structure 8 for a motorcycle 100 comprising a storage box 10 mounting under a seat 9 of the motorcycle 100; a canister 14 mounted in a recess portion 22 of said storage box 10 and communicably connected to a fuel tank 16 and an engine intake system 18 so as to collect vaporized fuel; said storage box 10 stores a battery 20 therein and comprising said recess portion 22 formed externally to a side surface of said storage box 10 and is overlapping with said battery 20; and wherein said canister 14 is mounted in the rear-upwardly manner inside said recess portion 22 of the said storage box 10.

TITLE OF THE INVENTION
CANISTER MOUNTING STRUCTURE FOR A MOTORCYCLE

FIELD OF THE INVENTION

The present invention relates to a canister mounting structure for a motorcycle.

5 BACKGROUND OF THE INVENTION

Various arrangements of a canister for a two-wheeler vehicle such as a motorcycle or a scooter are known. US Patent Publication No. 2010/0163328 A1 disclosed a saddle-ride type vehicle of which includes a storage box (35) under the seat (36) with a bulging portion (34), and engine, a fuel tank and a canister (44) arranged therein. The storage box (35) includes a recessed portion (65) disposed on a lower surface of the storage box. The canister (44) is arranged along the recessed portion (65) and is secured thereto with elastic mounting members (68) in manner to direct the longitudinal side of canister to side direction of motorcycle.

However, it's common to store a battery into the storage box in motorcycle. In that
15 situation, the battery mounting structure is very difficult to keep the space in the
arrangement as disclosed by the prior art, because the recessed portion makes some
projection portion to the side direction into the storage box on the bottom surface of the
storage box. Especially, it will be even more difficult to utilize the arrangement in smaller
or slimmer model of a motorcycle of which the both the fuel tank and the storage box are
20 placed under the seat due to limited space.

Therefore, a new and improve canister mounting structure for a motorcycle is desired.

SUMMARY OF THE INVENTION

The present invention aims to provide an alternative canister mounting structure for
25 a motorcycle which efficiently mounts the canister to the storage box while maintaining
optimum space for storing battery and without making the storage box and the body cover
widen to the side of the motorcycle.

In an embodiment of the present invention, the canister mounting structure for a motorcycle comprising a storage box supported on a vehicle frame, a canister communicably connected to a fuel tank and an engine intake system. The storage box is designed to store a battery therein and comprising a recess portion prepared to house the
5 canister. The fuel tank which stores fuel to be supplied to an engine, positions to the rear of the motorcycle and behind the storage box. The canister receives fuel vapor from the fuel tank and is connected to the fuel tank via a first connecting tube, and connected to a carburetor via second connecting tube to collect and deliver fuel vapor to the engine intake system.

10 According to this invention disclosed in claim 1, said recess portion is formed externally to a side surface of said storage box and is overlapping with said battery and said canister is mounted in the rear-upwardly manner inside said recess portion of the said storage box .

As the recess portion storing Canister is formed in side surface of the storage, it's possible
15 to overlap with Battery and the recess portion and it could keep the battery mounting space. Furthermore, as canister is directed to rear-upwardly in the recess portion, it's possible to fit the extent of length of the storage box in front-rear direction.

According to this invention disclosed in claim 2, said canister connected to a one-way vale-which is mounted in said recess portion and aligned parallel and close to said
20 canister. It's possible to mount canister and one-way valve closer, then said recess portion make smaller and the influence to the capacity of storage box be minimized.

According to this invention disclosed in claim 3, said one-way vale is disposed above said canister. The heavier canister is mounted below, then it contributes the low gravity of motorcycle and easier confirmation of one-way valve from upper-side is
25 possible to avoid forgetting assembly.

Accordingly to this invention disclosed in claim 4, said canister connected to said fuel tank and said engine intake system by a first connecting tube and a second connecting tube respectively and said fuel tank is mounted under said seat and behind said storage box and said first connecting tube and said second connecting tube are connected to said

canister at its upper rear end. So, gathering the first and second connecting tubes on upper side of canister is easy to assemble and maintenance.

According to this invention disclosed in claim 5 and 6, said first connecting tube is wiring to said canister and said fuel tank by a guide means comprising a guide hole and a guide groove. Said guide hole is opened on the upper surface of said storage box and said
5 guide groove is opened on rear surface of said storage box, so as to receive said first connecting tube inserted there through. Even though the first connecting tube should be curved from fuel tank to canister because fuel tank is higher position than canister of side portion of storage box, it is possible to wire without any stress by guide means. Especially,
10 2 functions of hole and groove makes possible to support the line effectively after curving.

According to this invention disclosed in claim 7-11, it relates the guide or securing means for the connecting tube. Said second connecting tube is secured by a guide wall which projected downward restricting said second connecting tube from protruding outward of said recess portion. The curving portion curved from said upper rear end of said
15 canister to forward of motorcycle, of second connecting tube is secured by a first securing means. Said first securing means is comprising a holding wall and a fixed screw, a rotatable retaining plate. Said canister mounting structure is further comprising a second securing means formed between said one-way valve and said engine intake system to limit the moving of wiring direction of said second connecting tube. Said second securing
20 means is comprising a positioning member next to said one-way valve, and including a cut away section, and a support bar supporting the downstream section of said second connecting tube before a guide wall.

As to prevent the second connecting tube to project to outside of motorcycle, the storage box is mounted closer to body cover, then it's possible to achieve the slim of body
25 cover and maximum of storage box capacity at same time. The side and longitudinal directions of said second connecting tube is controlled effectively in curving portion and downstream portion on both sides of one-way valve even though said tube is curved a lot. It possible to use the positioning the cut away section and one-way valve without any special parts.

According to this invention disclosed in claim 12 and 13, the canister mounting structure is comprising a third securing means comprising a pair of spaced-apart elastic members and a pair of spaced-apart hook member. The pair of hook members are arranged in diagonal direction with an axis line of said canister from a side view. Even though
5 canister received any vibrations, diagonal support of canister prevents to move too much, then canister is not disassembled by vibration and it's possible to mount body cover close to canister. Accordingly, we can make slim of motorcycle and easier to design said recess portion.

According to this invention disclosed in claim 14, said second connecting tube is
10 secured by a plurality of guide pins. This is second embodiment. It is not necessary to set special clip, then it's more effective to regulate the tube line.

According to this invention disclosed in claim 15, said canister is positioned within the recess portion of the storage box and on an inner side of a pair of rear frame which run along the side of the motorcycle and extend upwardly from the low portion of said storage
15 box to rearward of said storage box. Because of mounting the canister inner of rear frame, said canister is protected by said rear frame from outside impact.

According to this invention disclosed in claim 16, the axis line of said canister is directed about to the center of crankshaft. So, the degree of the axis line of canister would be about 45° of ground line, and it has the advantage for the vibration of engine
20 component

According to this invention disclosed in claim 17, the battery is positioned lengthwise in said storage box in manner that each terminal (+, -) of said battery is aligned to front-rear direction, and the terminals of said battery are positioned on the opposing side of said canister. Battery is narrow in side direction of vehicle, so it's easy to mount in storage
25 box even though there is projected inner wall of said recess portion and it's good that battery is far from canister.

BRIEF DESCRIPTION OF DRAWINGS

The principle of the present invention and its advantage will become apparent in the following description taking in conjunction with the accompanying drawings in which:

FIG. 1 shows a front side view of a motorcycle comprising an embodiment of a canister mounting structure according to the principle of the present invention.

FIG. 2 shows a front side view of a motorcycle comprising an embodiment of a canister mounting structure according to the principle of the present invention with detail illustration of a frame structure of a motorcycle;

FIG. 3 shows a front side view of a motorcycle comprising an embodiment of a canister mounting structure according to the principle of the present invention with detail illustration of around engine structure of a motorcycle;

FIG. 4 shows a front perspective view of an embodiment of a canister mounting structure of a motorcycle according to the principle of the present invention;

FIG. 5a shows a top plane view of a storage box and an embodiment of a canister mounting structure of a motorcycle according to the principle of the present invention;

FIG. 5b shows a top plane view of a storage box;

FIG. 6 shows a side view of a rear section of a motorcycle comprising an embodiment of a canister mounting structure according to the principle of the present invention with detail illustration of the rear structure of a motorcycle;

FIG. 7a shows a front side view of an embodiment of the canister mounting structure around the canister;

FIG. 7b shows additional view of a front side view of an embodiment of the canister mounting structure around the canister of FIG. 7a with illustration of canister axis line;

FIG. 8 shows a close-up view of a securing means of the canister mounting structure of a motorcycle according to the principle of the present invention;

FIG. 9a shows cross section of X-X FIG.8 and FIG. 11a and close-up view of a securing means;

FIG. 9b shows alternative view of FIG 9a;

FIG. 10a shows embodiments of securing means of the canister mounting structure of a motorcycle according to the principle of the present invention;

FIG. 10b shows top elevated view of FIG.10a;

FIG. 10c shows side view of a hook member;

FIG. 11a shows a side plane view of the storage box;

FIG. 11b shows a back plane view of the storage box;

5 FIG. 12 shows a front view of an embodiment of the canister mounting structure of the motorcycle around the seat,

FIG. 13 shows a rear perspective view of an embodiment of the canister mounting structure motorcycle according to the principle of the present invention with an alternative embodiment of a securing means.

10 DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

The present invention disclose a canister mounting structure 8 for a motorcycle 100 which efficiently mounts a canister to the storage box 10 while maintaining optimum storage space for storing battery 20 so as not to make the storage box 10 and the body cover widen to the side of the motorcycle 100.

15 FIGS. 1-4 show an embodiment of the canister mounting structure 8 for a motorcycle 100 according to the principle of the present invention. The motorcycle 100 is constituted of a handle 105 steerably mounted on a head pipe 106 connected to the motorcycle main pipe 12; a combination of a headlight 110 and a pair of winker lights 111 are assembled to a front section of the head section of the motorcycle 100 and are covered
20 by, front handle cover 120 and rear handle cover 125; a front cover 130 immediately placed adjacent to the head section, the head pipe 106, and at its lower section, is connected to a pair of front fork 135 supporting rotation of a front wheel 140 at a front axle 145; the front wheel 140 is equipped with a front tire 150, and a drum brake 155 whereby applying a brake allows controlling of rotation of the front wheel 140; a front fender 161 is
25 provided with both front forks 135 on just above the front wheel 140 and is configured to cover upper part of the front wheel 140 to block dirt or debris picking up by the rotation of the front wheel 140; a vehicle body cover including a main pipe cover 160 extend from about the underneath the rear handle cover 125 along the main pipe 12 and toward the mid-section of the motorcycle 100; a pair of front cover 130 covering an engine intake

system 18; a pair of front side cover 162 is mounted on both sides of the main pipe cover 160 and continued to a pair of leg-shield portion 165 provided also to the left and right sides of the motorcycle 100 to provide cover to the lower leg of a rider sitting on a seat 9 having his foot rest on a step 214 disposed on each side of the motorcycle 100 ; continuous
5 with the body cover are a pair of seat side covers 170 and a pair of rear side covers 175 extend toward the rear of the motorcycle 100 and designed to cover both sides of the motorcycle 100; a combination of tail & stop lamp and rear winker lamps 180 is disposed at the rear end of the motorcycle 100; a pair of rear suspensions 185 support a pair of swing arm 205 on the rear of the motorcycle 100 and are assembled to a rear wheel 190,
10 having a rear tire 191 assembled thereto, at a rear axle 195; an upper and lower chain cases 200, 200'' attaching the left swing arm 205, are designed to cover the chain which pulls the rear wheel 190, swing arm pivot 210 makes the swing arms 205 swing to rotate and a passenger step holder 215 are disposed behind and above the engine; the engine system suspended at about a mid-section of the motorcycle 100 and under the main pipe 12 with a
15 pair of engine hunger portion 220a of a pair of pivot plate 220 welded to the main pipe 12 and a pair of swing arm pivot portion 220b of the pivot plate 220 support the swing arm 205 at the swing arm pivot 210; a pair of rear frame 68 extending from the main pipe 12 near the engine hunger portion 220 to backward horizontally and under the canister 14, extending upwardly, then at the side of a fuel tank 16, extending to backward (see FIG.2);
20 the engine of the motorcycle is 4 cycle type, comprising a cylinder 225 having an cylinder axis line 226 tilting forward in the about same line of ground with the a crank axle 250 and a camshaft axle 245, a cylinder head 230, a crank case 235, a drive axle 240 making the rear wheel rotate, lies substantially along the crank axle 250, and a starting motor 255 as generally known by a skilled person; the engine connected to an engine intake system
25 18 of which including the intake manifold 265 connecting the cylinder head 230, the carburetor 270 and the air cleaner 275 , an exhaust system also connected to the cylinder head 230 and includes an exhaust pipe leading to a muffler 280 directing toward the rear of the motorcycle 100 (see FIG.3); a fuel tank 16 position to the rear of the vehicle and stores fuel for the engine system; a seat 9 mounting in the upper portion of motorcycle 100

behind the handle 105 and is supported by a storage box 10 wherein a battery 20 stored for providing an electrical power supply to the motorcycle.

Referring to FIGs 4, 6, 7a, 7b the canister mounting structure 8 according to the present invention comprising the storage box 10 mounting on motorcycle frame, a canister 14 communicably connected to the fuel tank 16 and the engine intake system 18 of the motorcycle 100. The storage box 10 is designed to store the battery 20 with a battery cover 21 therein and comprising a recess portion 22 prepared to house the canister 14 to be fitted therein. The fuel tank 16 includes a fuel cap 17 which receives fuel into the fuel tank 16, and stores fuel to be supplied to the engine, via a fuel line 19, positions to the rear of the motorcycle 100 and behind the storage box 10. The fuel tank 16 has a fuel sensor unit 71 in front of the fuel cap 17 for detecting the fuel amount and indicating it in a meter.

As shown in FIG.6-7a, 7b, the recess portion 22 is formed externally in shape of rear upwardly inclination to a left side surface of the storage box 10 and is configured to house the canister 14. Preferably, the canister 14 is positioned in a rear-upwardly manner in the said recess portion 22. The fact that the recess portion is formed on the side of the storage box 10, it is possible to overlap with the space in the storage box 10 designates for storing battery 20. Hence, it is possible to maintain optimum storage capacity of the storage box 10. Further, by positioning the canister 14 in a rear upwardly manner in the recess portion 22, it is possible to fit the entire length of the canister 14 along the front-to-rear direction of the storage box 10. Further, by allowing the space for storing the battery 20 and the canister 14 to overlap, the arrangement taken less space and hence it is possible to achieve a motorcycle with a slimmer body. Preferably, the canister 14 is positioned in a rear-upwardly manner such that the axis line (15) of the canister 14 is directed about to the center of crankshaft 250 of the engine for better control of the impact from vibration of the engine (see FIG.3). An embodiment of a storage box 10 is also illustrated in detail in FIGs. 5b, 11a and 11b.

Further, as shown in FIG.5a, preferably, the battery 20 is also positioned lengthwise in a front-to-rear direction of the storage box 10 to minimize the side length to be taken by the battery 20, hence maintaining a slim body of the motorcycle. Further, it is preferred that the battery is positioned, in relative to the canister 14, such that the battery's

(+) terminals 21a and (-) terminal 21b are positioned opposing to and away from the canister, i.e. the battery's side of which the terminals 21a, 21b are located is positioned opposite to the side of the battery adjacent to the canister 14. This arrangement is designed as a safety precaution. The canister 14, at its upper rear end, is connected to the fuel tank 16 and the engine intake system 18 via a first connecting tube 24 and a second connecting tube 28. The canister 14 receives fuel vapor from the fuel tank 16, via the first connecting tube 24 of which connects the canister 14 to a fuel separator 26 for dividing liquid and vapor, located at the fuel tank 16. Positioning of both the first connecting tube 24 and the second connecting tube 28 to the upper rear end of the canister 14 provides better visual access to their connections and easy access thereto during assembly or maintenance. The first connecting tube 24 runs right direction at first, and turn around the back and left side outline shape of the fuel tank 16 and is secured to the external surface of the fuel tank 16 at desired locations. As motorcycle often have a side stand in left side of vehicle and the right side is higher than left during side stand situation, it's so effective for vapor flow to deliver the connecting line from right to left. Further, to ensure a secured connection of the first connecting tube 24 to the canister 14 and the fuel tank 16, the first connecting tube 24 is wired to guide by a guide means 30.

In one embodiment, the guide means 30 comprising a guide hole 32 and a guide groove 34 (with a back 34a) prepared on the side of the rear portion of the storage box 10 (FIGs 4, 5a, 6, 7a, 7b. 9) to facilitate securing of the first connecting tube 24. The guide hole 32 realized as an opening integrally prepared on the rear upper surface of the storage box 10 and is connected to the guide groove 34 opened backwardly on back surface of the storage box 10, of which receives and guides the first connecting tube 24 through said guide hole 32 (FIG. 5a) to the recess portion 22 of the storage box 10.. By directing or guiding the positioning of the first connecting tube 24 using the guide means 30, the first connecting tube 24 is secured to the fuel tank 16, the storage box 10 and the canister 14 with less or minimized stress despite the fact that the fuel tank 16 is positioned higher than the canister 14 and curving of the first connecting tube 24.

As shown in FIGs.1-4, the canister 14 is also connected, at its rear end, to the engine intake system 18 via a second connecting tube 28. The second connecting tube 28 is

secured to the storage box 10 as well as to the main pipe 12 of the vehicle as the second connecting tube 28 runs along the main pipe to the engine intake system 18. A one-way vale 36 is disposed on the second connecting tube 28 to regulate dispensing of the filtered fuel vapor to the engine intake system 18 as well as to avoid returning of fuel vapor and re-
5 entering the canister 14.

While the second connecting tube 28 is connected to the rear of the canister 14, it is curved backward (from back-to-front) toward the front of the vehicle, especially toward the engine intake system 18 such that a portion of the second connecting tube 28 which run along the length of the canister 14 is aligned to be paralleled and close to the canister 14.
10 That is, the axis of the said section of the second connecting tube 28 is paralleled to the canister 14 longitudinal axis line 15 and hence the second connecting tube 28 is essentially lies parallel and above the canister 14. The one-way valve 36 is positioned in the said section of the second connecting tube 28 and thereby the one-way valve 36 also lies parallel and close above the canister 14. By arranging the second connecting tube 28 in
15 such manner in relation to the canister 14, it much easier to effectively restrict the sideway and longitudinal movements of the second connecting tube 28, despite the fact that the second connecting tube 28 is curved in various locations. Further, it also makes the arrangement more compacted and hence both the canister 14 and the second connecting tube 28 can be easily fitted into the recess portion 22 of the storage box 10 and minimizing
20 the space taken by them, and thus a more compacted recess portion 22 which in turn results in more available space in the storage box 10 and slim body of the motorcycle 100. Further, by placing the one-way vale 36 above the canister 14, it is not only reduce the gravitational impact (due to the weight of the canister, and hence a more secured connection), it also provides easy access and confirmation for the engineer during
25 assembly and inspection of the arrangement at the assembly line and or during maintenance services.

To even further enhance securing the second connecting tube 28 to the storage box 10, the second connecting tube 28 is guided into the recess portion 22 of the storage box 10 by a guide wall 37 design to further restricting movement of the second connecting tube
30 28. The guide wall 37 is made integral to the storage box 10 through single action molding

of the storage box 10. The guide wall 37 is projected downward toward the front of the canister 14. Preferably, the guide wall 37 is positioned approximately around the area which the second connecting tube 28 exits the recess portion 22 of the storage box 10. It will be apparent by a skill person that the shape and configuration of the guide wall 37 may
5 be of any other shapes and configurations while serving the same purposes. It is also possible to prepare the guide wall 37 separately from the storage box 10 and secure to the storage box 10 via suitable connection means such as screw or rivet or any other suitable fasteners. The guide wall 37 helps to restrain the second connecting tube 28 from projecting outward out of the recess portion 22 or to the side of the motorcycle 100, and
10 with the combination of a smaller and compacted recess portion 22 of the storage box 10, it is possible to achieve a motorcycle with slim body while maintaining maximum storage capacity of the storage box 10.

As shown in FIGs.8, 10a and 10b, again, to even further enhance securing the second connecting tube 28 and the arrangement of the canister 14 as a whole to the storage
15 box 10, in one embodiment, the canister mounting structure 8 further comprising a first securing means 38. In another embodiment, the canister mounting structure 8 further comprising a second securing means 40. The first securing means 38 and the second securing means 40 are designed to further secure the second connecting tube 28 to the wall of the recess portion 22 of the storage box 10.

20 The first securing means 38 is positioned proximity to the rear of the canister 14 or immediately after the backward curved section of the second connecting tube 28. The first securing means 38 is spaced-apart from the second securing means 40 and is comprising a holding wall 42 and a fixed screw 43 rotatably fixing a retaining plate 44 designed to engage with the holding wall 42 to restrain movement of the second connecting tube 28,
25 especially the portion of the second connecting tube 28 between the section behind the one-way valve 36 and the curved section. As an exemplary example, as shown in FIGs. 8-10a, the holding wall 42 is a two tongues holding wall comprising an upper section 41, a middle section 45 forming two lips, and a bottom section 47 and is preferably, integrally constructed onto the wall of the recess portion 22 of the storage box 10 during molding of
30 the storage box 10. The upper section 41 is prepared with a screw thread for receiving

engagement of the fixed screw 43 rotatably fixing the retaining plate 44 to the screw hole 49 of the holding wall 42. The middle section 45 of the holding wall 42 separates the upper section 41 from the bottom section 47 of the holding wall 42 and is positioned inward toward the wall of the recess portion 22 and give rise to a space having a width
5 corresponding to the circumference of the second connecting tube 28 and able to accommodate the designated section of the second connecting tube 28 therein. The bottom section 47 of the holding wall 42 further comprising a first tongue 46 and a second tongue 48. The height A of first tongue 46 is longer than the height B of the second tongue 48 such that the rotatable retaining plate 44 in a closed position abuts against the extended
10 section of the first tongue enclosing the designated section of the second connection tube 28 within the space between the upper section 41 and the bottom section 47 as illustrated in FIGs 10a and 10b.

The second securing means 40 is positioned away from the first securing means 38 downstream toward the front to the motorcycle 100. As illustrated in FIGs 7a-10a and 11a,
15 comprising a positioning member 50 and a support bar 52 operate in complementary to one another. The positioning member 50 is spaced-apart from the support bar 52 and is integrally formed with the wall of the recess portion 22 of the storage box 10, preferably right next to the location of the one-way valve 36 on the second connecting tube 28. The positioning member 50 is projected outwardly and includes an inward cutaway section 54
20 having a size corresponding to the circumference of the second connecting tube 28 such that the designated section of the second connecting tube 28 is able to be snugly fitted therein. As the cutaway section is narrower than the one-way valve, it's possible to prevent to move the one-way valve and the connecting tube in delivering direction. The support bar 52 is positioned away from the positioning member 50, but before the guide
25 wall 37. The support bar 52 is integrally formed with the wall of the recess portion 22 of the storage box 10 and outwardly project such that it is able to support a portion of the second connecting tube 28 between the positioning member 50 and the guide wall 37. As the support bar could support the second connecting tube from underneath, it's possible to prevent the slack of tube even delivering downwardly.

The first securing means 38, the second securing means 40 and the guide wall 37 are all designed and positioned to operate complementary to one another to secure and support the canister 14 and the second connecting tube 28 against the forward thrust and gravitational force as the vehicle is in motion. Preferably, the first securing means 38, the
5 second securing means 40 and the guide wall 37 are positioned in alignment to one another and form a single line alignment with the rear –upwardly direction of the second connecting tube 28 and the canister 14.

In embodiment, as shown in FIGs 7a, the canister mounting structure 8 according to the principle of the present invention further comprising a third securing means 56
10 comprising two spaced-apart elastic members 58 assembled to the canister 14, and two correspondingly spaced-apart hook members 60 which engage with the corresponding elastic member 58 on the canister 14. The elastic members 58 surrounding the circumference of the canister 14 wherein one elastic member locates around the rear section of the canister 14 while another elastic member around the front section of the
15 canister 14. The end of each elastic member 58 includes an opening 59 which engage with each of the corresponding hook member 60 positioned on the wall of the recess portion 22 of the storage box 10 as illustrated in detail in FIGs. 8, 13. The hook member 60 is projected outwardly and is integrally formed with the wall of the recess portion 22 of the storage box 10. The end of each of the hook member 60 is prepared with a protrusion 62a
20 and 62b designed for engaging in opposite direction with the opening 59 on the end of the elastic member 58 avoiding dismantling of the elastic member 58 from the hook member 60 once the end of the elastic member 58 is inserted through its opening to engage with the hook member 60. As the protrusion 62a and 62b are directed to different direction, it has much toughness for vibration to hold the canister. Preferably, to optimize the canister 14
25 weight distribution, the hook members are arranged in diagonal direction with the axis line of the canister as shown in FIG. 7b. By arranging the third securing means 56, i.e. the combination of the elastic member 58 and hook members 60 diagonally to the center line of the longitudinal direction of the canister it provides better and more secure arrangement of the canister 14 against vibration of the motorcycle 100.

As illustrated in FIG. 12, among others, the canister mounting structure 8 according to the present invention is preferably positioned within a pair of rear frame 68 of which connected to the main pipe 12 of the motorcycle 100 and run along each side of the motorcycle 100. Furthermore, the canister 14 is mounted in extent to the coverage of the rear cover 175, covering the side of fuel tank 16 also. The canister 14 is positioned within
5 the recess portion 22 of the storage box 10 and within the inner side of the rear frame 68. The rear frame 68 provides protection of the canister 14.

Also, it's possible to access the canister 14 and tube only by disassembling the rear cover.

10 In another embodiment, as shown in FIG. 13, the present invention disclosed an alternative arrangement of securing means for securing the second connecting tube 28, in particular, around the section whereby the second connecting tube 28 paralleled to the canister 14, to the wall of the recess portion 22 of the storage box 10. In this embodiment, the securing means is realized as a plurality of guide pins 64 strategically positioned at
15 various designated locations on the wall of the recess portion 22 of the storage box 10. Each of the guide pin 64 is outwardly projected and is integrally formed with the wall of the recess portion 22 of the storage box 10. The plurality of guide pins 64 are arranged as a combination of three, two and one guide pins 64 respectively. As an exemplary example, they are arranged in varying locations toward the front direction of the vehicle and are
20 collectively located in the same collective locations as with the holding wall 42, the positioning member 50 and the support bar 52 respectively, as previously described in earlier embodiments. More specifically, three guide pins 64 are located at the onset of the backward curved section of the second connecting tube 28. Among this group of three guide pins 64, two spaced-apart guide pins 64 are positioned on one side and one guide pin
25 64 is positioned away from the first two, on the opposing side of the second connecting tubes which is inserted between them. While the combination of two guide pins 64 operates similarly to the positioning member 50 are located right after the one-way valve 36 as with the positioning member 50. Among this two guide pins 64, each of them is positioned spaced-part in an opposing direction to one another. The space between them
30 accommodates the second connecting tube 28 fitted therein. The remaining one guide pin

64 operates in the same manner as with the support bar 52 as described in the earlier embodiment. That is, this single guide pin 64 is positioned away from the two guide pin 64 combination, but before the guide wall 37. This single guide pin 64 is positioned right under the second connecting tube 28 such that the second connecting tube 28 is supported thereon.

As it is apparent from the above teaching, by providing alternative canister mounting structures according to the principle of the present invention and its various embodiments, it is possible to efficiently and effectively mounts the canister to the storage box while maintaining maximum storage space of the storage box and without making the storage box and the body cover widen to the side of the motorcycle, as set out in the objective of the invention described above.

Although specific embodiments of the invention have been disclosed and described as well as illustrated in the accompanying drawings, it is simply for the purpose of better understanding of the principle of the present invention and it is not as a limitation of the scope and spirit of the teaching of the present invention. Adaption and medication to various embodiments are possible and apparent to a skilled person without departing from the scope of the present invention which is to be determined by the claims.

List of reference:

- 8 canister mounting structure
- 10 storage box
- 12 main pipe
- 14 canister
- 15 canister axis line
- 16 fuel tank
- 17 fuel receiving inlet
- 18 intake system
- 19 fuel line
- 20 battery
- 21 battery cover

- 21a, 21b battery terminals
- 22 recess portion (of the storage box)
- 24 first connecting tube
- 26 fuel separator
- 5 28 second connecting tube
- 30 guide means
- 32 guide hole (of guide means)
- 34 guide groove (of guide means)
- 36 one-way valve
- 10 37 guide wall
- 38 first securing means (combination of holding wall 42 retaining plate 44)
- 40 second securing means (combination of positioning member 50 and support bar 52)
- 41 upper section of holding wall
- 42 holding wall
- 15 43 fixed screw
- 44 retaining plate
- 45 middle section of holding wall
- 46 first tongue
- 47 bottom section of holding wall
- 20 48 second tongue
- 49 screw hole
- 50 positioning member
- 52 support bar
- 54 cut away section (of the positioning member)
- 25 56 third securing means (combination of elastic member on the canister and the hook member)
- 58 elastic member
- 59 opening (of the elastic member)
- 60 hook member

- 62, 62a protrusion (on the hook member)
- 64 guide pin
- 67 crank shaft
- 68 rear frame
- 5 71 fuel sensor unit
- 100 motorcycle
- 105 handle
- 106 head pipe
- 110 head light
- 10 111 winker lights
- 115 head light cover
- 120 front handle cover
- 125 rear handle cover
- 130 front cover
- 15 135 front fork
- 140 front wheel
- 145 front axle
- 150 front tire
- 155 drum brake
- 20 160 main pipe cover
- 161 front fender
- 162 front side cover
- 165 leg shield
- 170 seat sides cover
- 25 175 rear sides cover
- 180 combination of tail light
- 185 rear suspension
- 190 rear wheel
- 191 rear tire
- 30 195 rear axle

- 200, 200" chain case
- 205 swing arm
- 210 swing arm pivot portion
- 214 step for rider
- 5 215 passenger step holder
- 220a engine hunger portion
- 225 engine cylinder
- 226 cylinder axis line
- 230 cylinder head
- 10 235 crank case
- 240 drive axle
- 245 camshaft axle
- 250 crank axle
- 255 starting motor
- 15 265 intake manifold
- 270 carburetor
- 275 air cleaner
- 280 muffler

CLAIMS

We claim:

1. A canister mounting structure (8) for a motorcycle (100) comprising:
a storage box (10) mounting under a seat (9) of the motorcycle;
5 a canister (14) mounted in a recess portion (22) of said storage box (10) and
communicably connected to a fuel tank (16) and an engine intake system (18) so as to
collect vaporized fuel;
characterized in that
said storage box (10) storing a battery (20) therein and comprising said recess
10 portion (22) formed externally to a side surface of said storage box (10) and is overlapping
with said battery (20); and wherein said canister (14) is mounted in the rear-upwardly
manner inside said recess portion (22) of the said storage box (10).
2. The canister mounting structure (8) according to claim 1, wherein said canister
(14) connected a one-way valve (36) which is mounted in said recess portion (22) and
15 aligned parallel and close to said canister (14).
3. The canister mounting structure (8) according to claim 2, wherein said one-way
valve (36) is disposed above said canister (14).
4. The canister mounting structure (8) according to claims 1, wherein said canister
(14) connected to said fuel tank (16) and said engine intake system (18) by a first
20 connecting tube (24) and a second connecting tube (28) respectively; and said fuel tank is
mounted under said seat (9) and behind said storage box (10) and said first connecting tube
(24) and said second connecting tube (28) are connected to said canister (14) at its upper
rear end.
5. The canister mounting structure (8) according to claim 4, wherein said first
25 connecting tube (24) is wiring to said canister (14) and said fuel tank (16) by a guide
means (30) formed behind said storage box (10).
6. The canister mounting structure (8) according to claim 5, wherein said guide
means (30) comprising a guide hole (32) and a guide groove (34) prepared on the side of
the rear portion of said storage box (10); wherein said guide hole (32) is opened on the

upper surface of said storage box(10) and said guide groove is opened on rear surface of said storage box(10), so as to receive said first connecting tube(24) inserted there through.

7. The canister mounting structure (8) according to claim 4, wherein said second connecting tube (28) is secured to said recess portion (22) of said storage box (10) by a guide wall (37); said guide wall (37) projected downward restricting said second connecting tube (28) from protruding outward of said recess portion (22).

8. The canister mounting structure (8) according to claim 4, wherein the canister mounting structure further comprising;

said second connecting tube (28) is connected to said one-way valve (36) through a curving portion curved from said upper rear end of said canister (14) to forward of motorcycle and,

a first securing means (38) formed within said recess portion (22) of said storage box (10), and configured to secure said second connecting tube (28) on said curving portion to the said recess portion (22) of said storage box (10).

9. The canister mounting structure (8) according to claim 8, wherein said first securing means (38) comprising a holding wall (42) and a fixed screw (43) rotatably fixing a retaining plate (44), said retaining plate (44) is fixed to said holding wall (42) and retain a portion of said second connecting tube (28) inserted within a middle section (45) of said holding wall (42).

10. The canister mounting structure (8) according to claim 4, wherein said canister mounting structure further comprising a second securing means (40) formed between said one-way valve (36) and said engine intake system (18) within said recess portion (22) of said storage box (10) and configured to limit the moving of wiring direction of said second connecting tube (28) in said recess portion (22) of said storage box (10).

11. The canister mounting structure (8) according to claim 10, wherein said second securing means (40) comprising a positioning member (50) and a support bar (52); said positioning member (50) is spaced-apart from said support bar (52) and next to said one-way valve (36), and includes a cut away section (54) having a size corresponding to the circumference of said second connecting tube (28) such that it permits the designated section of said second connecting tube (28) to be snugly fitted therein; said support bar

(52) supports the downstream section of said second connecting tube (28) before the guide wall (37).

12. The canister mounting structure (8) according to claim 1, wherein said canister mounting structure comprising a third securing means (56) comprising a pair of spaced-apart elastic members (58) and a pair of spaced-apart hook member (60); said pair of the
5 elastic members (58) surrounding said canister (14) around the front section and the rear section of said canister (14); each of said elastic member (58) includes an opening (59) to be hooked onto a protrusion (62) prepared on each of said hook member (58) formed on the wall of said recess portion (22) of said storage box (10).

10 13. The canister mounting structure (8) according to claim 12, wherein said pair of hook members (60) are arranged in diagonal direction with an axis line of said canister (14) from a side view.

14. The canister mounting structure (8) according to any one of claim 4, wherein said second connecting tube (28) is secured to the wall of said recess portion (22) of said
15 storage box (10) by a plurality of guide pins (64) formed within said recess portion (22) of said storage box (10).

15. The canister mounting structure (8) according to any one of the preceding claims, wherein said canister (14) is positioned within a said recess portion (22) of said storage box (10) and on an inner side of a pair of rear frame (68) which run along the side
20 of the motorcycle and extend upwardly from the low portion of said storage box (10) to rearward of said storage box (10).

16. The canister mounting structure (8) according to any one of the preceding claims, wherein the axis line (15) of said canister (14) is directed about to the center of crankshaft (67).

25 17. The canister mounting structure (8) according to any one of the preceding claims, wherein said battery (20) is positioned length-wise in said storage box (10) in manner that each terminal (21a, 21b) of said battery is aligned to front-rear direction; and wherein- said terminals (21) of said battery (20) are positioned on the opposing side of said canister (14).

AMENDED CLAIMS

received by the International Bureau on 09 June 2014 (09.06.14)

1. A canister mounting structure (8) for a motorcycle (100) comprising:
 - a storage box (10) mounting under a seat (9) of the motorcycle;
 - a canister (14) mounted in a recess portion (22) of said storage box (10) and communicably connected to a fuel tank (16) and an engine intake system (18) so as to collect vaporized fuel;characterized in that
 - the storage box (10) stored a battery (20) therein and comprising said recess portion (22) formed externally to a side surface of said storage box (10) and is overlapping with said battery (20); and wherein said canister (14) is mounted in the rear-upwardly manner inside said recess portion (22) of the storage box (10).
2. The canister mounting structure (8) according to claim 1, wherein said canister (14) connected a one-way valve (36) which is mounted in said recess portion (22) and aligned parallel and close to said canister (14).
3. The canister mounting structure (8) according to claim 2, wherein said one-way valve (36) is disposed above said canister (14).
4. The canister mounting structure (8) according to claim 1, wherein said canister (14) is connected to said fuel tank (16) and said engine intake system (18) by a first connecting tube (24) and a second connecting tube (28) respectively; and said fuel tank is mounted under said seat (9) and behind said storage box (10) and said first connecting tube (24) and said second connecting tube (28) are connected to said canister (14) at its upper rear end.
5. The canister mounting structure (8) according to claim 4, wherein said first connecting tube (24) is wired to said canister (14) and said fuel tank (16) by a guide means (30) formed behind said storage box (10).
6. The canister mounting structure (8) according to claim 5, wherein said guide means (30) comprising a guide hole (32) and a guide groove (34) prepared on the side of the rear portion of said storage box (10); wherein said guide hole (32) is opened on the upper surface of said storage box (10) and said guide groove is opened on rear surface of said storage box (10), so as to receive said first connecting tube (24) inserted there through.
7. The canister mounting structure (8) according to claim 4, wherein said second connecting tube (28) is secured to said recess portion (22) of said storage box (10) by a guide wall

(37); said guide wall (37) projected downward restricting said second connecting tube (28) from protruding outward of said recess portion (22).

8. The canister mounting structure (8) according to claim 4, wherein the canister mounting structure further comprising;

said second connecting tube (28) is connected to said one-way valve (36) through a curving portion curved from said upper rear end of said canister (14) to forward of motorcycle and,

a first securing means (38) formed within said recess portion (22) of said storage box (10), and configured to secure said second connecting tube (28) on said curving portion to the said recess portion (22) of said storage box (10).

9. The canister mounting structure (8) according to claim 8, wherein said first securing means (38) comprising a holding wall (42) and a fixed screw (43) rotatably fixing a retaining plate (44), said retaining plate (44) is fixed to said holding wall (42) and retain a portion of said second connecting tube (28) inserted within a middle section (45) of said holding wall (42).
10. The canister mounting structure (8) according to claim 4, wherein said canister mounting structure further comprising a second securing means (40) formed between said one-way valve (36) and said engine intake system (18) within said recess portion (22) of said storage box (10) and configured to limit the moving of wiring direction of said second connecting tube (28) in said recess portion (22) of said storage box (10).
11. The canister mounting structure (8) according to claim 10, wherein said second securing means (40) comprising a positioning member (50) and a support bar (52); said positioning member (50) is spaced-apart from said support bar (52) and next to said one-way valve (36), and includes a cut away section (54) having a size corresponding to the circumference of said second connecting tube (28) such that it permits the designated section of said second connecting tube (28) to be snugly fitted therein; said support bar (52) supports the downstream section of said second connecting tube (28) before the guide wall (37).
12. The canister mounting structure (8) according to claim 1, wherein said canister mounting structure comprising a third securing means (56) comprising a pair of spaced-apart elastic members (58) and a pair of spaced-apart hook member (60); said pair of the elastic members (58) surrounding said canister (14) around the front section and the rear section of said canister (14); each of said elastic member (58) includes an opening (59) to be

hooked onto a protrusion (62) prepared on each of said hook member (58) formed on the wall of said recess portion (22) of said storage box (10).

13. The canister mounting structure (8) according to claim 12, wherein said pair of hook members (60) are arranged in diagonal direction with an axis line (15) of said canister (14) from a side view.
14. The canister mounting structure (8) according to any one of claims 1 to 13, wherein said second connecting tube (28) is secured to the wall of said recess portion (22) of said storage box (10) by a plurality of guide pins (64) formed within said recess portion (22) of said storage box (10).
15. The canister mounting structure (8) according to any one of the preceding claims, wherein said canister (14) is positioned within said recess portion (22) of said storage box (10) and on an inner side of a pair of rear frame (68) which run along the side of the motorcycle and extend upwardly from the low portion of said storage box (10) to rearward of said storage box (10).
16. The canister mounting structure (8) according to any one of the preceding claims, wherein the axis line (15) of said canister (14) is directed about to the center of a crankshaft (67).
17. The canister mounting structure (8) according to any one of the preceding claims, wherein said battery (20) is positioned length-wise in said storage box (10) in manner that each terminal (21a, 21b) of said battery is aligned to front-rear direction; and wherein said terminals (21) of said battery (20) are positioned on the opposing side of said canister (14).

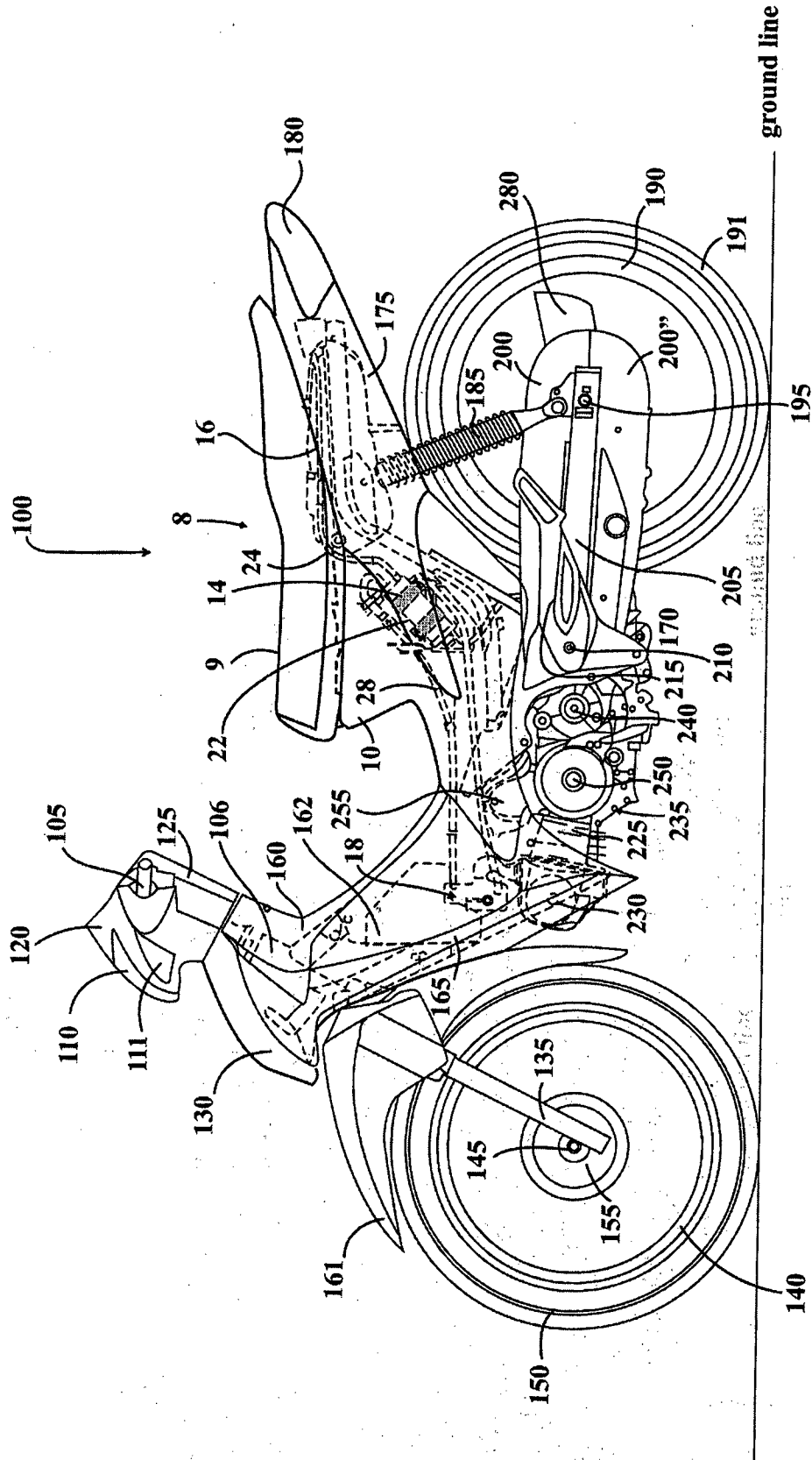


FIG. 1

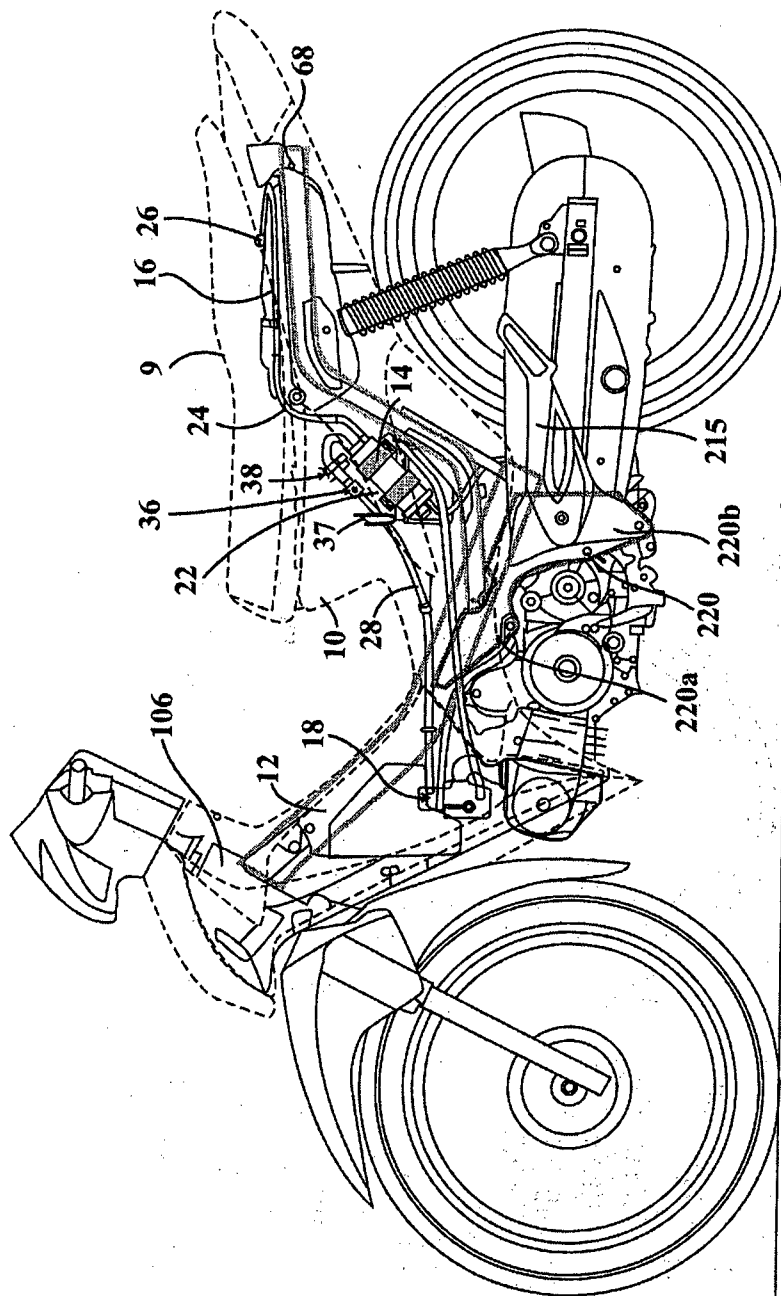


FIG. 2

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FIG. 3

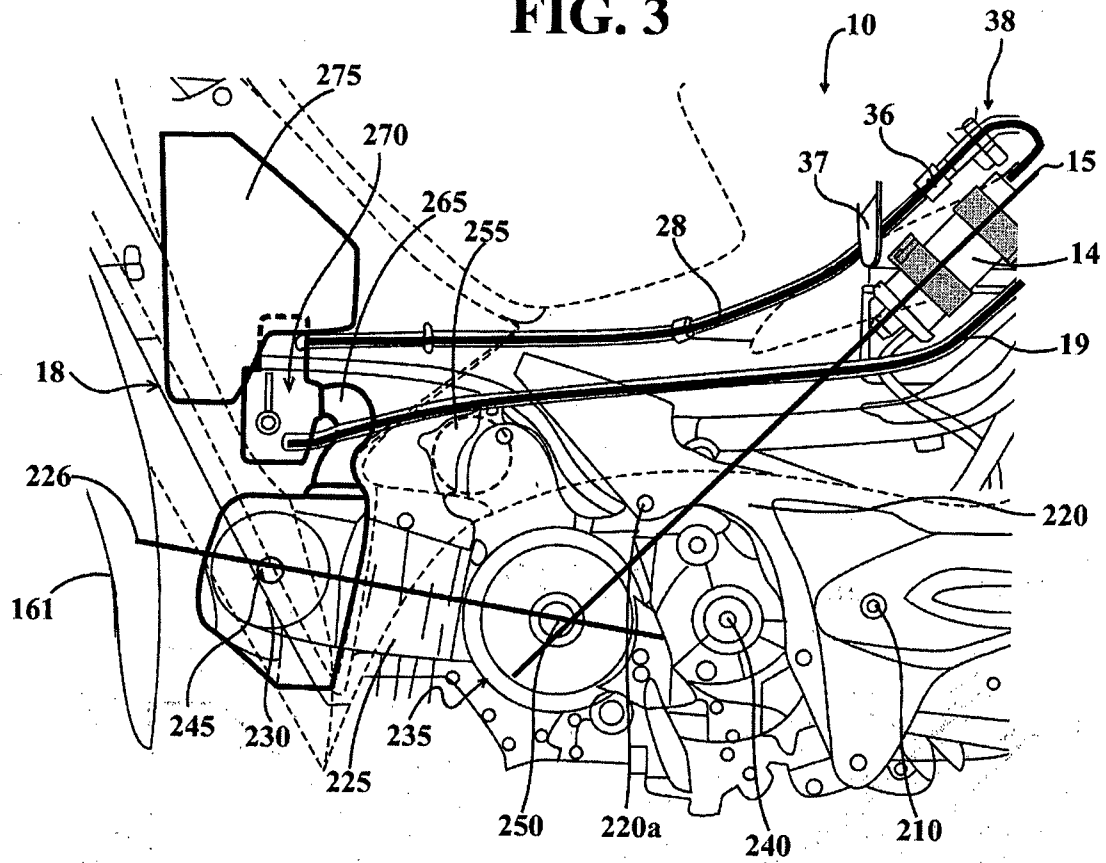
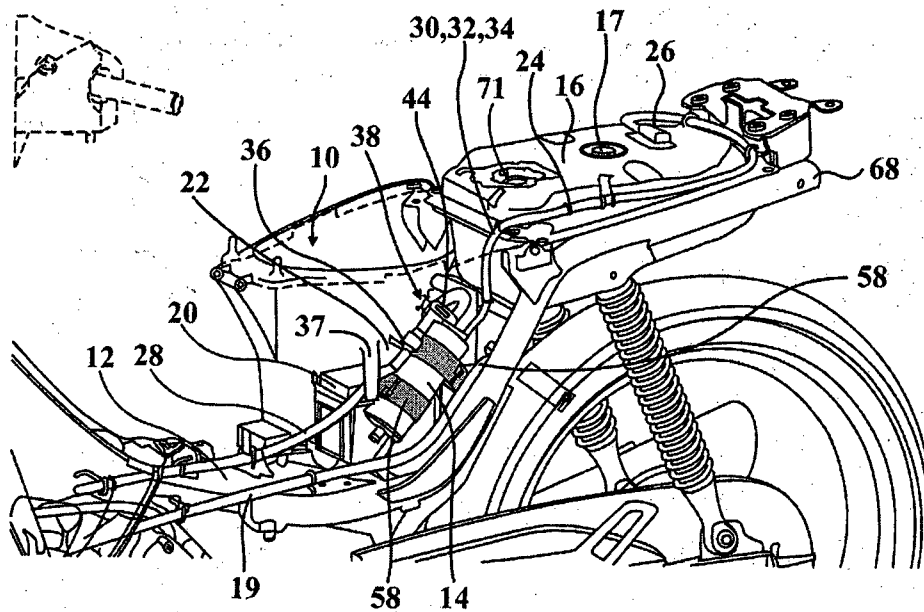
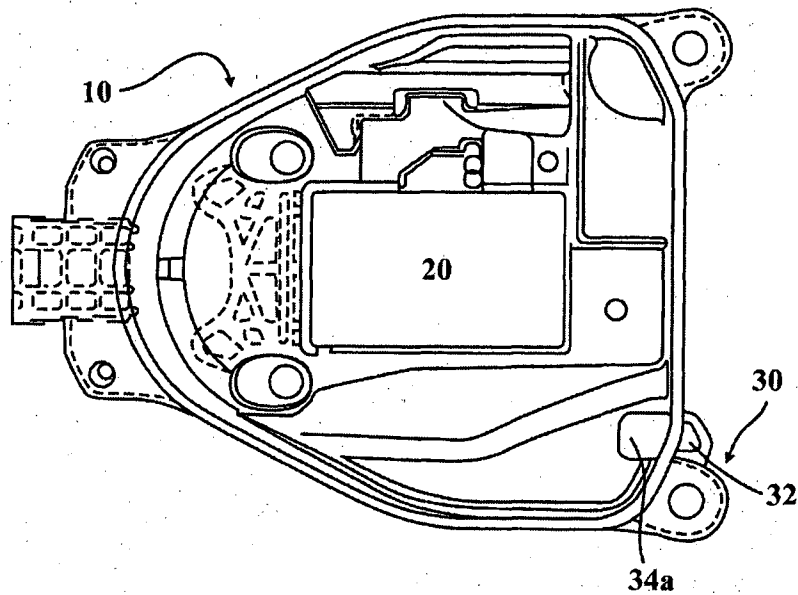
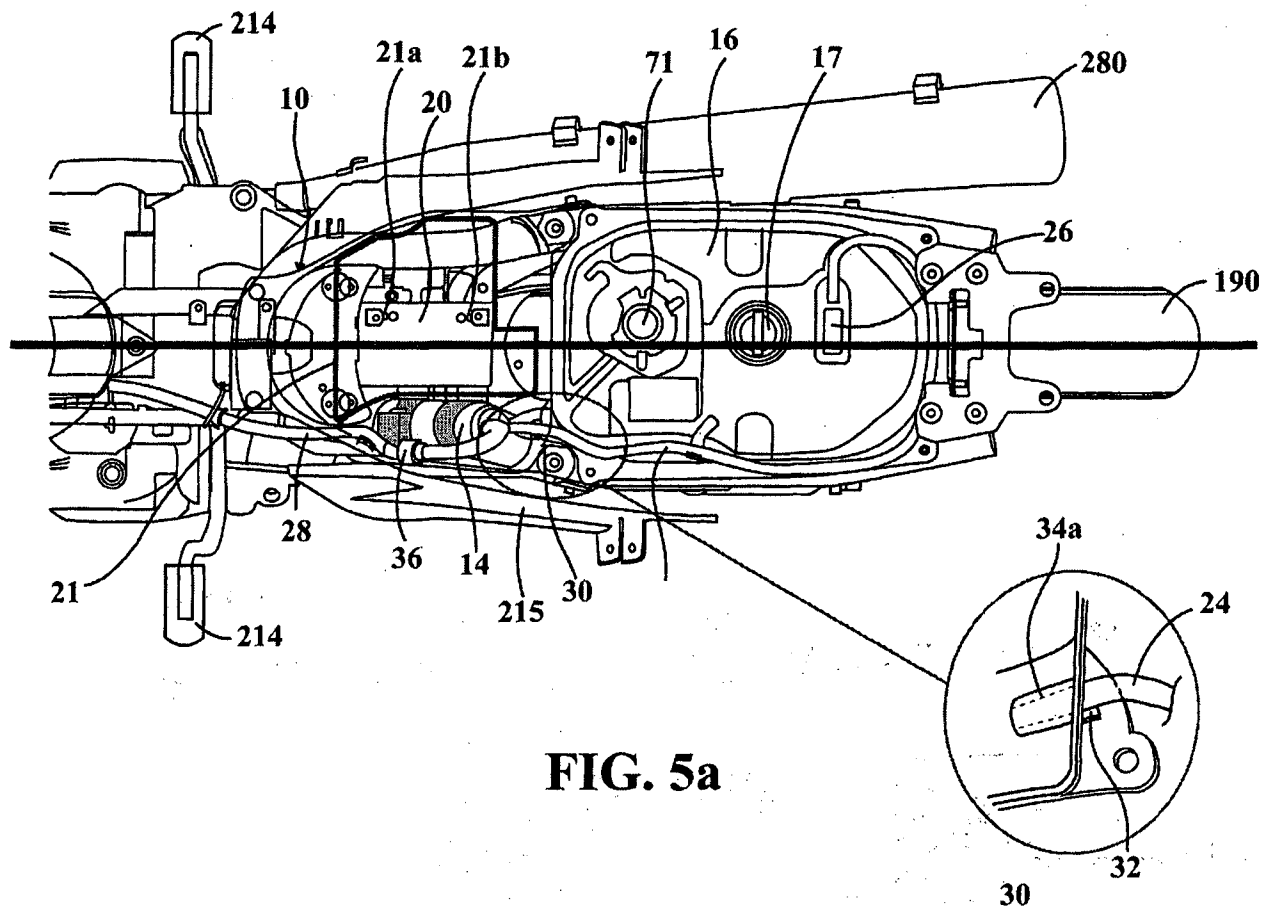


FIG. 4



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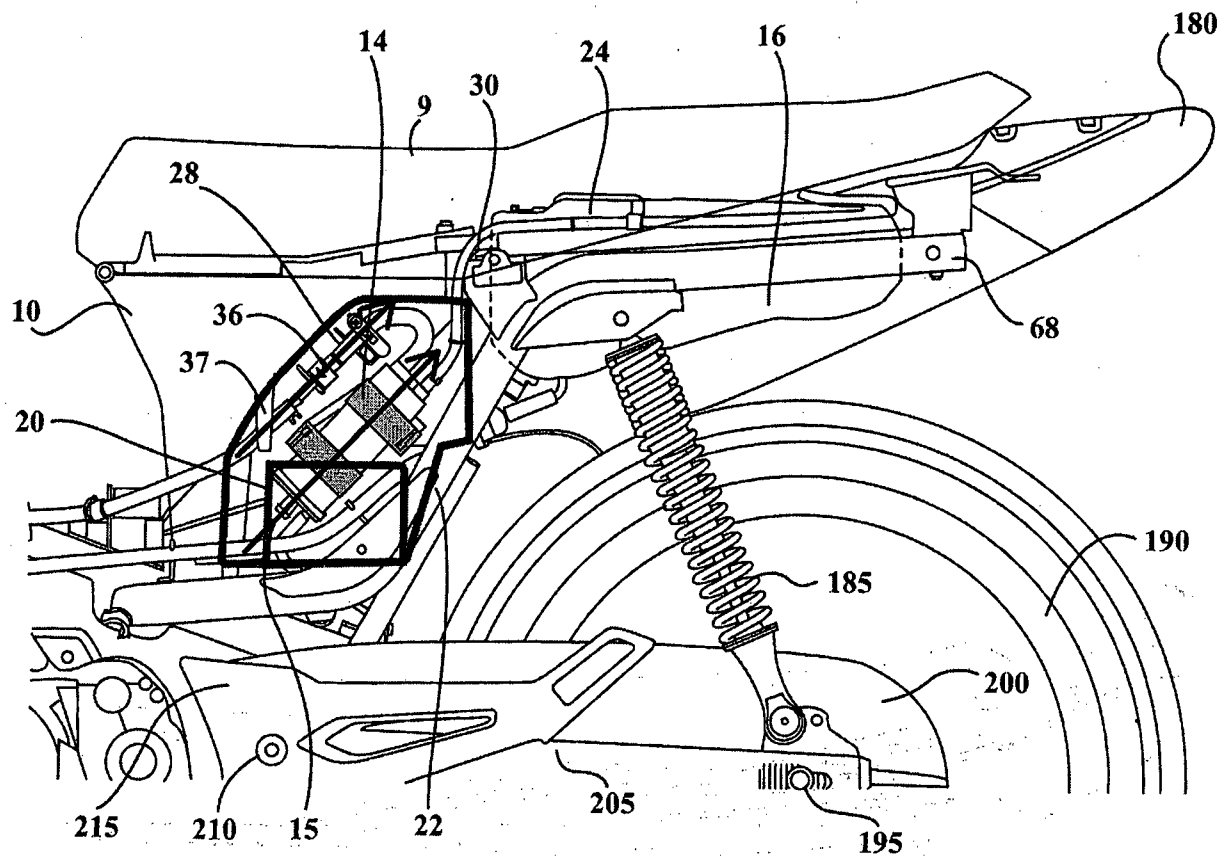


FIG. 6

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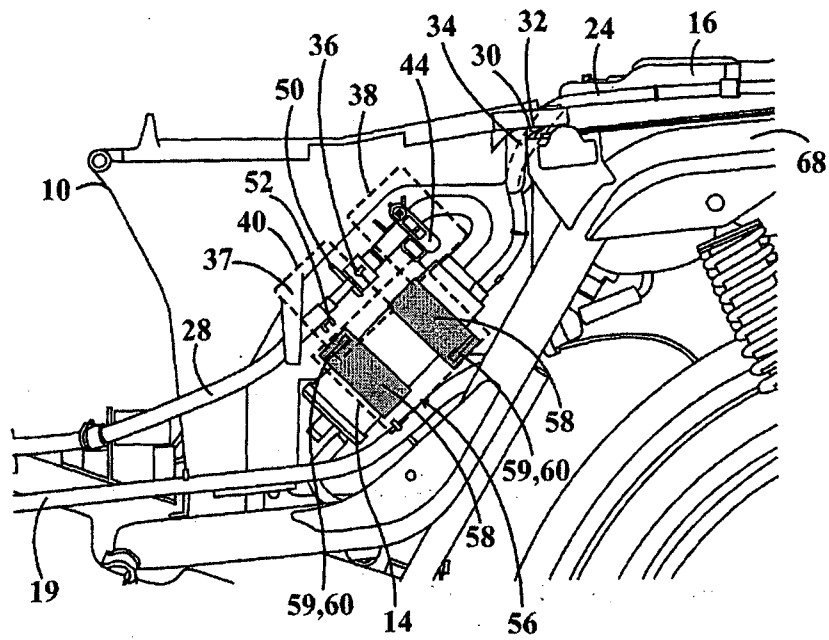


FIG. 7a

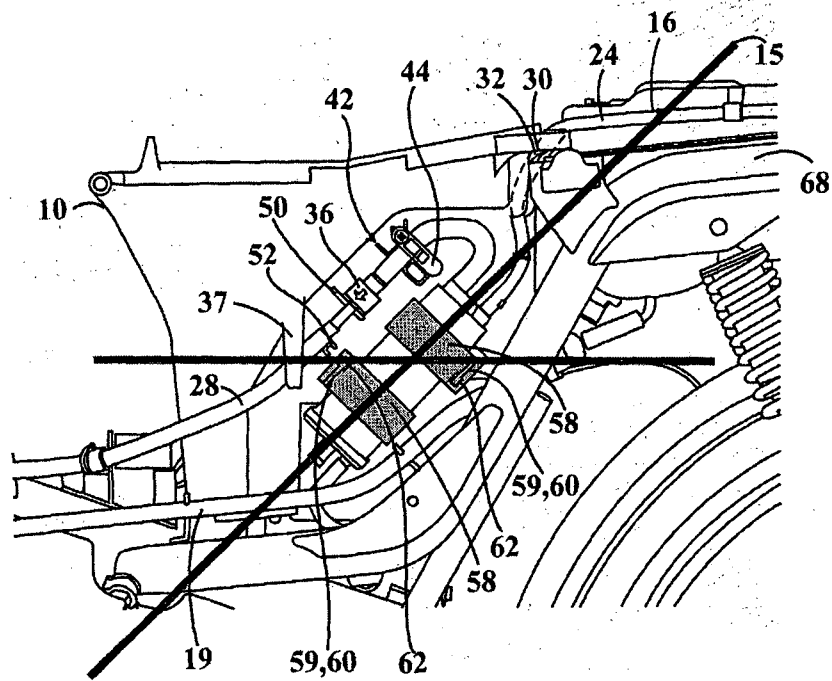


FIG. 7b

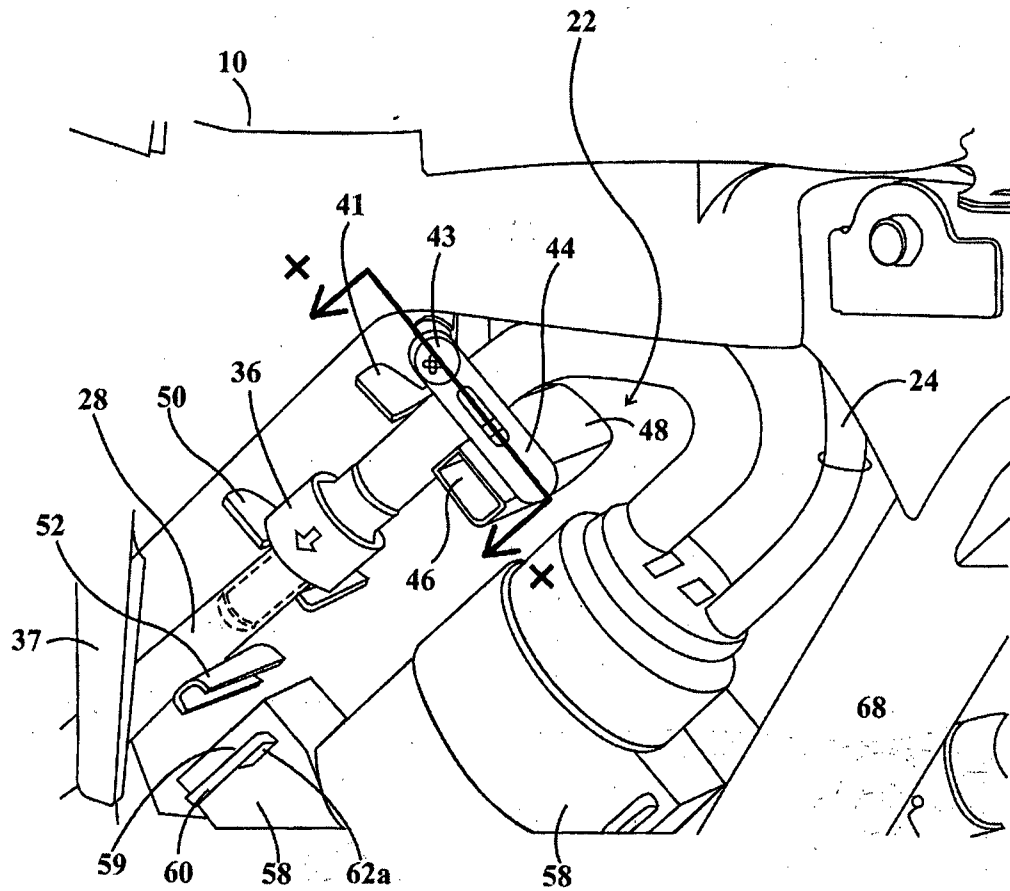


FIG. 8

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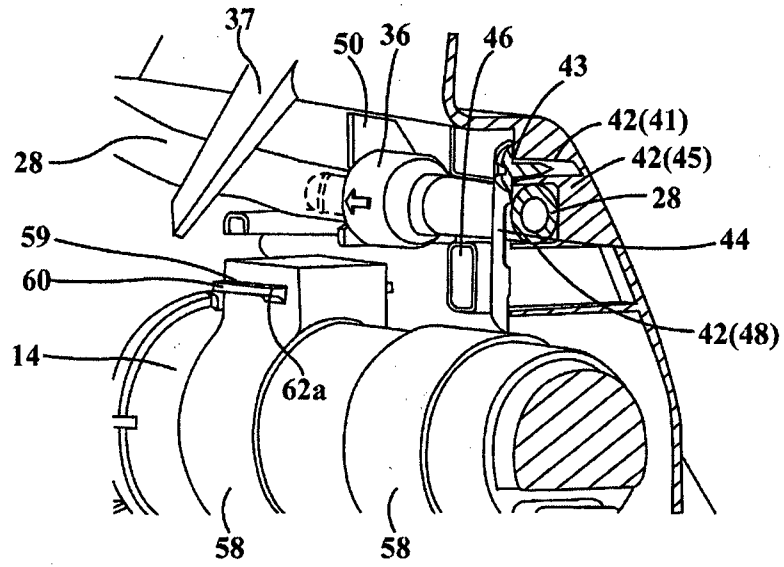


FIG. 9a

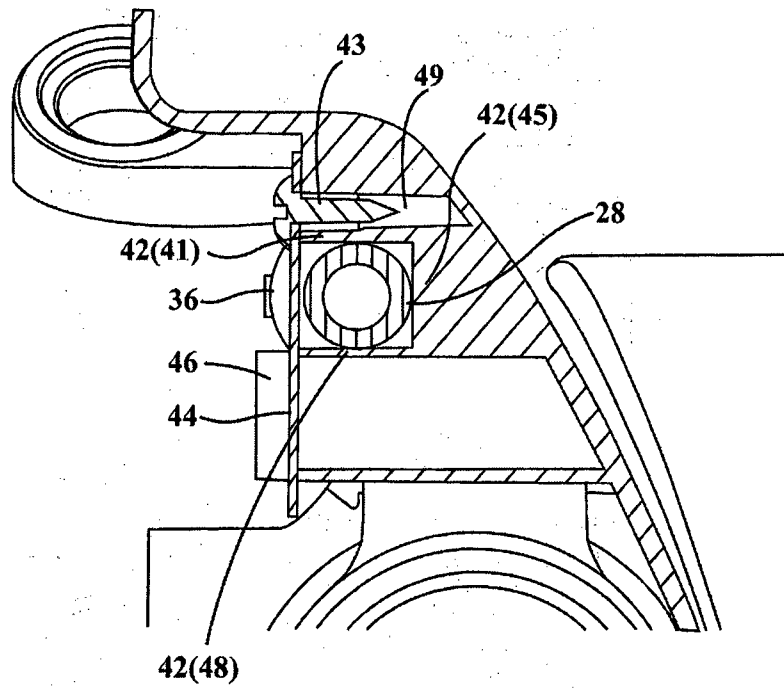


FIG. 9b

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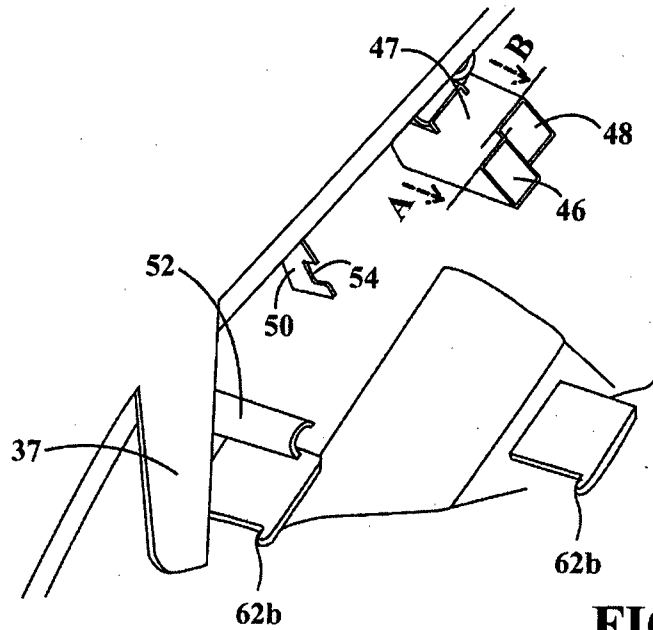


FIG. 10b

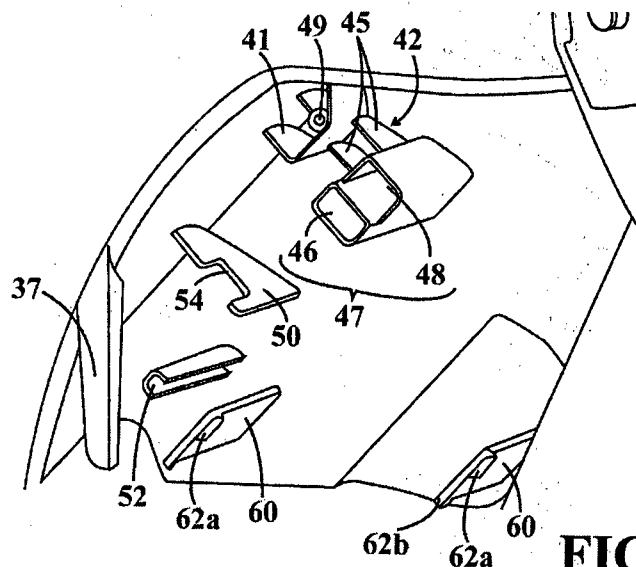


FIG. 10a

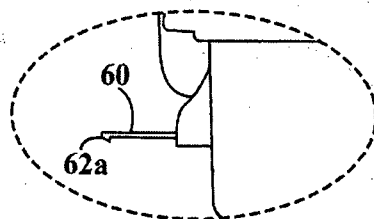


FIG. 10c

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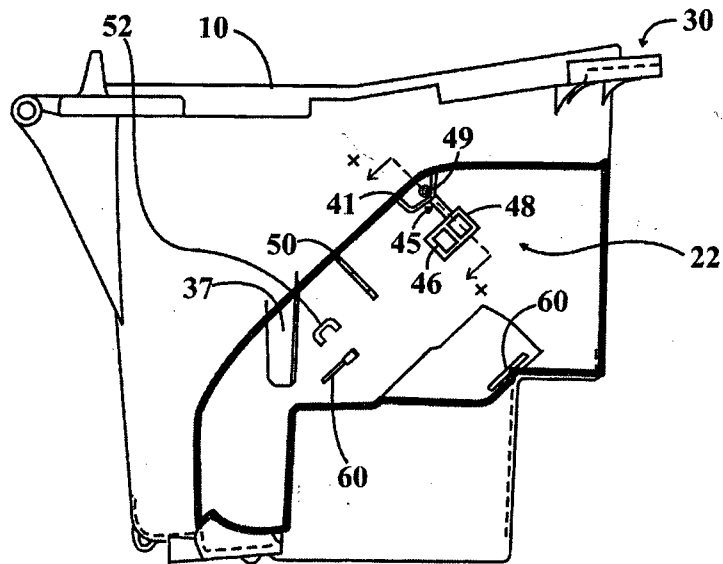


FIG. 11a

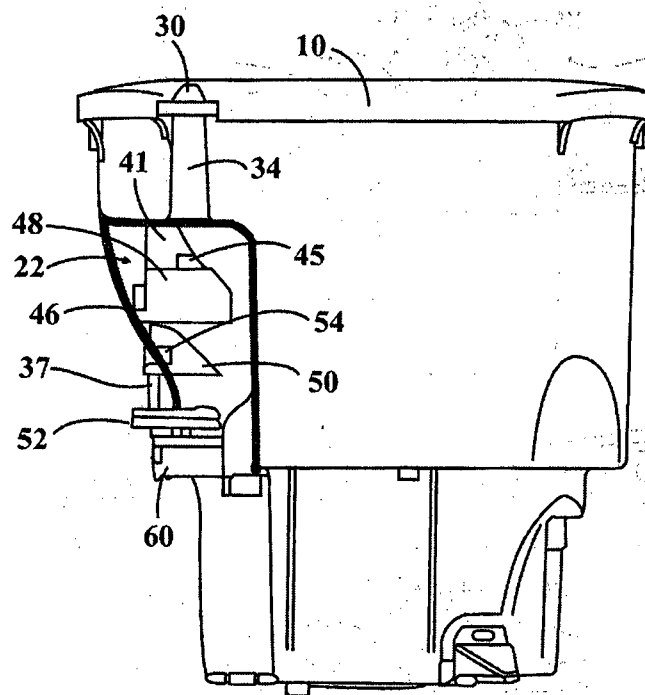


FIG. 11b

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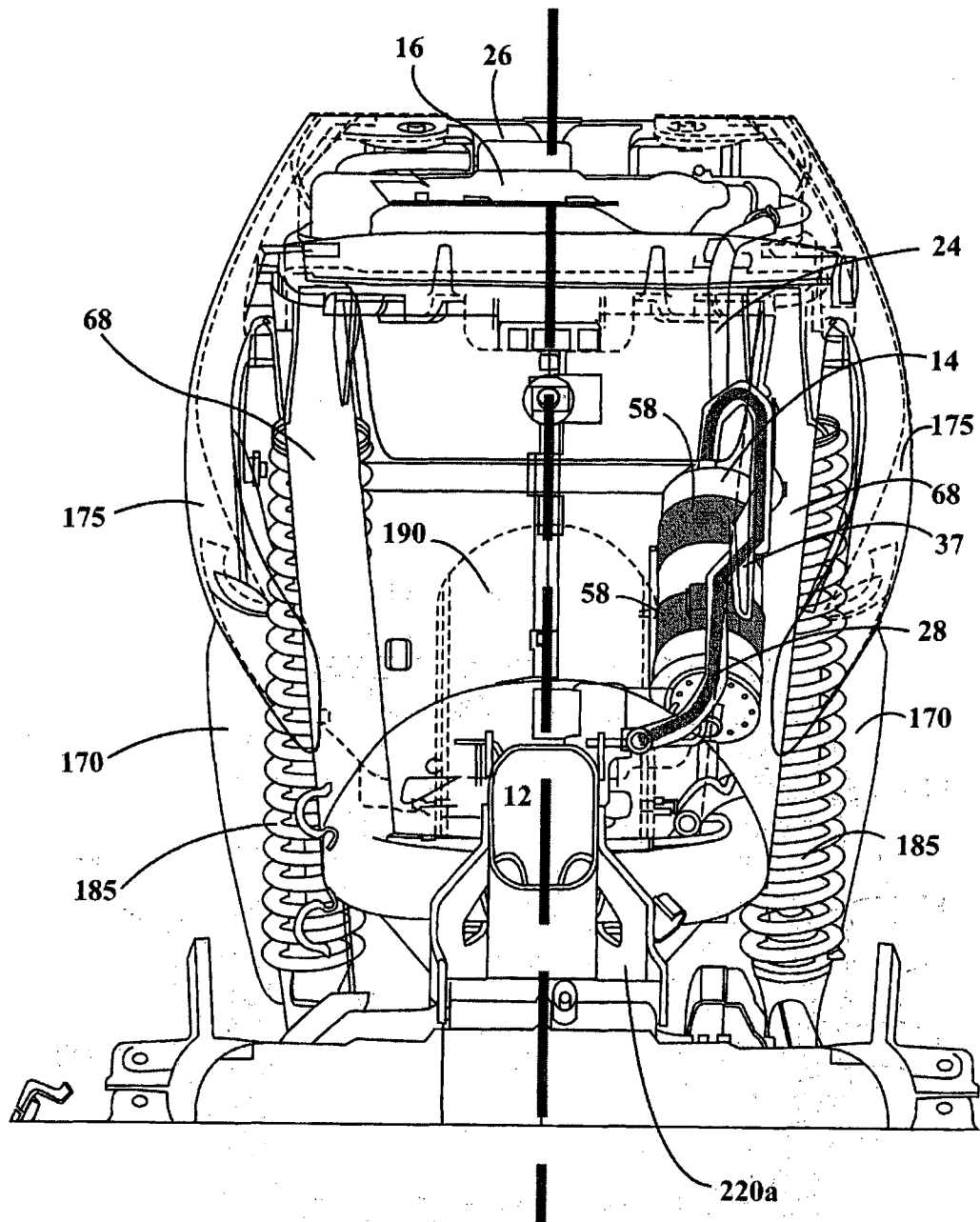


FIG. 12

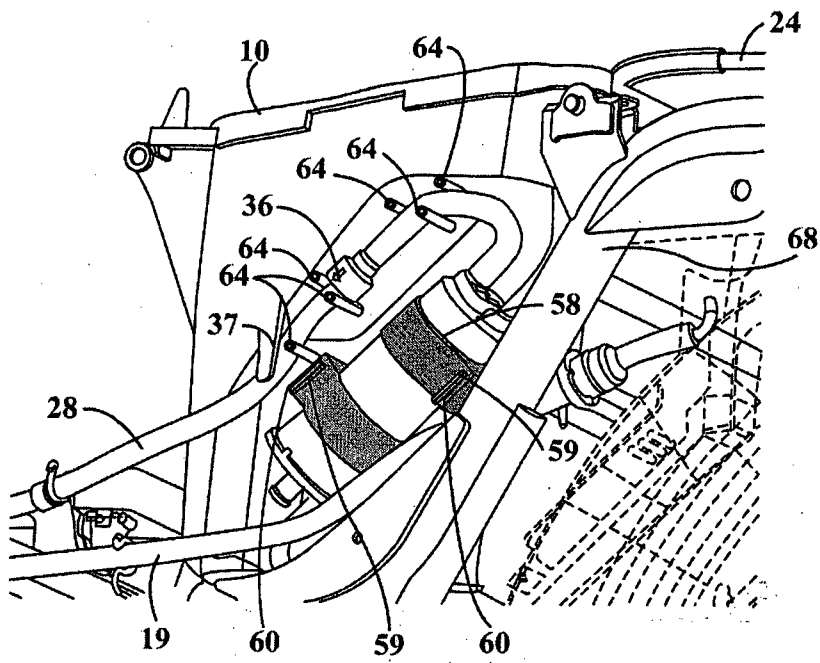


FIG. 13

INTERNATIONAL SEARCH REPORT

International application No.

PCT/TH2013/000002

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl. B62J37/00 (2006.01) i, B62J9/00 (2006.01) i

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)

Int.Cl. B62J37/00, B62J9/00

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

Published examined utility model applications of Japan 1922-1996
 Published unexamined utility model applications of Japan 1971-2013
 Registered utility model specifications of Japan 1996-2013
 Published registered utility model applications of Japan 1994-2013

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 10-324281 A (HONDA MOTOR CO., LTD.) 1998.12.08, Figs, 3-4 (No Family)	1-17
A	JP 2010-155506 A (HONDA MOTOR CO., LTD.) 2010.07.15, Figs 1-5 & US 2010/0163328 A1 & EP 2206910 A1 & CN 101767622 A & AT 552418 T & ES 2381925 T	1-17
A	JP 2005-112310 A (HONDA MOTOR CO., LTD.) 2005.04.28, Figs. 3, 5 & US 2005/0098596 A1 & DE 102004048479 A & BR 405768 A & TW 260292 B & CN 1605529 A & BRA PI0405768 & IT TO20040667 A & IT TO20040667 A1	1-17
A	Microfilm of the specification and drawings	1-17

☒ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

04.06.2013

Date of mailing of the international search report

18.06.2013

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3D 4853

INTERNATIONAL SEARCH REPORT

International application No.

PCT/TH2013/000002

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	annexed to the written application of Japanese Utility Model Application No.093953/1980 (Laid-open No.017891/1982) (HONDA MOTOR CO., LTD.) 1982.01.29, Fig.1 (No Family)	